



# CITY ENGINEERING COLLEGE

Approved by AICTE New Delhi & Affiliated by VTU, Belagavi  
Doddakallasandra, Off Kanakapura Main Road,  
Next to Gokulam Apartment, Bangalore - 560 062.



## DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

### CIRCULAR

RefNo: CEC/AIML/DAC/ACY 2023-2024/02

Date: 12-02-2024

This is to inform the members of Department Advisory Committee that meeting is scheduled on 16-02-2024 at 11: 00 AM in HOD's office AIML Department.

#### Agenda:

- Organize hackathons, project exhibitions.
- Invite industry experts for guest lectures.
- Incorporate more hands-on lab sessions and practical training.
- Establish partnerships with companies for internships.
- Encourage faculty and students to publish research papers.
- Promote participation in cultural and sports events.

CC TO

1. PRINCIPAL OFFICE-CEC
2. All Members

*Vogdus*

**HOD**  
**HOD**

Dept of Artificial Intelligence & Machine Learning  
CITY ENGINEERING COLLEGE  
Doddakallasandra, (Off) Kanakapura Road,  
Bangalore-560061



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## DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

### Department Advisory Committee Meeting

**Date:** 16/02/2024

**Time:** 11:00 AM

**Venue:** HOD's office

DAC Members Present:

Sl. No	Member Name	Designation	Role	Signature
1	Dr. S Vagdevi	HOD	Convenor, HOD	
2	Mr. Subhash Murugesan	Founder, Aero knotz Drones India Private Limited	Industry Expert	
3	Dr. Prakash S	Associate Professor, Department of ISE,RNSIT.	Member	
4	Mrs. Vindhya R	Assistant Professor	Member	
5	Mr. Mahesh Basavaraj	Assistant Professor	Member	

The Department Advisory Committee meeting was conducted in Department of AIML, on 16<sup>th</sup> February, 2024, at 11 AM.

#### Agenda of the Meeting:

- Organize hackathons, project exhibitions.
- Invite industry experts for guest lectures.
- Incorporate more hands-on lab sessions and practical training.
- Establish partnerships with companies for internships.
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## Minutes of Meeting:

During the Department Advisory Committee meeting, an overview of the department was provided, showcasing student achievement, and faculty and contributions. The members discussed suggestions for improvement and reviewed the meeting agenda.

The following points were discussed in the meeting:

- Proposal to schedule regular hackathons and project exhibitions.
- Aim to foster innovation and hands-on experience among students.
- Importance of inviting judges from academia and industry emphasized.
- Importance of bridging academic learning and industry practices.
- Importance of developing formal internship agreements with companies.


*Vagdevi*

[Dr. S Vagdevi]

HOD

HOD

Dept of Artificial Intelligence & Machine Learning  
CITY ENGINEERING COLLEGE  
Doddakallasandra, (Off) Kanakapura Road,  
Bangalore-560062

	CITY ENGINEERING COLLEGE, BENGALURU-560061. ACADEMIC CALENDAR 2023-24 (EVEN SEM)													
	FEB 2024		MARCH 2024		APRIL 2024		MAY 2024		JUNE 2024		JULY 2024		AUGUST 2024	
DAY	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT
MON					1	1 <sup>st</sup> to 25 <sup>th</sup> April 24 – Theory Examination – Vth Sem					1	1 <sup>st</sup> to 11 <sup>th</sup> July 24 Practical Exam II Sem B. E		
TUE					2						2	2 <sup>nd</sup> to 4 <sup>th</sup> July 24 Test I – IV Sem B. E		
WED					3		1	Holiday – May Day		VI Sem - Display of Ist IA Marks on NB and ERP Communication to parents	3	3 <sup>rd</sup> to 5 <sup>th</sup> July 24, II Test for VI Semester		
THU	1				4		2	Sports Day			4			1
FRI	2		1		5		3	Sports Day			5			2
SAT	3	1st Saturday Holiday	2	1st Saturday Holiday	6	1st Saturday Holiday	4	1st Saturday Holiday	1	1st Saturday Holiday	6	1st Saturday Holiday	3	1st Saturday Holiday
SUN	4		3		7		5		2		7		4	
MON	5		4		8		6		3	3 <sup>rd</sup> June to 20 <sup>th</sup> June 2024 Theory Examination of I Sem MBA/MCA/M. Tech	8		5	
TUE	6		5	5 <sup>th</sup> , 6 <sup>th</sup> , 7 <sup>th</sup> Mar 24 Test 2- III Sem, Test 3-V SEM	9	Holiday – Chandramana Ugadi	7	7 <sup>th</sup> May 24, 3 <sup>rd</sup> Test VIII Semester B. E	4		9		6	
WED	7		6	Commencement of Classes of II Sem B. E	10		8	Ethnic Day	5		10	IV Semester - Display of Ist Test IA Marks on NB and ERP Communication to parents	7	
THU	8		7		11	Holiday – Qutub-e-Ramzan	9	College Day	6		11	VI Sem - Display of 2 <sup>nd</sup> IA Marks on NB and ERP Communication to parents	8	
FRI	9		8	Holiday -Maha Shiva Ratri	12		10	Holiday – Basava Jayanthi	7		12		9	
SAT	10		9	Last Working Day of classes III Sem B. E	13	Alumni Meet	11	Last Working Day of the Semester VIII Sem B. E And Farewell for VIII Semester Students	8		13		10	
SUN	11		10		14		12		9		14		11	
MON	12	Commencement of Classes of I Sem MBA/MCA/M.Tech and VIII Sem B. E	11		15		13	13 <sup>th</sup> to 21 <sup>st</sup> May 24 Theory Examinations – VIII Sem B.E	10		15	15 <sup>th</sup> July to 10 <sup>th</sup> Aug 24- Theory Exam- II Sem B. E	12	
TUE	13	Industrial Visit – 8 <sup>th</sup> Sem (CS/IS/AIML), B.E	12		16	16 <sup>th</sup> to 18 <sup>th</sup> April 24, I-Test IInd Semester	14		11		16		13	
WED	14		13	13 <sup>th</sup> to 27 <sup>th</sup> Mar 24 Theory Examination -III Sem B. E	17		15		12		17	Holiday - Muharram	14	
THU	15		14		18		16		13		18		15	Holiday – Independence Day
FRI	16		15		19	MBA/MCA/M.Tech Industrial Visit	17		14		19		16	
SAT	17	3rd Saturday Holiday	16	3rd Saturday Holiday Last Working Day of classes V Sem B. E	20	3rd Saturday Holiday	18	3rd Saturday Holiday	15	3rd Saturday Holiday	20	3rd Saturday Holiday	17	3rd Saturday Holiday
SUN	18		17		21		19		16		21		18	
MON	19	Industrial Visit – 5 <sup>th</sup> Sem (CS/IS/AIML), B. E	18		22		20	Commencement of classes of IV Semester B. E	17	Holiday - Bakrid	22		19	Commencement of Classes III Sem B. E
TUE	20		19		23		21	III Test MBA/MCA/M.Tech	18	18 <sup>th</sup> to 20 <sup>th</sup> June 24, II- Test IInd Semester	23		20	20 <sup>th</sup> to 22 <sup>nd</sup> Aug 24 Test II – IV Sem B. E
WED	21		20	20 <sup>th</sup> to 30 <sup>th</sup> Mar 24 Practical Examination – Vth Sem B. E	24	Display of Ist Test IA Marks on NB and ERP Communication to parents	22		19		24		21	
THU	22		21		25	25 <sup>th</sup> to 27 <sup>th</sup> April 24, II Test MBA/MCA/M.Tech and 25 <sup>th</sup> April VIII Semester B. E	23	23 <sup>rd</sup> to 30 <sup>th</sup> May 24, Internship Viva-voce/Project Viva- VIII Semester	20		25		22	
FRI	23	23 <sup>rd</sup> Feb to 5 <sup>th</sup> Mar 2024 Practical Exam B.E I Sem B. E	22		26	“Battle of Science” for IInd Sem Students	24		21		26		23	
SAT	24		23	“Talents Day” for IInd Sem Students	27		25	Last Working Day of I Sem MBA/MCA/M. Tech	22	Graduation Day	27		24	
SUN	25		24		28		26		23		28		25	
MON	26		25	25 <sup>th</sup> to 27 <sup>th</sup> March 24, I Test MBA/MCA/M.Tech and 25 <sup>th</sup> March VIII Semester B. E	29	Commencement of Classes of VI Semester B. E	27	27 <sup>th</sup> to 31 <sup>st</sup> May 24 Practical Examination/Internship Viva Voce/Project Viva of I Sem MCA/ M. Tech	24		29		26	Display of 2 <sup>nd</sup> Test IA Marks on NB and ERP Communication to parents
TUE	27		26		30		28	28 <sup>th</sup> to 30 <sup>th</sup> MAY 24, I Test for VI Semester	25	Commencement of Classes of II Sem MBA/MCA/M.Tech	30	International Conference	27	
WED	28		27				29		26	Display of IInd IA Marks on NB and ERP Communication to parents	31	International Conference	28	

THU	29		28			30		27			29	
FRI			29	Holiday – Good Friday				31			28	PTM – IInd Semester
SAT			30	30 <sup>th</sup> Mar to 12 <sup>th</sup> April 24, Practical Examination – III Sem B. E							29	Last Working Day of The II Semester B. E
SUN			31								30	
Note: 1. Students Feedback should be taken immediately after the Test. 2. There will be no additional circular will be sent for dates mentioned for Events in CoE												

CITY ENGINEERING COLLEGE, BENGALURU-560061. ACADEMIC CALENDAR 2023-24 AIML Department (EVEN SEM)														
FEB 2024		MARCH 2024		APRIL 2024		MAY 2024		JUNE 2024		JULY 2024		AUGUST 2024		
DAY	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	
MON					1	1 <sup>st</sup> to 25 <sup>th</sup> April 24 – Theory Examination – Vth Sem				1	1 <sup>st</sup> to 11 <sup>th</sup> July 24 Practical Exam II Sem B. E			
TUE					2	2 <sup>nd</sup> to 4 <sup>th</sup> March 24, I Test MCA				2				
WED					3		1	Holiday – May Day		3	3 <sup>rd</sup> to 5 <sup>th</sup> July 24- B.E - VI SEM IA2			
THU	1	Hands on workshop V sem			4		2	Sports Day, Industrial Visit		4		1	IV Semester -Display of 2 <sup>nd</sup> IA Marks on NB and ERP Communication to parents	
FRI	2	Hands on workshop V sem	1		5		3	Generative AI 3 <sup>rd</sup> to 9 <sup>th</sup>		5		2	PTM – IVth Semester	
SAT	3	1st Saturday Holiday	2	1st Saturday Holiday	6	1st Saturday Holiday	4	1st Saturday Holiday	1	1st Saturday Holiday	6	1st Saturday Holiday	3	1st Saturday Holiday
SUN	4		3		7		5		2		7		4	
MON	5	Hands on workshop V sem	4		8		6		3		8		5	
TUE	6	Hands on workshop V sem	5	5 <sup>th</sup> , 6 <sup>th</sup> , 7 <sup>th</sup> Mar 24 , Test 2- III Sem, Test 3-V SEM (3C)	9	Holiday – Chandramana Ugadi	7	7 <sup>th</sup> May 24, 3 <sup>rd</sup> Test VIII Semester B. E	4		9		6	
WED	7	Hands on workshop V sem	6	Commencement of Classes of II Sem B. E	10	Display of 1st Test IA Marks of MBA/MCA/M.Tech and 8 <sup>th</sup> Sem on NB and ERP Communication to parents	8		5		10		7	Last Working Day of the semester IV Semester
THU	8		7		11	Holiday – Qutub-e-Ramzan	9		6	6 <sup>th</sup> to 8 <sup>th</sup> JUNE 24 Test I – IV Sem B. E and VI SEM B.E	11		8	8 <sup>th</sup> to 17 <sup>th</sup> Aug 24, IVth Semester Practical Examination
FRI	9		8	Holiday -Maha Shiva Ratri	12		10	Holiday – Basava Jayanthi	7		12	VI SEM - Display of II Test IA Marks on NB and ERP Communication to parents	9	
SAT	10		9	Last Working Day of classes III Sem B. E	13		11	Last Working Day of the Semester VIII Sem B. E And Farewell for VIII Semester Students	8	Last Working Day of I Sem MBA/MCA/M. Tech	13		10	VI SEM – 1/08/24 to 10/08/24 Practical/Viva/internship Viva
SUN	11		10		14		12		9		14		11	
MON	12	Commencement of Classes of VIII Sem B. E	11		15		13	13 <sup>th</sup> to 21 <sup>st</sup> May 24 Theory Examinations – VIII Sem B.E	10		15	15 <sup>th</sup> July to 10 <sup>th</sup> Aug 24- Theory Exam- II Sem B.	12	VI SEM – 12/08/24 to 14/09/24 Theory Examination
TUE	13	Industrial Visit – 8 <sup>th</sup> Sem (CS/IS/AIML), B.E	12		16		14		11		16		13	
WED	14		13	13 <sup>th</sup> to 27 <sup>th</sup> Mar 24 Practical Examination -III Sem B. E	17		15	15 <sup>th</sup> to 17 <sup>th</sup> May 24, I-Test IInd Semester, Technical talk	12		17	Holiday - Muharram	14	
THU	15		14		18		16		13		18		15	Holiday – Independence Day
FRI	16		15	Women's Day Celebrations and "Talents Day" for IInd Sem Students	19	MBA/MCA/M.Tech Industrial Visit	17		14	IV Semester and VI semester - Display of I Test IA Marks on NB and ERP Communication to parents	19		16	
SAT	17	3rd Saturday Holiday	16	3rd Saturday Holiday Last Working Day of classes V Sem B. E	20	3rd Saturday Holiday	18	3rd Saturday Holiday	15	3rd Saturday Holiday	20	3rd Saturday Holiday	17	3rd Saturday Holiday
SUN	18		17		21		19		16		21		18	
MON	19	Industrial Visit – 5 <sup>th</sup> Sem (CS/IS/AIML), B. E	18		22	Commencement of classes of IV Semester B. E Technical Talk	20		17	Holiday - Bakrid	22	22 <sup>nd</sup> to 24 <sup>th</sup> July 24 - Test II – IV Sem B. E	19	Commencement of Classes III Sem B. E and 19 <sup>th</sup> Aug to 12 <sup>th</sup> Sep 24 – IVth Semester Theory Examinations
TUE	20		19		23		21		18	18 <sup>th</sup> to 20 <sup>th</sup> June 24, II-Test IInd Semester and 18th June to 5 <sup>th</sup> July 2024 Theory Examination of I Sem MBA/MCA/M. Tech	23		20	
WED	21		20	20 <sup>th</sup> to 30 <sup>th</sup> Mar 24 Practical Examination – Vth Sem B. E	24	"Battle of Science" for IInd Sem Students	22	Display of 1st Test IA Marks of II Sem on NB and ERP Communication to parents, Technical Talk	19		24		21	
THU	22		21		25	25 <sup>th</sup> April VIII Semester B. E Technical Talk	23	23 <sup>rd</sup> to 30 <sup>th</sup> May 24, Internship Viva-voce/Project Viva- VIII Semester	20	Hack-a-City 2.0	25		22	
FRI	23	23 <sup>rd</sup> Feb to 5 <sup>th</sup> Mar 2024 Practical Exam B.E I Sem B. E	22		26		24		21	Hack-a-City 2.0	26		23	International Conference
SAT	24		23		27		25	PTM – IInd Semester	22	Graduation Day	27	27 <sup>th</sup> to 30 <sup>th</sup> JULY 24- B.E - VI SEM IA3	24	International Conference
SUN	25		24		28		26		23		28		25	
MON	26		25		29	Commencement of Classes of VI Semester B. E	27		24		29		26	
TUE	27		26	26 <sup>th</sup> to 28 <sup>th</sup> March 24, I Test MBA and 26 <sup>th</sup> March VIII Semester B. E	30		28		25		30		27	
WED	28		27				29	Tech Savy	26	Display of IInd IA Marks on NB and ERP Communication to parents	31	Last working day of VI Semester B. E	28	
THU	29		28	28 <sup>th</sup> Mar to 17 <sup>th</sup> April 24, Theory Examination – III Sem B. E			30		27				29	
FRI			29	Holiday – Good Friday			31		28				30	
SAT			30						29	Last Working Day of The II Semester B. E			31	
SUN			31						30					

Note: 1. Students Feedback should be taken immediately after the Test. 2. No additional circular will be issued for the dates mentioned in Event 3. Department Activities/Events to be planned during Fridays and Saturdays



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ACADEMIC YEAR:2023-24

## DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

### COURSE PREFERENCE

Name of the Faculty: Mr. Mahesh Basavaraj

Designation: Asst. Professor

Sl. No	Course Code and Name	Year/Semester
1.	BPLCK205B-Introduction to python Programming,	1 <sup>st</sup> /2 <sup>nd</sup>
2.	21AI63-Machine Learning,	3 <sup>rd</sup> /6 <sup>th</sup>
3.	21AIL66-Machine Learning Laboratory	3 <sup>rd</sup> /6 <sup>th</sup>
4.	21AD62-Data Science and Its Applications	3 <sup>rd</sup> /6 <sup>th</sup>

Signature of Faculty



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## Department of Artificial Intelligence and Machine Learning Academic Year-2023-24

### Subject Allotment EVEN SEMESER

SL. NO.	Name of the Faculty	Course code and name	Year /semester	Signature
1	Dr. S Vagdevi	18AI824-Modern Information Retrieval	4 <sup>th</sup> /8 <sup>th</sup>	<i>Vagdevi</i>
2	Mrs. Vindhya R	18AI81-Neural networks and Deep Learning, BAD402-Artificial Intelligence	4 <sup>th</sup> /8 <sup>th</sup>	<i>Vindhya</i>
3	Mr. Mahesh Basavaraj	BPLCK205B-Introduction to python Programming, 21AI63-Machine Learning, 21AIL66-Machine Learning Laboratory	1 <sup>st</sup> /2 <sup>nd</sup> 3 <sup>rd</sup> /6 <sup>th</sup>	<i>Mahesh</i>
4	Mrs. Jayashree Badiger	BUHK408-Universal Human Values, BPLCK205B-Introduction to Python programming Lab, Project Work Phase-2	2 <sup>nd</sup> /4 <sup>th</sup> 1 <sup>st</sup> /2 <sup>nd</sup> 4 <sup>th</sup> /8 <sup>th</sup>	<i>Jayashree</i>
5	Ms. Maheshwari Patil	BYOK459-YOGA 21AD62-Data Science and its Applications Lab BCS403-Data Base Management System Lab BAD402-Artificial Intelligence Lab	2 <sup>nd</sup> /4 <sup>th</sup> 3 <sup>rd</sup> /6 <sup>th</sup> 2 <sup>nd</sup> /4 <sup>th</sup> 2 <sup>nd</sup> /4 <sup>th</sup>	<i>Patil</i>
6	Ms. Nasrath BK	BCS401-Analysis and Design of Algorithm BCSL404- Analysis and Design of Algorithm Lab 21AD62-Data Science and Its Applications	2 <sup>nd</sup> /4 <sup>th</sup> 2 <sup>nd</sup> /4 <sup>th</sup> 3 <sup>rd</sup> /6 <sup>th</sup>	<i>Nasrath</i>
7	Mrs. Shruti B Hiregoudar	21CS61-Software Engineering and Project Management BCS403-Data Base Management System	3 <sup>rd</sup> /6 <sup>th</sup> 2 <sup>nd</sup> /4 <sup>th</sup>	<i>Hiregoudar</i>
8	Mrs. Sangeetha N	21AI641-Business Intelligence BDS4564-MONGO DB Lab 21AIL66-Machine Learning Laboratory	3 <sup>rd</sup> /6 <sup>th</sup>	<i>Sangeetha</i>

*Vagdevi*  
Dr. S Vagdevi

HOD

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**CITY ENGINEERING COLLEGE**

Department of AI & ML

IV SEM

Time Table for EVEN SEM AY 2023-2024

W.E.F. 22/04/2024

Room:402

Class Teacher: Mrs Nasrath B K

DAY	09:00- 10:00 AM	10:00 - 11:00 AM		11:15- 12:15 PM	12:15 - 01:15PM		02:00 - 03:00 PM	03:00 - 04:00 PM	04:00 - 05:00 PM
MON	DMS RS	ADA NBK	Short Break	ADA-A1/ MONGO DB-A2 NBK / SN		Lunch Break	DMS (T) RS	YOGA MP	Library
TUE	AI(T) VR	DBMS SBH & MP		ADA-A2/ MONGO DB-A3 NBK /SN			DBMS SH	ADA NBK	
WED	AI VR	DMS RS		AI LAB A2/DBMS LAB A1 VR/SBH &MP			ADA-A3/ MONGO DB-A1 NBK / SN		
THU	AI LAB A1/DBMS LAB A2 VR /SBH&MP			DMS RS	BIO MS		ADA NBK	DBMS SBJ	
FRI	AI VR			BIO MS	UHV JB		AI LAB A3/DBMS LAB A2 VR /SBH&MP		
SAT	NSS/PHY EDU/ YOGA			Proctoring					

Sl . No	Course Code	Course Name	Course	Faculty Name	Credits
1	BCS401	ANALYSIS AND DESIGN OF ALGORITHMS	ADA	Mrs. NASRATH B K (NBK)	3
2	BAD402	ARTIFICIAL INTELLIGENCE	AI	Mrs. VINDHYA R (VR)	4
3	BCS403	DATABASE MANAGEMENT SYSTEMS	DBMS	Mrs. SHRUTHI B H (SBH)	4
4	BCSL404	ANALYSIS AND DESIGN OF ALGORITHMS LAB	ADA LAB	Mrs. NASRATH B K (NBK)	1
5	BCS405A	DISCRETE MATHEMATICAL STRUCTURES	DMS	Mrs. REKHA (RS)	3
6	BDS456B	MONGO DB	MDB	Mrs. SANGEETHA N (SN)	1
7	BBOC407	BIOLOGY FOR COMPUTER ENGINEERS	BIO	Mrs. MEGHANA (MS)	2
8	BUHK408	UNIVERSAL HUMAN VALUES	UHV	Mrs. Jayashree Badiger (JB)	1
9	BYOK459	YOGA	YOGA	Ms. Maheshwari Patil	0

TT Co-ordinator: Prof Vindhya R

HOD

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Principal

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Kanakapura Main Road, BANGALORE - 560 061



# CITY ENGINEERING COLLEGE

Department of AI & ML

VI SEM

Time Table for EVEN SEM AY 2023-2024

W.E.F: 29/04/2024

Class Teacher: Mr Mahesh Basavaraj

Room: 401

DAY	09:00- 10:20 AM	10:00 - 11:05 AM		11:15- 12:15 PM	12:15 - 01:15PM		02:00 - 03.00 PM	03:00 - 04:00 PM	04:00 - 05:00 PM	
MON	SE SBH	BI SN	Short Break	OE	SE(T) SBH	Lunch Break	← DS -A1 / ML -A2 → NBK& MP/MB			
TUE	OE	BI SN		SE SBH	ML MB		INTERNSHIP PRESENTATIONS			
WED	ML MB	DS NBK		BI SN	DS NBK		← DS -A2 / ML -A1 → NBK&MP/MB			
THU	DS NBK	OE		ML MB	SE(T) SBH		PROCTORING			
FRI	MINI PROJECT PRESENTATIONS			LIBRARY						
SAT	LIBRARY			DEPT ACTIVITIES						

Sl . No	Course Code	Course Name	Course	Faculty Name	Credits
1	21CS61	SOFTWARE ENGINEERING & PROJECT MANAGEMENT	SE	Mrs. SHRUTHI B H (SBH)	3
2	21AD62	DATA SCIENCE & ITS APPLICATIONS	DS & A	Mrs. NASRATH B K (NBK)	4
3	21AI63	MACHINE LEARNING	ML	Mr. MAHESH BASAVARAJ (MB)	3
4	21AI641	BUSINESS INTELLIGENCE	BI	Mrs. SANGEETHA N	3
5	21ME651	RENEWABLE ENERGY SOURCES	RE	Mr. HARSHAVARDHAN	3
6	21AIL66	MACHINE LEARNING LABORATORY	ML LAB	Mr. MAHESH BASAVARAJ(MB)	1
7	21AIMP67	MINI PROJECT	MP	Mrs. SANGEETHA N	2
8	21INT68	INTERNSHIP	INT	Mr. MAHESH BASAVARAJ)	3

Time-Table Co-ordinator: Prof Vindhya R

**HOD**  
 Dept of Artificial Intelligence & Machine Learning  
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**Principal**  
 PRINCIPAL  
 CITY ENGINEERING COLLEGE  
 Kanakapura Main Road, BANGALORE - 560 061



# CITY ENGINEERING COLLEGE

Department of AI & ML

W.E.F: 12/02/2024

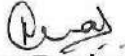
VIII SEM


Time Table for EVEN SEM AY 2023-2024

Room:403


DAY	09:00- 10:00 AM	10:00 - 11:00 AM		11:15- 12:15 PM	12:15 - 01:15PM		02:00 - 03:00 PM	03:00 - 04:00 PM	04:00 - 05:00 PM
MON	NN &DL VR	NN &DL VR	Short Break	MIR Dr SV		Lunch Break	PROJECT PHASE2		
TUE	NN &DL VR	MIR Dr SV		PROJECT PHASE2			TECHNICAL SEMINAR		
WED	TECHNICAL SEMINAR			INTERNSHIP			INTERNSHIP		
THU	PROJECT WORK			PROJECT WORK			PROJECT WORK		
FRI	PROJECT WORK			PROJECT WORK			PROJECT WORK		
SAT	PROJECT WORK			PROJECT WORK			PROJECT WORK		

Sl . No	Course Code	Course Name	Course	Faculty Name
1	18AI81	ADVANCED ARTIFICIAL INTELLIGENCE	NN &DL	Mrs Vindhya R
2	18AI824	ADVANCED MACHINE LEARNING	MIR	Dr. S Vagdevi
3	18IP783	PROJECT WORK PHASE2	PROJECT	Mrs. Jayshree Badiger
4	18AI84	TECHNICAL SEMINAR	SEMINAR	Mr. Mahesh Basavraj
5	18AI185	INTERNSHIP	INTERNSHIP	Mr. Mahesh Basavraj

  
Class Teacher: Vindhya R

  
HOD

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Dept of Artificial Intelligence & Machine Learning  
CITY ENGINEERING COLLEGE  
Doddakallasandra (Ofc) Kanakapura Road,  
Bangalore-560061

  
Principal  
PRINCIPAL  
CITY ENGINEERING COLLEGE  
Kanakapura Main Road, BANGALORE - 560 061



**CITY**  
ENGINEERING COLLEGE

Off Kanakapura Rd, Doddakallasandra,  
Bangalore 560062

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**Department Of Artificial Intelligence & Machine Learning**

## **COURSE FILE**

**AY 2023-24 Even Semester**

**Name: Mr. Mahesh Basavaraj**

**Designation: Asst. Professor**

**Subject Name: Introduction to Python  
Programming**

**Subject Code: BPLCK205B**

**Semester & Branch: II AIML**



# CITY ENGINEERING COLLEGE

Department of AI & ML

Time Table for EVEN SEM AY 2023-2024

INDIVIDUAL TIME TABLE

Faculty Name: Mrs. Mahesh Basavaraj

DAY	09:00- 10:00AM	10:00 - 11:00 AM	11:00-11:15	11:15- 12:15 PM	12:15 - 01:15 PM	1.15-2.00	2:00 - 3:00 PM	3:00 - 04:00 PM	4:00 - 05:00 PM	
MON			Short Break	PLC		Lunch Break	ML Lab A2			
TUE	PLC				ML		PLCL -A1 Lab			
WED	ML						ML Lab A1			
THU					ML		PLCL -A2 Lab			
FRI	PLCL -A3 Lab				Mini Projects					
SAT										

Sl . No	Course Code	Course Name	THEORY	TUTORIALS	PRACTICALS	UNITS
1	21AI63	MACHINE LEARNING	3			3
2	21AIL66	MACHINE LERANING LAB			2*2 BATCHES	4
3	BPLCK205B	INTRODUCTION TO PYTHON PROGRAMMING	2	1	2*3 BATCHES	6
4		PROJECTS+MINI PROJECTS			2*3 Batches	3
		DEPARTMENT WORKS				2
TOTAL UNITS						18

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HOD

Dept of Artificial Intelligence & Machine Learning  
CITY ENGINEERING COLLEGE  
Doddakallasandra, (Off) Kanakapura Road,  
Bangalore-560061

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Kanakapura Main Road, BANGALORE - 560 061

Course Title:	Introduction to Python Programming		
Course Code:	<b>BPLCK105B/205B</b>	CIE Marks	50
Course Type (Theory/Practical /Integrated )	Integrated	SEE Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P: S)	2:0:2:0	Exam Hours	03
Total Hours of Pedagogy	40 hours	Credits	03
<b>Course objectives</b> <ul style="list-style-type: none"> <li>● Learn the syntax and semantics of the Python programming language.</li> <li>● Illustrate the process of structuring the data using lists, tuples</li> <li>● Appraise the need for working with various documents like Excel, PDF, Word and Others.</li> <li>● Demonstrate the use of built-in functions to navigate the file system.</li> <li>● Implement the Object Oriented Programming concepts in Python.</li> </ul>			
<b>Teaching-Learning Process</b> These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes and make Teaching -Learning more effective <ol style="list-style-type: none"> <li>1. Use <a href="https://pythontutor.com/visualize.html#mode=edit">https://pythontutor.com/visualize.html#mode=edit</a> in order to visualize the python code</li> <li>2. Demonstrate and visualize basic data types (list, tuple, dictionary).</li> <li>3. Chalk and talk</li> <li>4. online and videos</li> </ol>			
<b>Module-1 (08 hrs)</b>			
<b>Python Basics:</b> Entering Expressions into the Interactive Shell, The Integer, Floating-Point, and String Data Types, String Concatenation and Replication, Storing Values in Variables, Your First Program, Dissecting Your Program, <b>Flow control:</b> Boolean Values, Comparison Operators, Boolean Operators, Mixing Boolean and Comparison Operators, Elements of Flow Control, Program Execution, Flow Control Statements, Importing Modules, Ending a Program Early with sys.exit(), <b>Functions:</b> def Statements with Parameters, Return Values and return Statements, The None Value, Keyword Arguments and print(), Local and Global Scope, The global Statement, Exception Handling, A Short Program: Guess the Number <b>Textbook 1: Chapters 1 – 3</b>			
<b>Module-2 (08 hrs)</b>			
<b>Lists:</b> The List Data Type, Working with Lists, Augmented Assignment Operators, Methods, Example Program: Magic 8 Ball with a List, List-like Types: Strings and Tuples, References, <b>Dictionaries and Structuring Data:</b> The Dictionary Data Type, Pretty Printing, Using Data Structures to Model Real-World Things, <b>Textbook 1: Chapters 4 – 5</b>			
<b>Module-3 (08 hrs)</b>			

	<p><b>Manipulating Strings:</b> Working with Strings, Useful String Methods, Project: Password Locker, Project: Adding Bullets to Wiki Markup</p> <p><b>Reading and Writing Files:</b> Files and File Paths, The os.path Module, The File Reading/Writing Process, Saving Variables with the shelve Module, Saving Variables with the print.format() Function, Project: Generating Random Quiz Files, Project: Multiclipboard,</p> <p><b>Textbook 1: Chapters 6 , 8</b></p>
	<b>Module-4 (08 hrs)</b>
	<p><b>Organizing Files:</b> The shutil Module, Walking a Directory Tree, Compressing Files with the zipfile Module, Project: Renaming Files with American-Style Dates to European-Style Dates, Project: Backing Up a Folder into a ZIP File,</p> <p><b>Debugging:</b> Raising Exceptions, Getting the Traceback as a String, Assertions, Logging, IDLE's Debugger.</p> <p><b>Textbook 1: Chapters 9-10</b></p>
	<b>Module-5 (08 hrs)</b>
	<p><b>Classes and objects:</b> Programmer-defined types, Attributes, Rectangles, Instances as return values, Objects are mutable, Copying,</p> <p><b>Classes and functions:</b> Time, Pure functions, Modifiers, Prototyping versus planning,</p> <p><b>Classes and methods:</b> Object-oriented features, Printing objects, Another example, A more complicated example, The init method, The __str__ method, Operator overloading, Type-based dispatch, Polymorphism, Interface and implementation,</p> <p><b>Textbook 2: Chapters 15 – 17</b></p>
<b>Course outcome (Course Skill Set)</b>	
At the end of the course the student will be able to:	
C01	Demonstrate proficiency in handling loops and creation of functions.
C02	Identify the methods to create and manipulate lists, tuples and dictionaries.
C03	Develop programs for string processing and file organization
C04	Interpret the concepts of Object-Oriented Programming as used in Python.
<b>Programming Exercises:</b>	
<ol style="list-style-type: none"> <li>1.             <ol style="list-style-type: none"> <li>a. Develop a program to read the student details like Name, USN, and Marks in three subjects. Display the student details, total marks and percentage with suitable messages.</li> <li>b. Develop a program to read the name and year of birth of a person. Display whether the person is a senior citizen or not.</li> </ol> </li> <li>2.             <ol style="list-style-type: none"> <li>a. Develop a program to generate Fibonacci sequence of length (N). Read N from the console.</li> <li>b. Write a function to calculate factorial of a number. Develop a program to compute binomial coefficient (Given N and R).</li> </ol> </li> <li>3. Read N numbers from the console and create a list. Develop a program to print mean, variance and standard deviation with suitable messages.</li> <li>4. Read a multi-digit number (as chars) from the console. Develop a program to print the frequency of each digit with suitable message.</li> <li>5. Develop a program to print 10 most frequently appearing words in a text file. [Hint: Use dictionary</li> </ol>	

with distinct words and their frequency of occurrences. Sort the dictionary in the reverse order of frequency and display dictionary slice of first 10 items]

6. Develop a program to sort the contents of a text file and write the sorted contents into a separate text file. [Hint: Use string methods strip(), len(), list methods sort(), append(), and file methods open(), readlines(), and write()].
7. Develop a program to backing Up a given Folder (Folder in a current working directory) into a ZIP File by using relevant modules and suitable methods.
8. Write a function named DivExp which takes TWO parameters a, b and returns a value c ( $c=a/b$ ). Write suitable assertion for  $a>0$  in function DivExp and raise an exception for when  $b=0$ . Develop a suitable program which reads two values from the console and calls a function DivExp.
9. Define a function which takes TWO objects representing complex numbers and returns new complex number with a addition of two complex numbers. Define a suitable class 'Complex' to represent the complex number. Develop a program to read N ( $N \geq 2$ ) complex numbers and to compute the addition of N complex numbers.
10. Develop a program that uses class Student which prompts the user to enter marks in three subjects and calculates total marks, percentage and displays the score card details. [Hint: Use list to store the marks in three subjects and total marks. Use \_\_init\_\_() method to initialize name, USN and the lists to store marks and total, Use getMarks() method to read marks into the list, and display() method to display the score card details.]

#### Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50). The minimum passing mark for the SEE is 35% of the maximum marks (18 marks out of 50). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination(SEE), and a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

#### Continuous Internal Evaluation (CIE):

The CIE marks for the theory component of the IC shall be **30 marks** and for the laboratory component **20 Marks**.

#### CIE for the theory component of the IC

- Three Tests each of 20 Marks; after the completion of the syllabus of 35-40%, 65-70%, and 90-100% respectively.
- Two Assignments/two quizzes/ seminars/one field survey and report presentation/one-course project totaling 20 marks.

Total Marks scored (test + assignments) out of 80 shall be scaled down to **30 marks**

#### CIE for the practical component of the IC

- On completion of every experiment/program in the laboratory, the students shall be



evaluated and marks shall be awarded on the same day. The **15 marks** are for conducting the experiment and preparation of the laboratory record, the other **05 marks shall be for the test** conducted at the end of the semester.

- The CIE marks awarded in the case of the Practical component shall be based on the continuous evaluation of the laboratory report. Each experiment report can be evaluated for 10 marks. Marks of all experiments' write-ups are added and scaled down to 15 marks.
- The laboratory test (**duration 03 hours**) at the end of the 15<sup>th</sup> week of the semester /after completion of all the experiments (whichever is early) shall be conducted for 50 marks and scaled down to **05 marks**.

Scaled-down marks of write-up evaluations and tests added will be CIE marks for the laboratory component of IC/IPCC for **20 marks**.

- The minimum marks to be secured in CIE to appear for SEE shall be 12 (40% of maximum marks) in the theory component and 08 (40% of maximum marks) in the practical component. The laboratory component of the IC/IPCC shall be for CIE only. However, in SEE, the questions from the laboratory component shall be included. The maximum of 05 questions is to be set from the practical component of IC/IPCC, the total marks of all questions should not be more than 25 marks.

The theory component of the IC shall be for both CIE and SEE.

#### **Semester End Examination (SEE):**

##### **SEE for IC**

Theory SEE will be conducted by University as per the scheduled time table, with common question papers for the course (duration 03 hours)

1. The question paper will have ten questions. Each question is set for 20 marks.
2. There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), **should have a mix of topics** under that module.
3. The students have to answer 5 full questions, selecting one full question from each module.

**The theory portion of the Integrated Course shall be for both CIE and SEE, whereas the practical portion will have a CIE component only. Questions mentioned in the SEE paper shall include questions from the practical component).**

##### **Passing standard:**

- The minimum marks to be secured in CIE to appear for SEE shall be 12 (40% of maximum marks-30) in the theory component and 08 (40% of maximum marks -20) in the practical component. The laboratory component of the IPCC shall be for CIE only. However, in SEE, the questions from the laboratory component shall be included. The maximum of 04/05 questions to be set from the practical component of IPCC, the total marks of all questions should not be more than 30 marks.

- SEE will be conducted for 100 marks and students shall secure 35% of the maximum marks to qualify for the SEE. Marks secured will be scaled down to 50.

**Suggested Learning Resources:****Text Books**

1. Al Sweigart, "Automate the Boring Stuff with Python", 1<sup>st</sup> Edition, No Starch Press, 2015. (Available under CC-BY-NC-SA license at <https://automatetheboringstuff.com/>)  
(Chapters 1 to 18, except 12) for lambda functions use this link:  
<https://www.learnbyexample.org/python-lambda-function/>
2. Allen B. Downey, "Think Python: How to Think Like a Computer Scientist", 2<sup>nd</sup> Edition, Green Tea Press, 2015. (Available under CC-BY-NC license at <http://greenteapress.com/thinkpython2/thinkpython2.pdf>)  
(Chapters 13, 15, 16, 17, 18) (Download pdf/html files from the above link)

**Web links and Video Lectures (e-Resources):**

- <https://www.learnbyexample.org/python/>
- <https://www.learnpython.org/>
- <https://pythontutor.com/visualize.html#mode=edit>

**Activity Based Learning (Suggested Activities in Class)/ Practical Based learning**

- Quizzes for list, tuple, string dictionary slicing operations using below link  
<https://github.com/sushantkhara/Data-Structures-And-Algorithms-with-Python/raw/main/Python%203%20%20400%20exercises%20and%20solutions%20for%20beginners.pdf>

**COs and POs Mapping (Individual teacher has to fill up)**

COs	POs						
	1	2	3	4	5	6	7
C01							
C02							
C03							
C04							
C05							

Level 3- Highly Mapped, Level 2- Moderately Mapped, Level 1-Low Mapped, Level 0- Not Mapped

# CITY ENGINEERING COLLEGE

OFF KANAKAPURA ROAD, DODDAKALLASANDRA, BANGALORE 560062

DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

## STUDENT LIST OF II SEMESTER

AY: EVEN 2023-24

Sl.	USN	Name of the Student
1	1CE23A1001	AALIYA ZAINAB
2	1CE23A1002	AKSHATA PATIL
3	1CE23A1003	AMBIKA D
4	1CE23A1004	ANUJ P SAI
5	1CE23A1005	ASHIK T K
6	1CE23A1006	BARANI R
7	1CE23A1007	BHARATH R
8	1CE23A1008	BHUVAN SHETTY N
9	1CE23A1009	C M SHIVAM
10	1CE23A1010	DAAMYAA SHREE
11	1CE23A1011	DEEPAK J
12	1CE23A1012	Gagana s
13	1CE23A1013	GANESH
14	1CE23A1014	GURUDEV M
15	1CE23A1015	HARI PRASAD B
16	1CE23A1016	HARSHAVARDHAN G L
17	1CE23AI017	HUZAIFA AHMED S E
18	1CE23A1018	INDUSHREE N
19	1CE23A1019	JAHNAVI H
20	1CE23A1020	JEEVAN S
21	1CE23A1021	KISHORE VELAYUDHAN

50	1CE23A1051	SWATHI B G
51	1CE23A1052	Syed Adnan
52	1CE23A1053	TANUJA B
53	1CE23A1054	TANUJA P
54	1CE23A1055	THIMMEGOWDA B N
55	1CE23A1056	VARSHINI G
56	1CE23A1057	VEDASIMHA PRASHANTH
57	1CE23A1058	VIDYA A N
58	1CE23A1059	VINAY KS
59	1CE23A1060	VINOD B J
60	1CE23A1061	VISHAL V
61	1CE23A1062	YASHWANTH K G
62	1CE23A1063	ZAID AHMED

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**HOD Sign**

## LESSON PLAN

Week	Date		Topics Planned
	From	To	
I	6/3/24	9/3/24	Python Basics, Data types, python Shell, String concatenation, various First program, Boolean values, Comparison operators.
II	11/3/24	16/3/24	Flow Control: Operators, IF, IF-ELSE looping statements; FOR, WHILE loops, Break, continue, Importing module Sys. exit()
III	18/3/24	23/3/24	Functions: Definition, Return value return statements, None value, keyword arguments, local & Global scopes, Exception handling, try/except
IV	25/3/24	30/3/24	Lists: The list datatype, working with the lists, Augmented assignment operators, List methods
V	1/4/24	6/4/24	Example program: Magic 8 ball with a list. List like types: Set and Tuples, References
VI	8/4/24	13/4/24	Dictionaries and structuring data Pretty printing, using data structures to model Real world things.
VII	15/4/24	20/4/24	Manipulating Strings: Strings methods Project password locker, Proj
VIII	22/4/24	27/4/24	Project - Adding bullets to wiki Reading and writing files: files & file paths, os.path module

## LESSON PLAN

Week	Date		Topics Planned
	From	To	
IX	29/4/24	4/5/24	The file Reading/Writing process, Saving Variables with Shelve module, print.format(), Project: Generating Random Quiz. Files
X	6/5/24	11/5/24	Organizing files: The Shutil module <sup>multi directory</sup> walking a directory tree, Compressing files with the zip module.
XI	13/5/24	18/5/24	Project: Backing up a folder into a zip file. Debugging: Project: Renaming files
XII	20/5/24	25/5/24	Debugging: Raising exceptions, Getting the traceback as a string, Assertions Logging, IDLE's debugger.
XIII	27/5/24	1/6/24	Classes & Objects: programmer defined types, Attributes, rectangles Instances, Objects, Copying objects.
XIV	3/6/24	8/6/24	Class & Functions: Time, pure functions, Modifiers, prototyping vs planning
XV	10/6/24	15/6/24	class & methods: OOPs features, Printing objects, Init method, <u>str</u> method, operator overloading
XVI	17/6/24	22/6/24	polymorphism, interface & Implementation. examples for OOPs. Revision.

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## BPLCK205B RECORD OF CLASS WORK

Date	Period	Topics Covered
11/3/24	3	Python Basics: Shell, first program Strings, variables,
12/3/24	1	Boolean values, Operators, compar.
13/3/24	3	Flow control: IF, IF-ELSE, nested
15/3/24	3	Switch statement, break, None,
18/3/24	3	Looping: FOR, WHILE,
19/3/24	1	Importing modules, sys, os etc., f definition, syntax.
26/3/24	3	Function return values, return sta ments, Argument passing, None
27/3/24	1	Local & global scope, Exception handling. Project: Guess the Num
1/4/24	3	Lists: List datatype, working with
2/4/24	1	Augmented assignment operators.
8/4/24	2	List methods,
8/4/24	3	Strings and Tuples.
10/4/24	3	Example: Magic 8 ball with a l
15/4/24	1	Dictionary datatype
16/4/24	2 & 3	Dictionary datatype / Poetry pro.
18/4/24	3	working with strings, useful s
22/4/24	3	Project Password locker, wiki mac
23/4/24	1	Reading & writing files, o.
25/4/24	2	OS.path module, file Read/write
29/4/24	3	Saving variables with Shelve, Print

Mahesh

Teachers Signature

Vagdev S

HOD'S Signature







# CITY ENGINEERING COLLEGE

Approved by AICTE New Delhi & Affiliated by VTU, Belagavi  
Accredited by NAAC with B+ grade  
Doddakallasandra Metro Station, Off Kanakapura Main Road,  
Next to Gokulam Apartment, Bangalore – 560 062



**SUB: Introduction to Python Programming      Sub Code: BPLCK205B**

## Module-1 Question Bank:

1. What are the three main data types in Python? Explain each with an example.
2. How do you concatenate strings in Python? Provide an example.
3. Explain the difference between = and == operators in Python.
4. What is the purpose of the sys.exit() function?
5. Write a Python program to calculate the area of a circle using the math module.
6. Describe the difference between local and global scope in Python.
7. How do you define a function with parameters in Python? Give an example.
8. Explain the concept of Boolean operators in Python. List the main Boolean operators.
9. What is the purpose of the 'if \_\_name\_\_ == "\_\_main\_\_":' idiom in Python?
10. Write a Python program that uses a while loop to implement a simple guessing game.
11. How do you handle exceptions in Python? Provide an example using try-except blocks.
12. Explain the difference between break and continue statements in Python loops.
13. What is the purpose of the global keyword in Python? When would you use it?
14. Write a Python function that calculates the factorial of a given number using recursion.
15. Describe the difference between mutable and immutable data types in Python. Give examples of each.

# CBCS SCHEME

USN 

1	C	E	2	2	A	I	0	1	4
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BPLCK205B/ BPLCKB205

Second Semester B.E./B.Tech. Degree Examination, Dec.2023/Jan.2024

## Introduction to Python Programming

Time: 3 hrs.

Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.  
2. M : Marks , L: Bloom's level , C: Course outcomes.

Module - 1				M	L	C
Q.1	a.	Explain Local and global variable and scope of variable in python.	7	L1	CO1	
	b.	List and explain with example different comparison and Boolean operators.	8	L1	CO1	
	c.	Write a python program to generate Fibonacci sequence of length 'n'.	5	L3	CO1	
OR						
Q.2	a.	List and explain with syntax and example the flow control statement in python.	10	L1	CO1	
	b.	Demonstrate with example print( ), input( ) and string replication function in python.	6	L2	CO1	
	c.	Develop a program to read the name and year of birth of a person. Display whether person is senior citizen or not?	4	L3	CO1	
Module - 2						
Q.3	a.	What is a list? Explain append( ), insert( ), and remove methods with example.	10	L1	CO2	
	b.	Explain the methods of list data types in python for the following operations with suitable code snippet for each. i) Adding value to list ii) Removing value from list iii) Finding a value in a list iv) Sorting the value in a list v) Reversing a value in list	10	L1	CO2	
OR						
Q.4	a.	Explain get( ), item( ), keys( ) and values( ) methods of dictionary in python.	8	L2	CO2	
	b.	How is tuple different from list? Which function is used to convert list to tuple?	7	L1	CO2	
	c.	Differentiate between list and dictionary.	5	L2	CO2	
Module - 3						
Q.5	a.	Explain the syntax and example various string methods.	7	L1	CO3	
	b.	Discuss the following methods of OS module i) chdir( ) ii) rmdir( ) iii) walk( ) iv) listdir( )	8	L1	CO3	



# CBCS SCHEME

BPLCK205B/BPLCKB205

Second Semester B.E./B.Tech. Degree Examination, June/July 2023

## Introduction to Python Programming

Time: 3 hrs.

Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.  
2. M : Marks , L: Bloom's level , C: Course outcomes.

Module - 1			M	L	C
Q.1	a.	Demonstrate with example print ( ), input ( ) and string replication.	6	L3	CO1
	b.	Develop a program to generate Fibonacci square of length (N). Read N from the console.	6	L3	CO1
	c.	Explain elif, for, while, break and continue statements in python with examples for each.	8	L2	CO1
OR					
Q.2	a.	What are user defined functions? How can we pass parameters in user defined functions? Explain with suitable example.	5	L1	CO1
	b.	Explain Local and Global scope with variables for each.	8	L2	CO1
	c.	Develop a program to read the name and year of birth of a person. Print whether the person is a senior citizen or not.	7	L3	CO1
Module - 2					
Q.3	a.	What is a List? Explain append ( ), insert ( ) and remove ( ) methods with examples.	8	L2	CO2
	b.	Explain the following methods with example : i) keys ( ) ii) values ( ) iii) items ( ) in a dictionary.	12	L2	CO2
OR					
Q.4	a.	How is tuple different from a list and which function is used to convert list to tuple? Explain.	6	L2	CO2
	b.	List the merits of dictionary over list.	4	L1	CO2
	c.	Read N numbers from the console and create a list. Develop a program to compute and print mean, variance and standard deviation with messages.	10	L3	CO2
Module - 3					
Q.5	a.	Explain the following methods with suitable examples : i) upper ( ) ii) lower ( ) iii) is_upper ( ) iv) is_lower ( )	8	L2	CO3
	b.	Illustrate with example opening of a file with open ( ) function, reading the contents of the file with read ( ) and writing to files with write ( ).	12	L2	CO3

OR

Q.6	a.	Explain the steps involved in adding bullets to Wiki – Markup. Support with appropriate code.	10	L2	CO3
	b.	Develop a program to sort the contents of a text file and write the sorted contents into a separate text file. [Use strip ( ) , len ( ) , list methods sort ( ) , append and file methods open ( ) , readlines ( ) and write ( )].	10	L3	CO3

Module – 4

Q.7	a.	How do you copy files and folders using Shutil module? Explain in detail.	6	L2	CO3
	b.	What are Assertions? Write the contents of an assert statement. Explain them with examples.	8	L2	CO3
	c.	Illustrate the logging levels in python.	6	L2	CO3

OR

Q.8	a.	With suitable code, explain Backing up a Folder into a Zip file. Clearly mention the steps involved.	12	L2	CO3
	b.	Explain the logging module and debug the factorial of number program.	8	L3	CO3

Module – 5

Q.9	a.	What is a Class? How to define class in Python? How to initiate a class and how the class members are accessed?	8	L2	CO4
	b.	Define Pure function. Illustrate with an example Python program.	8	L3	CO4
	c.	Explain Printing objects.	4	L1	CO4

OR

Q.10	a.	What is Polymorphism? Demonstrate polymorphism with functions to find histogram to count the numbers of times each letters appears in a word and in sentence.	10	L3	CO4
	b.	Write Deck methods to add, remove shuffle and sort cards, with illustrating the problem.	10	L2	CO4

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	c.	Read multidigit number from console. Develop a program to print frequency of occurrence of each digit with suitable message.	5	L3	CO3
<b>OR</b>					
Q.6	a.	Explain File reading and writing process with suitable python program.	7	L3	CO3
	b.	With code snippet, explain saving variables using shelve module and print( ) and print format( ) functions.	6	L2	CO3
	c.	Write a python code to implement multiclip board project in python.	7	L3	CO3
<b>Module – 4</b>					
Q.7	a.	Explain the functions of shutil module with example.	10	L1	CO3
	b.	What is meant by compressing files? Explain reading, extracting and crating zip files with code snippet.	10	L1	CO3
<b>OR</b>					
Q.8	a.	Explain the following file operation in python with example. i) Copying files and folders ii) Moving files and folders iii) Permanently deleting files and folders	6	L1	CO3
	b.	Define assertions. What does an assert statement in python consists of? Give an example.	7	L1	CO3
	c.	Develop a program to sort contents of a text file and write the forted content into a separate file.	7	L3	CO3
<b>Module – 5</b>					
Q.9	a.	Explain operator overloading and polymorphism with example.	7	L1	CO4
	b.	Explain the concept of pure functions and modifiers with python code.	7	L1	CO4
	c.	Write a function called print time that takes a time object and print it in the form of hour: minute: second?	6	L3	CO4
<b>OR</b>					
Q.10	a.	What is class? How do we define class? How class members are accessed, explain with examples.	6	L1	CO4
	b.	Explain – init( ) and – str( ) method with an example.	8	L1	CO4
	c.	Discuss type based dispatch in python.	6	L1	CO4

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## Module-2 Question Bank:

1. What is a list in Python? How is it different from a tuple?
2. Explain list comprehension with an example.
3. How do you add elements to a list in Python? Mention at least two methods.
4. What are augmented assignment operators? Give examples.
5. Write a Python program to remove duplicates from a list while preserving the order.
6. How do you sort a list in descending order in Python?
7. Explain the difference between `append()` and `extend()` methods for lists.
8. What is a dictionary in Python? How is it different from a list?
9. How do you access and modify values in a dictionary?
10. Write a Python program to merge two dictionaries.
11. Explain the difference between shallow copy and deep copy for lists in Python.
12. How do you create a nested dictionary in Python? Provide an example.
13. What is the purpose of the `get()` method in dictionaries? How is it different from direct key access?
14. Write a Python program to find the most frequent element in a list.
15. Explain how to use the `zip()` function to create a dictionary from two lists.



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## Module-3 Question Bank:

1. What is string slicing in Python? Provide examples.
2. Explain the difference between find() and index() methods for strings.
3. How do you convert a string to uppercase or lowercase in Python?
4. Write a Python program to check if a string is a palindrome.
5. What is the purpose of the strip() method in string manipulation?
6. How do you open a file for reading and writing in Python?
7. Explain the difference between read(), readline(), and readlines() methods for file objects.
8. What is the purpose of the 'with' statement when working with files in Python?
9. How do you write data to a file in Python? Provide an example.
10. Explain the difference between 'w', 'a', and 'r+' modes when opening a file.
11. What is the shelve module in Python? How is it used?
12. Write a Python program to count the occurrences of each word in a text file.
13. How do you handle file paths in a cross-platform manner using the os.path module?
14. Explain the purpose and usage of the format() method for strings.
15. Write a Python program to encrypt and decrypt a text file using a simple substitution cipher.



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## Module-4 Question Bank:

1. What is the shutil module in Python? List some of its key functions.
2. How do you recursively walk through a directory tree in Python?
3. Explain the process of compressing files using the zipfile module.
4. Write a Python script to rename multiple files in a directory based on a specific pattern.
5. How do you create a backup of a folder as a ZIP file using Python?
6. What is the purpose of raising exceptions in Python? How do you raise a custom exception?
7. Explain the concept of assertions in Python. When would you use them?
8. How do you get the traceback of an exception as a string in Python?
9. What is logging in Python? How does it differ from print statements for debugging?
10. Explain the different logging levels in Python's logging module.
11. How do you use IDLE's debugger to step through a Python program?
12. Write a Python function that uses exception handling to validate user input for a date.
13. Explain the concept of context managers in Python. How do they relate to file handling?
14. How do you create a custom context manager using the 'with' statement?
15. Write a Python script that logs different types of events to separate log files.





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## Module-5 Question Bank:

1. What is a class in Python? How do you define a class?
2. Explain the concept of attributes in Python classes. How are they different from methods?
3. What is the purpose of the `__init__` method in a Python class?
4. How do you create an instance of a class in Python?
5. Explain the concept of inheritance in Python. Provide an example.
6. What is method overriding in Python? How is it implemented?
7. Explain the difference between class variables and instance variables in Python.
8. What is the purpose of the `self` parameter in Python class methods?
9. How do you implement operator overloading in Python classes?
10. Explain the concept of polymorphism in Python with an example.
11. What is the difference between a pure function and a modifier method in Python classes?
12. How do you implement a string representation of an object using the `__str__` method?
13. Explain the concept of encapsulation in Python. How is it achieved?
14. What are class methods and static methods in Python? How do they differ from instance methods?
15. Write a Python class to implement a simple bank account with methods for deposit, withdrawal, and balance inquiry.

These questions cover the main topics of each module as outlined in the course syllabus. They range from basic concepts to more advanced programming tasks, providing a comprehensive review of the course material.



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## DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING


### SUB : Introduction to Python Programming

SUB CODE: BPLCK 205B

Marks : 10

### ASSIGNMENT 1

- 1) What is a flow control statement? Discuss if and if else statements with a flow chart.
- 2) With Python programming examples to each, explain the syntax and control flow diagrams of break and continue statements.
- 3) Write a python program to add n numbers accepted by the user.
- 4) Discuss the list data structure with examples for each.
- 5) write a Python program to accept n numbers and store them in a list. Then print the list without ODD numbers in it.
- 6) For a=['hello', 'how', [1,2,3], [[10,20,30]]] what is the output of following statement
  - i. print( a[ : : ] )
  - ii. print(a[-3][0])
  - iii. print(a[2][ : -1])
  - iv. print(a[0][ : : -1])
- 7) Write a function to calculate factorial of a number. Develop a program to compute binomial coefficient (Given N and R).
- 8) What are functions? Explain the syntax of a function. Write a Python program with actual parameters being passed and return statements for finding the factorial of a number n as input by user.
- 9) Write short notes on Tuples
- 10) Write short notes on Dictionaries

  
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**DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING**

**SUB : Introduction to Python Programming**

**SUB CODE: BPLCK 205B**

**Marks : 10**

## ASSIGNMENT 2

Create a report on a Python Library of your choice. You should Describe the utility/Use cases of the library, and the functions available in it and give appropriate illustrations of the same. Make sure to add pictures of output whenever necessary.

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## NEW TEACHING-LEARNING INITIATIVES

**SUB: Introduction to Python Programming**

**Sub Code: BPLCK205B**

Activity Area	Activity	Learning
GitHub	<ul style="list-style-type: none"><li>• Practiced clone, commit, push, pull commands</li><li>• Collaborated on group projects</li></ul>	<ul style="list-style-type: none"><li>• Version control basics</li><li>• Industry-standard code management</li><li>• Team collaboration skills</li></ul>
AI LLM Models	<ul style="list-style-type: none"><li>• Explored SORA (text-to-video model)</li><li>• Interacted with Claude (language model)</li><li>• Viewed Omni demos (multimodal AI)</li></ul>	<ul style="list-style-type: none"><li>• Potential impact on content creation</li><li>• Capabilities and limitations of AI in NLP</li></ul>
Debugging in IT	<ul style="list-style-type: none"><li>• Learned systematic approach to identifying issues</li><li>• Used debugging tools( in pycharm &amp; Jupyter NB)</li><li>• Discussed logging techniques</li></ul>	<ul style="list-style-type: none"><li>• Methodical problem-solving</li><li>• Familiarity with debugging tools</li><li>• Importance of logging in troubleshooting</li></ul>
Software Testing	<ul style="list-style-type: none"><li>• Discussed various testing types (unit, integration)</li><li>• Explored test-driven development</li></ul>	<ul style="list-style-type: none"><li>• Ensuring software reliability</li><li>• Writing effective test cases</li><li>• Importance of comprehensive testing</li></ul>

  
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# SCHEME FOR EVALUATION

## CIE TEST -- IA -1

SEMESTER & SECTION: S2 'A'

SUB: INTRODUCTION TO PYTHON PROGRAMMING

DATE: 17-05-2024

SUB CODE: BPLCK205B

Q. No	Details of the Answer	Marks Distribution	Total marks
1.	For loop Syntax with an example While loop Syntax with example	3 2	5
2.	Flow Control statement definition If syntax & example If-else syntax && example	1 2 2	5
3.	Exception Definition Explanation Syntax & Example	1 2 2	5
4.	Program with output	5	5
5.	List Explanation, Syntax & Example  Tuple Explanation, Syntax & Example	3  2	5
6.	Dictionary definition program	1 4	5
7.	Program with output	5	5
8.	pop() use with example sort() use with example len() use with example append() use with example insert() use with example	1 1 1 1 1	5
9.	Palindrome program with output	5	5
10.	1 mark for each correct answer	5	5

*Mahesh B*  
Staff Signature:

*Vagdevi S*  
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# CITY ENGINEERING COLLEGE

DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

## SOLUTION FOR EVALUATION

CIE TEST -- IA -1

SEMESTER & SECTION: II 'A'

DATE: 17-05-2024

SUB: INTRODUCTION TO PYTHON PROGRAMMING

SUB CODE: BPLCK205B

Q. No	Details of the Answer	Marks Distribution	Total marks
1.	<p><b>With Python programming examples to each, explain the syntax and control flow diagrams of For loop and While loop</b></p> <p><b>**For Loop:**</b></p> <p>Syntax: for item in iterable:     # Code block to be executed for each item</p> <p>- 'item': Variable that represents each element in the iterable. - 'iterable': Collection of items (e.g., list, tuple, string) over which the loop iterates.</p> <p>Control Flow Diagram: Start --&gt; Iterate over each item in the iterable --&gt; Execute code block --&gt; Repeat until all items are processed --&gt; End</p> <p>Example: Iterate over a list of numbers and print each number numbers = [1, 2, 3, 4, 5] for num in numbers:     print(num)</p> <p><b>**While Loop:**</b></p> <p>Syntax: while condition:     # Code block to be executed as long as the condition is true</p> <p>- 'condition': Boolean expression that determines whether the loop should continue executing.</p> <p>Control Flow Diagram: Start --&gt; Check condition --&gt; If true, execute code block --&gt; Check condition again --&gt; Repeat until condition becomes false --&gt; End</p> <p>Example: Print numbers from 1 to 5 using a while loop num = 1 while num &lt;= 5:     print(num)     num += 1</p>	3 2	5

	<p>In Python, exceptions are handled using the try, except, else, and finally blocks. The try block contains the code that may raise an exception, and the except block handles the exception if it occurs. Optionally, the else block can be used to execute code when no exception occurs, and the finally block is executed regardless of whether an exception occurs or not.</p> <p><b>**Example:**</b></p> <p>Consider a program that prompts the user to enter two numbers and performs division. We want to handle the possibility of division by zero and invalid input (non-numeric values).</p> <p>In the try block:</p> <ul style="list-style-type: none"> <li>- We prompt the user to enter two numbers.</li> <li>- We attempt to perform division.</li> </ul> <p>In the except block:</p> <ul style="list-style-type: none"> <li>- If a ZeroDivisionError occurs (i.e., the user inputs 0 as the second number), we print an error message indicating that division by zero is not allowed.</li> <li>- If a ValueError occurs (i.e., the user inputs non-numeric values), we print an error message indicating invalid input.</li> </ul> <p>In the else block:</p> <ul style="list-style-type: none"> <li>- If no exception occurs, we print the result of the division.</li> </ul> <p>In the finally block:</p> <ul style="list-style-type: none"> <li>- We print "End of program," which always executes regardless of whether an exception occurred or not.</li> </ul>		
4.	<p><b>Write a Python program to add n numbers accepted by the user.</b></p> <pre># Prompt the user to enter the value of n n = int(input("Enter the number of values you want to add: "))  # Initialize the sum to 0 total = 0  # Iterate 'n' times to accept 'n' numbers from the user for i in range(n):     num = float(input("Enter number {}: ".format(i + 1)))     total += num # Add the entered number to the total sum  # Print the total sum print("The sum of the {} numbers is: {}".format(n, total))</pre>	5	5
5.	<p><b>Discuss the List and Tuple data structure with examples for each.</b></p> <p><b>**List Data Structure:**</b></p> <p>A list in Python is a mutable, ordered collection of elements enclosed within square brackets '['']. It allows storing heterogeneous data types and supports various operations such as indexing, slicing, appending, and more.</p>	3 2	5



	<pre> ''' v) `insert()`: Inserts an element at the specified index.  Example: '''python my_list = [1, 2, 4] my_list.insert(2, 3) # Inserts 3 at index 2 print(my_list) # Output: [1, 2, 3, 4] ''' </pre>		
9.	<p><b>Develop a Python program to determine if a given string is palindrome or not</b></p> <pre> # Function to check if a string is palindrome def is_palindrome(s):     # Convert the string to lowercase and remove non-alphanumeric characters     s = ''.join(c.lower() for c in s if c.isalnum())     # Check if the string is equal to its reverse     return s == s[::-1]  # Accept a string from the user string = input("Enter a string: ")  # Check if the string is a palindrome if is_palindrome(string):     print("The given string is a palindrome.") else:     print("The given string is not a palindrome.") </pre>	5	5
10.	<p><b>For a= [ 'hello', 'how', [1,2,3], [10,20,30] ] what is the output of following statement</b></p> <ol style="list-style-type: none"> <li>i. <code>print(a[ : : ])</code></li> <li>ii. <code>print(a[-3][0])</code></li> <li>iii. <code>print(a[2][ : -1])</code></li> <li>iv. <code>print(a[0][ : : -1])</code></li> <li>v. <code>print(a[-1:-3])</code></li> </ol> <p>i. <code>print(a[::])</code>: This statement prints the entire list `a` without any modifications. Output: <code>`['hello', 'how', [1, 2, 3], [10, 20, 30]]`</code></p>	5	5

<p>ii. <code>print(a[-3][0])</code>: This statement accesses the first element of the third element of the list <code>a</code>. Output: <code>'h'</code></p> <p>iii. <code>print(a[2][:1])</code>: This statement accesses all elements except the last one from the third element of the list <code>a</code>. Output: <code>'[1, 2]'</code></p> <p>iv. <code>print(a[0][::-1])</code>: This statement accesses the first element of the list <code>a</code> and reverses it. Output: <code>'olleh'</code></p> <p>v. <code>print(a[-1:-3])</code>: This statement accesses elements from the last to the third last in the list <code>a</code>. Output: <code>'[]'</code> (since the slicing range <code>[-1:-3]</code> is empty)</p>		
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*Mahesh*

**Staff Signature:**

*Vagdev S*  
**HOD**

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**Department of Artificial Intelligence & Machine Learning**

**Sub: Introduction to Python Programming**

**Max marks:25**

**Sub code: BPLCK204B**

**Time: 10:30 -11.30 pm**

**Date: 26/06/2024**

**Second Internal test**

Q No.	Sub Q No.	Questions	Marks	CO's
<b>PART - A</b>				
1		With Code Snippet, Explain Saving Variables using the shelve module	5	CO3
<b>OR</b>				
2		Develop a program to sort the contents of a text file and write the sorted contents into a separate text file	5	CO3
<b>PART - B</b>				
3		Provide the syntax for opening, reading, writing, and closing a file. illustrate with Python program	5	CO3
<b>OR</b>				
4		What is logging? how this would be used to debug the Python program?	5	CO3
<b>PART - C</b>				
5		how to copy files and Folders using the shutil module. Provide an example.	5	CO4
<b>OR</b>				
6		Define Assertions. What does an assert statement in Python consist of	5	CO4
<b>PART - D</b>				
7		Define classes and objects with an example	5	CO5
<b>OR</b>				
8		Explain __init__ and str__ methods with an example	5	CO5
<b>PART - E</b>				
9		Define the below terms with an example a) Polymorphism b) Inheritance c) Method overriding	5	CO5
<b>OR</b>				
10		Write a Python class named Rectangle constructed by a length and width and a method that will compute the area of a rectangle.	5	CO5

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*Mahesh*

*Vagdevi*



**Department of Artificial Intelligence & Machine Learning**

**Sub: Introduction to Python Programming**

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**Time: 10:30 -11.30 pm**

**Date: 26/06/2024**

**Second Internal test-SCHEME**

Q No.	Sub Q No.	Questions	Marks	CO's
<i>PART - A</i>				
1		Explanation Example	2 marks 3 marks	5 CO3
OR				
2		Program with output	5 marks	5 CO3
<i>PART - B</i>				
3		syntax for opening, reading, writing, and closing a file. illustrate with Python program	4 marks 1 marks	5 CO3
OR				
4		Definition of logging Explanation	2 marks 3 marks	5 CO3
<i>PART - C</i>				
5		Explanation Example	3 marks 2 marks	5 CO4
OR				
6		Definition of Assertions. Explanation with example	2 marks 3 marks	5 CO4
<i>PART - D</i>				
7		Definition of classes and objects Example	2 marks 3 marks	5 CO5
OR				
8		Explanation <code>__init__</code> and <code>str__</code> methods Example	3 marks 2 marks	5 CO5
<i>PART - E</i>				
9		Definition of the below terms a) Polymorphism b) Inheritance c) Method overriding Example	3 marks 2 marks	5 CO5
OR				
10		Program with output	5 marks	5 CO5

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*Vignesh*

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**Max marks:25**

**Sub code: BPLCK204B**

**Time: 10:30 -11.30 pm**

**Date: 26/06/2024**

**Second Internal test**

Q No.	Sub Q No.	Questions	Marks	CO's
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**PART - A**

1		<p><b>Step-by-Step Explanation</b></p> <ol style="list-style-type: none"> <li><b>Import the shelve module:</b> <ul style="list-style-type: none"> <li>You need to import the <code>shelve</code> module to use it.</li> </ul> </li> <li><b>Open a shelf file:</b> <ul style="list-style-type: none"> <li>Use <code>shelve.open(filename)</code> to create or open a shelf file. This returns a dictionary-like object.</li> </ul> </li> <li><b>Store variables:</b> <ul style="list-style-type: none"> <li>Assign values to keys in the shelf object just like you would with a dictionary.</li> </ul> </li> <li><b>Close the shelf:</b> <ul style="list-style-type: none"> <li>It's important to close the shelf object to ensure all changes are written to the file.</li> </ul> </li> <li><b>Reopen the shelf to retrieve variables:</b> <ul style="list-style-type: none"> <li>Open the shelf file again and access the stored variables using their keys.</li> </ul> </li> </ol> <pre> import shelve  # Define some variables my_list = [1, 2, 3, 4, 5] my_dict = {'name': 'Alice', 'age': 30} my_string = "Hello, world!"  # Saving variables with shelve.open('my_shelf.db') as shelf:     shelf['list'] = my_list     shelf['dict'] = my_dict     shelf['string'] = my_string     print("Variables saved to the shelf.")  # Loading variables </pre>	5	CO3
---	--	--	---	-----

4	<p>Logging in Python is essential for debugging programs by recording information about their execution. It helps developers track the flow of operations, identify issues, and understand the state of variables at different points in the program. Python's `logging` module provides a flexible framework to emit log messages at different levels (DEBUG, INFO, WARNING, ERROR, CRITICAL), allowing developers to log messages that help diagnose problems or monitor the program's behavior. By configuring logging levels, formats, and destinations (such as consoles or files), developers can effectively debug Python programs by capturing relevant information and tracing program execution seamlessly.</p>	5	CO1
PART – C			
5	<p>To copy files and folders in Python, you can use the `shutil` module, which provides high-level file operations. Here's a brief example:</p> <pre> python import shutil  # Copy a file shutil.copy('source_file.txt', 'destination_file.txt')  # Copy a folder and its contents recursively shutil.copytree('source_folder', 'destination_folder') ...  ### Explanation: - **Copying a File**: - `shutil.copy('source_file.txt', 'destination_file.txt')`: Copies `source_file.txt` to `destination_file.txt`.  - **Copying a Folder**: - `shutil.copytree('source_folder', 'destination_folder')`: Recursively copies `source_folder` and all its contents to `destination_folder`.  ### Notes: - Ensure that the destination path exists before copying files or folders. - `shutil.copytree` will raise an error if the destination folder already exists unless `dirs_exist_ok=True` is provided as an argument.  This module simplifies the process of copying files and directories, making it straightforward to manage file operations in Python programs. </pre>	5	CO2
OR			
6	<p><b>**Assertions**</b> in Python are statements used to assert or ensure that conditions are true during the execution of a program. They are primarily used for debugging purposes to detect logical errors and ensure that assumptions made by the programmer are correct.</p> <p><b>### Assert Statement in Python:</b></p> <p>- An assert statement consists of:</p> <pre> python assert condition, message ... </pre> <p>- `condition`: A boolean expression that you expect to be true.</p> <p>- `message` (optional): An optional message that is displayed if the condition</p>	5	CO2

- **Usage**: It is used to initialize the object's attributes.

- **Example**:

```
python
class Car:
    def __init__(self, brand, model):
        self.brand = brand
        self.model = model

my_car = Car("Toyota", "Corolla")
'''
```

- In this example, `__init__` initializes the `brand` and `model` attributes of the `Car` class when `my_car` is created.

### `__str__` Method:

- **Purpose**: The `__str__` method is another special method in Python classes that is used to define the string representation of an object.

- **Usage**: It is automatically called when you use the `str()` function or `print()` function on an object.

- **Example**:

```
python
class Car:
    def __init__(self, brand, model):
        self.brand = brand
        self.model = model

    def __str__(self):
        return f'{self.brand} {self.model}'

my_car = Car("Toyota", "Corolla")
print(my_car) # Output: Toyota Corolla
'''
```

- In this example, `__str__` defines how the `Car` object should be represented as a string when printed.

### Summary:

- `__init__`: Initializes object attributes when an object is created.

- `__str__`: Defines the string representation of an object when printed or converted to a string.

	<p>c) Method Overriding</p> <p><b>**Definition**:</b> Method overriding occurs when a subclass provides a specific implementation of a method that is already provided by its parent class. It allows a subclass to modify or extend the behavior of the method defined in its superclass.</p> <p><b>**Example**:</b></p> <pre>python class Animal:     def sound(self):         print("Generic animal sound")  class Dog(Animal):     def sound(self):         print("Bark")  method overriding example my_dog = Dog() my_dog.sound() # Output: Bark</pre> <p>- In this example, `Dog` overrides the `sound` method inherited from `Animal` with its own implementation. When `sound` is called on a `Dog` object, it prints `Bark`</p>		
	OR		
10	<pre>class Rectangle:     def __init__(self, length, width):         self.length = length         self.width = width      def area(self):         return self.length * self.width  # Example usage rectangle1 = Rectangle(5, 4) print("Area of Rectangle 1:", rectangle1.area()) # Output: Area of Rectangle 1: 20  rectangle2 = Rectangle(7, 3) print("Area of Rectangle 2:", rectangle2.area()) # Output: Area of Rectangle 2: 21  ### Output: Area of Rectangle 1: 20 Area of Rectangle 2: 21</pre>	5	CO2



CITY ENGINEERING COLLEGE BENGALURU

Branch : AI

Semester : 2

Sl NO.	USN	BPLCK205B
1	1CE23AI001	25 (TH) , 22 (PR)
2	1CE23AI002	24 (TH) , 23 (PR)
3	1CE23AI003	25 (TH) , 23 (PR)
4	1CE23AI004	25 (TH) , 25 (PR)
5	1CE23AI005	25 (TH) , 25 (PR)
6	1CE23AI006	22 (TH) , 25 (PR)
7	1CE23AI007	25 (TH) , 25 (PR)
8	1CE23AI008	17 (TH) , 23 (PR)
9	1CE23AI009	25 (TH) , 23 (PR)
10	1CE23AI010	18 (TH) , 23 (PR)
11	1CE23AI011	18 (TH) , 22 (PR)
12	1CE23AI012	25 (TH) , 25 (PR)
13	1CE23AI013	13 (TH) , 20 (PR)
14	1CE23AI014	21 (TH) , 25 (PR)
15	1CE23AI015	16 (TH) , 23 (PR)
16	1CE23AI016	16 (TH) , 23 (PR)
17	1CE23AI017	25 (TH) , 25 (PR)
18	1CE23AI018	24 (TH) , 23 (PR)
19	1CE23AI019	21 (TH) , 25 (PR)
20	1CE23AI020	23 (TH) , 24 (PR)
21	1CE23AI021	22 (TH) , 24 (PR)
22	1CE23AI022	25 (TH) , 25 (PR)
23	1CE23AI023	17 (TH) , 23 (PR)
24	1CE23AI024	23 (TH) , 25 (PR)
25	1CE23AI025	15 (TH) , 25 (PR)
26	1CE23AI026	15 (TH) , 24 (PR)
27	1CE23AI027	25 (TH) , 25 (PR)
28	1CE23AI028	24 (TH) , 25 (PR)
29	1CE23AI029	24 (TH) , 25 (PR)
30	1CE23AI030	24 (TH) , 24 (PR)
31	1CE23AI031	19 (TH) , 21 (PR)
32	1CE23AI032	25 (TH) , 24 (PR)
33	1CE23AI033	23 (TH) , 25 (PR)
34	1CE23AI034	15 (TH) , 24 (PR)
35	1CE23AI035	19 (TH) , 25 (PR)
36	1CE23AI036	22 (TH) , 25 (PR)

## ATTENDANCE

Sl. No.	Reg.No.	Name	11	12	13	15	18	19	26	27	1	2	8	8	10	15	
			3	3	3	3	3	3	3	3	3	4	4	4	4	4	4
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	
1	1001 1CE23AI	Aaliya Zainab	1	1	2	3	3	4	5	6	6	6	7	8	9	9	
2		Akshata Patil	1	2	3	4	4	5	6	7	8	8	9	10	10	11	
3		Amlika D	1	2	3	4	5	5	6	7	8	9	9	10	11	12	
4		Anuj P Sai	1	2	3	3	4	5	6	7	8	9	10	11	12	13	
5		Ashik TK	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
6		Barani R	1	2	2	3	4	5	5	6	7	8	9	10	11	11	
7		Bharath R	1	2	3	4	5	6	7	8	8	9	10	11	12	13	
8		Bhuvan Shetty N	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
9		CM Advram	1	2	2	2	3	4	5	6	7	7	8	8	9	10	
10		Danyaa Shree	1	2	3	4	5	5	6	7	7	8	9	10	10	11	
11		Deepak J	1	2	3	4	5	5	6	7	8	9	10	11	12	13	
12		Gagan S	1	2	3	4	5	6	7	8	8	9	10	10	11	12	
13		Ganesh	1	1	2	3	3	3	4	4	5	6	6	7	8	9	
14		Gyusudh H	1	2	2	3	4	5	6	7	8	8	9	10	11	12	
15		Hari Prasad B	1	2	3	4	5	5	6	7	8	9	10	11	12	13	
16		Hrishvardhan GK	1	2	3	3	4	5	6	6	7	7	8	9	10	11	
17		Huzaiifa Ahmed SE	1	2	3	4	5	6	7	8	9	10	11	12	12	13	
18		Indubree N	1	2	3	4	5	6	7	7	8	9	10	11	12	13	
19		Jahnvi H	1	2	3	4	5	6	7	8	8	9	10	11	12	13	
20		Tejvan S	1	1	1	1	2	3	4	5	6	7	7	8	9	9	
21		Kishore Velayudhan	1	2	3	3	4	5	6	7	7	8	9	10	10	11	
22		Koushik M	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
23		Kushal TC	0	0	1	1	2	2	3	4	5	6	7	8	9	10	
24		MK Chandan	1	2	7	4	5	6	7	8	9	10	11	12	13	14	
25		Madesh N	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
		No. of Abs.															
		Initials															

## ATTENDANCE

Sl. No.	Reg.No.	Name
1	1001 1CE23AI	Aaliya Zainab
2	2	Akshata Patil
3	3	Amlika D
4	4	Anuj P Sai
5	5	Ashik TK
6	6	Borani . R
7	7	Bharath R
8	8	Bhuvan Shetty . N
9	9	CM Shivan
10	10	Danyaa Shree
11	11	Deepak . J
12	12	Gagan . S
13	13	Ganesh
14	14	Geethu . H
15	15	Hari Prasad . B
16	16	Hareharvardhan . GK
17	17	Huzaiifa Ahmed . SE
18	18	Indushree . N
19	19	Jahnvi . H
20	20	Jeevan . S
21	21	Kishore Velayudhan
22	22	Kaushik . M
23	23	Kushal . TC
24	24	MK . Chandan
25	25	Madesh . N
	No. of Abs.	
	Initials	

16	16	18	22	23	25	29	30	6	7	13	14	20	21	27
4	4	4	4	4	4	4	4	5	5	5	5	5	5	5
15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
10	11	11	12	13	14	15	16	16	17	18	19	20	21	22
12	13	14	15	16	17	18	19	19	20	21	22	23	24	25
13	14	14	15	15	16	17	18	19	19	20	21	21	22	23
14	15	16	17	18	19	20	21	22	22	23	24	25	26	27
15	16	16	17	18	19	20	21	21	22	23	24	25	26	27
11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
14	15	16	16	17	18	19	20	21	22	23	24	25	26	27
15	16	16	17	18	19	20	21	21	22	23	24	25	26	27
11	12	13	14	14	15	15	16	17	18	19	20	21	22	23
12	13	14	15	16	16	17	18	19	20	20	21	22	23	23
14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
13	14	14	15	16	16	17	18	19	20	21	22	23	24	25
9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
14	15	16	16	17	18	19	20	21	22	23	24	25	26	27
14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
14	14	15	16	16	17	18	19	20	21	22	23	24	24	25
14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
10	11	12	12	13	14	15	16	17	18	19	20	21	22	23
12	13	14	14	15	16	17	18	18	19	20	21	21	22	23
15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
11	11	11	12	13	14	15	16	17	18	19	20	21	22	23
15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
15	16	17	17	18	19	20	21	22	23	24	25	26	27	28



## ATTENDANCE

## ASSESSMENT

Sl. No.	Reg.No.	Name																	% of Attendance	Test Marks					Sessional Marks	Remarks
			45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60		IA	IA	Rec'd	Total			
																				1	2	3	(10)	(25)		
																50	50	50			(50)					
1	1001 1CE23RI	Aaliya Zainab																85	23	25	15	10	25	22	47	
2	2	Akshata Patil																91	20	25	14	10	24	23	47	
3	3	Amrta D																86	25	24	15	10	25	23	48	
4	4	Anuj P. Sai																96	25	22	15	10	25	25	50	
5	5	Ashik TK																96	24	24	15	10	25	25	50	
6	6	Barani R																91	16	22	12	10	22	25	47	
7	7	Bhavath R																96	23	24	15	10	25	25	50	
8	8	Bhuvan Shetty N																96	10	12	7	10	17	23	40	
9	9	CM Shivan																86	24	25	15	10	25	23	48	
10	10	Danya Shree																86	16	14	9	9	18	23	41	
11	11	Dyushk T																98	8	18	8	10	18	22	40	
12	12	Gagana S																91	25	25	15	10	25	25	50	
13	13	Ganesh																85	5	9	5	8	13	20	33	
14	14	Gyandev H																96	16	19	11	10	21	25	46	
15	15	Hari Prasad B																96	1	17	6	10	16	23	39	
16	16	Harshvardhan G																91	8	9	6	10	16	23	39	
17	17	Huzaiifa Ahmed SE																93	23	24	15	10	25	25	50	
18	18	Indubree N																96	21	25	14	10	24	23	47	
19	19	Jahnvi H																98	16	25	11	10	23	25	46	
20	20	Jeevan S																85	19	25	14	9	23	24	47	
21	21	Klshore Yelayudhan																85	23	18	13	9	22	24	46	
22	22	Koushik M																98	24	23	15	10	25	25	50	
23	23	Kushal TC																85	10	12	7	10	17	23	40	
24	24	MK Chandan																98	23	20	13	10	23	25	48	
25	25	Madesh N																98	11	5	5	10	15	24	39	
	No. of Abs.																	98	23	20	13	10	23	25	48	
	Initials																	98	11	5	5	10	15	24	39	

# RECORD OF CLASS WORK

Date	Period	Topics Covered
11/3/24	3	Python Basics: Shell, first program Strings, variables;
12/3/24	1	Boolean values, Operators, comparison
13/3/24	3	Flow control: IF, IF-ELSE, nested
15/3/24	3	Switch statement, break, None;
18/3/24	3	Looping: For, WHILE,
19/3/24	1	Importing modules, sys. module, function definition, syntax.
26/3/24	3	Function return values, return state -ments, Argument passing, None value
27/3/24	1	Local & global scope, Exception handling. Project: Guess the Number.
1/4/24	3	Lists: List datatype, working with Lists
2/4/24	1	Augmented assignment operators.
8/4/24	2	List methods.
8/4/24	3	Strings and Tuples.
10/4/24	3	Example: Magic 8 ball with a List.
15/4/24	1	Dictionary datatype
16/4/24	2 & 3	Dictionary datatype, Pretty printing
18/4/24	3	Working with strings, useful string
22/4/24	3	Project password locker, wiki markup
23/4/24	1	Reading & writing files, etc.
25/4/24	2	OS.path module, file read/write proc.
29/4/24	3	Saving variables with Shelve, Print formatter

Mahesh





# CITY ENGINEERING COLLEGE

Approved by AICTE New Delhi & Affiliated by VTU, Belagavi  
Doddakallasandra, Off Kanakapura Main Road,  
Next to Gokulam Apartment, Bangalore - 560 062.



## DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

### CIRCULAR

Ref No: CEC/AIML/DAC/ACY 2023-2024/01

Date: 18-08-2023

This is to inform the members of Department Advisory Committee that meeting is scheduled on 25-08-2023 at 11: 00 AM in HOD's office AIML Department.

#### Agenda:

- Conduct an orientation for 3<sup>rd</sup> semester students
- Planning of Internships for 5<sup>th</sup> semester students
- Involving students in technical activities
- Conducting workshop/seminar/guest lectures

CC TO

1. PRINCIPAL OFFICE-CEC

2. ALL MEMBERS

**HOD**

**HOD**  
Dept of Artificial Intelligence & Machine Learning  
CITY ENGINEERING COLLEGE  
Doddakallasandra, (Off) Kanakapura Road,  
Bangalore-560061





# CITY ENGINEERING COLLEGE

Approved by AICTE New Delhi & Affiliated by VTU, Belagavi  
Doddakallasandra, Off Kanakapura Main Road,  
Next to Gokulam Apartment, Bangalore - 560 062.



## DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

### Department Advisory Committee Meeting

**Date:** 25/08/2023

**Time:** 11:00 AM

**Venue:** HOD's office

DAC Members Present:

Sl. No	Member Name	Designation	Role	Signature
1	Dr. S Vagdevi	HOD	Convenor, HOD	
2	Mr. Praveen D	CTO, Dyashin Techno Soft Pvt. Ltd. Kanakapura Road, JP Nagar	Industry Expert	
3	Dr. Decphi V S	Asst. Professors, CSE & cybersecurity	Member	
4	Mrs. Vindhya R	Assistant Professor	Member	
5	Mr. Mahesh Basavaraj	Assistant Professor	Member	

The Department Advisory Committee meeting was conducted at Department of AIML, on 25<sup>th</sup> August, 2023, at 11 AM.

#### Agenda of the Meeting:

- Identify the gaps in the syllabus with respect to current trends prevailing in the industry
- Conduct technical events to meet the industrial needs.
- Exposure to usage of tools in courses of the semester
- Conducting Hands on workshop.
- Plans for faculty development and training.



# CITY ENGINEERING COLLEGE

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Doddakallasandra, Off Kanakapura Main Road,  
Next to Gokulam Apartment, Bangalore - 560 062.



## Minutes of Meeting:

During the Department Advisory Committee meeting, an overview of the department was provided, showcasing student achievement, and faculty and contributions. The members discussed suggestions for improvement and reviewed the meeting agenda.

The following points were discussed in the meeting:

- Committee members suggested establishing MOUs with various IT industries to provide students with internship opportunities.
- It was proposed to conduct a technical symposium with increased student participation.
- The committee decided to organize guest lecture, industry visit, and workshop for students in the 3rd, 5th, and 7th semesters.
- The HOD emphasized to Identify the gaps in the syllabus with respect to current trends prevailing in the industry, conduct technical events to meet the industrial needs.

*Vagdevi*  
[ Dr. S Vagdevi ]

HOD  
HOD  
Dept of Artificial Intelligence & Machine Learning  
CITY ENGINEERING COLLEGE  
Doddakallasandra, (Off) Kanakapura Road,  
Bangalore-560062



# ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ

("ವಿ ಆ ಯು ಅಧಿನಿಯಮ 1994"ರ ಅಡಿಯಲ್ಲಿ ಕರ್ನಾಟಕ ಸರ್ಕಾರದಿಂದ ಸ್ಥಾಪಿತವಾದ ರಾಜ್ಯ ವಿಶ್ವವಿದ್ಯಾಲಯ)

## VISVESVARAYA TECHNOLOGICAL UNIVERSITY

(State University of Government of Karnataka Established as per the VTU Act, 1994)

Phone : 0831-2498100 / 2405468

Fax : 0831-2405467

Email : registrar@vtu.ac.in

Web : https://vtu.ac.in

Reference: VTU/BGM/AC14/2023-24/5761

Date: 11 8 JAN 2024

### Revised-NOTIFICATION

**Subject:** Tentative Academic Calendar of 3rd semester of B.E./B. Tech. programs, regarding...

**Reference:** Hon'ble Vice-Chancellor's approval dated: 16.01.2024

The tentative academic calendar concerned to 3rd semester of B.E./B.Tech. programs, for academic year 2023-24 are hereby notified(revised) as mentioned below;

	III Semester B.E. / B. Tech. (2022 scheme)	III Semester B.E. / B. Tech. (2022 scheme)
Commencement of the Semester	15.11.2023	15.11.2023
Commencement of Classes	15.11.2023	15.11.2023
Last Working day of the Semester	20.02.2024	02.03.2024 (for lateral Entry Students only)
Practical Examination (Regular Students)	21.02.2024 To 29.02.2024	-----
Theory Examinations	04.03.2024 To 23.03.2024	04.03.2024 To 23.03.2024
Practical Examinations (For Lateral Entry Students)	---	25.03.2024 To 30.03.2024
Commencement of NEXT Semester	01.04.2024	01.04.2024

#### Please Note:

- If required, the college can plan to have extra classes on 1<sup>st</sup> and 3<sup>rd</sup> Saturday and Sundays to complete academic activities within the academic duration mentioned. For lateral entry students academic activities should be conducted up to 02.03.2024.
- The faculty/staff shall be available to undertake any work assigned by the university.

R



# ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ

("ವಿ ಜಿ ಯು ಅಧಿನಿಯಮ ೧೯೯೪" ರ ಅಡಿಯಲ್ಲಿ ಕರ್ನಾಟಕ ಸರ್ಕಾರದಿಂದ ಸ್ಥಾಪಿತವಾದ ರಾಜ್ಯ ವಿಶ್ವವಿದ್ಯಾಲಯ)

## VISVESVARAYA TECHNOLOGICAL UNIVERSITY

(State University of Government of Karnataka Established as per the VTU Act, 1994)

"JnanaSangama" Belagavi-590018, Karnataka, India

Prof. Dr. B. E. Rangaswamy, Ph.D.  
REGISTRAR

Phone: (0831) 2498100  
Fax : (0831) 2405467

REF: VTU/BGM/ACA/2023-24/ 3252

DATE: 30 SEP 2023

### NOTIFICATION

**Subject:** Tentative Academic Calendar of 1st semester of B.Sc(Hons) program, 3<sup>rd</sup> and 5<sup>th</sup> semester B.E./B.Tech. programs, 4<sup>th</sup> semester of MBA(IEV) program regarding...

**Reference:** Hon'ble Vice-Chancellor's approval dated: 30.09.2023

The tentative academic calendar concerned to 1st semester of B.Sc.(Hons) program, 3<sup>rd</sup> and 5<sup>th</sup> semesters B.E./B.Tech. programs, 4<sup>th</sup> semester of MBA(IEV) program for academic year 2023-24 are hereby notified as mentioned below;

	III semester B.E./B.Tech. (2022 scheme)	V semester B.E./ B.Tech. (2021 scheme)	I sem B.Sc(Hons)	IV semester MBA(IEV)*
Commencement of the Semester	25.10.2023	25.10.2023	03.10.2023	09.10.2023
Internship	----	25.10.2023 To 23.11.2023	---	----
Commencement of Classes	25.10.2023	25.11.2023	03.10.2023	09.10.2023
Last Working day of the Semester	10.02.2024	09.03.2024	25.01.2024	27.01.2024
Practical Examination/ Internship Viva Voce/ Project viva	12.02.2024 To 22.02.2024	11.03.2024 To 20.03.2024	29.01.2024 To 09.02.2024	01.02.2024 To 08.02.2024
Theory Examinations	26.02.2024 To 15.03.2024	22.03.2024 To 20.04.2024	12.02.2024 To 01.03.2024	
Commencement of NEXT Semester	18.03.2024	22.04.2024	04.03.2024	-----

\*Students have to complete skill certification and Internship within this duration (09.10.2023 to 27.01.2024)



# ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ

(ವಿಜಯ ಅಧಿನಿಯಮ ೧೯೯೪ ರ ಅಡಿಯಲ್ಲಿ ಕರ್ನಾಟಕ ಸರ್ಕಾರದಿಂದ ಸ್ಥಾಪಿತವಾದ ರಾಜ್ಯ ವಿಶ್ವವಿದ್ಯಾಲಯ)

## VISVESVARAYA TECHNOLOGICAL UNIVERSITY

(State University of Government of Karnataka Established as per the VTU Act, 1994)  
"JnanaSangama" Belagavi-590018, Karnataka, India

Prof. Dr. B. E. Rangaswamy, Ph.D.  
REGISTRAR

Phone: (0831) 2498100  
Fax : (0831) 2405467

REF: VTU/BGM/ACA/2023-24/ 2668

DATE: 25 AUG 2023

### NOTIFICATION

- Subject:** Tentative Academic Calendar of 1st semesters of B.E./B.Tech./B.Arch./B.Plan., and VII semester of B.E./B.Tech., programs of University regarding...
- Reference:** Dean faculty of Engineering, VTU Belagavi approval dated 24.08.2023  
Hon'ble Vice-Chancellor's approval dated: 24.08.2023

The tentative academic calendar concerned to 1st semesters of B.E./B.Tech./B.Arch./B.Plan., and VII semester of B.E./B.Tech., programs of University for academic year 2023-24 are hereby notified as mentioned below;

	I semester B.E./B.Tech (2022 scheme)	I semester B.Plan/B.Arch (2022 scheme)	VII semester B.E./B.Tech (2018 scheme)
Commencement of the Semester	04.09.2023	04.09.2023	14.08.2023
# Internship/Students Induction Program	04.09.2023 To 14.09.2023	04.09.2023 To 14.09.2023	14.08.2023 To 09.09.2023
Commencement of Classes	15.09.2023	15.09.2023	11.09.2023
Last Working day of the Semester	06.01.2024	06.01.2024	06.01.2024
Practical Examination	08.01.2024 To 19.01.2024	08.01.2024 To 19.01.2024	08.01.2024 To 19.01.2024
Theory Examinations	22.01.2024 To 17.02.2024	22.01.2024 To 17.02.2024	22.01.2024 To 09.02.2024
Commencement of NEXT Semester	19.02.2024	19.02.2024	13.02.2024

# Internship for VI semester completed students and Students Induction Program for 1<sup>st</sup> semester Students

#### Please Note:

- The academic sessions for ODD semesters should commence on the date mentioned above.



## CITY ENGINEERING COLLEGE, BENGALURU-560061. ACADEMIC CALENDAR 2023-24 Odd SEM

October 2023		November 2023		December 2023		January 2024		February 2024		March 2024		April 2024			
DAY	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	
SUN	1														
MON	2	GANDHI JAYANTHI					1	II test for 1st sem , III test for VII sem, I st test V sem					1		
TUE	3						2							2	
WED	4		1	RAJYOTSAVA DAY			3							3	
THU	5		2				4		1				4		
FRI	6		3		1		5		2		1		5		
SAT	7	1st Saturday holiday	4	1st Saturday holiday	2	1st Saturday holiday	6	Last Working Day I & 7	3	1st Saturday holiday	2	1st Saturday holiday	6	1st Saturday holiday	
SUN	8		5		3		7		4		3		7		
MON	9		6	Ist test I sem and VII sem	4	II nd test VII sem, I st test III sem	8	Practical Exam I , 7	5	2nd test 3 <sup>rd</sup> sem V sem,	4	III test for V sem	8	Ugadhi, Ramzan	
TUE	10		7		5		9	6	7		10				
WED	11		8		6		10	7	11						
THU	12		9		7		11		8		7		11		
FRI	13		10		8		12		9		8	Maha Shivarathri	12		
SAT	14	MAHALAYA AMAVASA	11		9		13		10	Last working day-3rd	9	Last working day-5th	13		
SUN	15		12		10		14		11		10		14		
MON	16		13		11		15	Sankranthi	12	Start of practical 3 rd	11	Start of practical 5th	15		
TUE	17		14	BALIPADYAMI	12		16		13	Start of 8th sem	12		16		
WED	18		15		13		17		14		13		17		
THU	19		16		14		18		15		14		18		
FRI	20		17		15		19		16		15		19		
SAT	21	3rd Saturday holiday	18	3rd Saturday holiday	16	3rd Saturday holiday	20	3rd Saturday holiday	17	3rd Saturday holiday	16	3rd Saturday holiday	20	3rd Saturday holiday	
SUN	22		19		17		21		18		17		21		
MON	23	AYUDHA POOJA	20		18		22	THEORY EXAM 1 & 7	19	Start of 2 <sup>nd</sup> sem	18	Start of 4th sem	22	Start of 6th sem	
TUE	24	VIJAYA DASHAMI	21		19		23		20		19		23		
WED	25	Start of 5th sem INTERNSHIP ,3rd sem	22		20		24		21		20		24		
THU	26		23		21		25		22		21		25		
FRI	27		24		22		26	Republic day	23		22	Start of theory 5th	26		
SAT	28	VALMIKI JAYANTHI	25	Start of 5th sem class	23		27		24		23		27		
SUN	29		26		24		28		25		24		28		
MON	30		27		25	CHRISTMAS	29		26	Start of theory 3rd	25	Holi	29		
TUE	31		28		26		30		27		26		30		
WED			29		27		31		28		27				
THU			30	KANAKADASA JAYANTHI	28				29		28				
FRI					29						29	Good Friday			
SAT					30						30				
SUN					31						31				

**CITY ENGINEERING COLLEGE, BENGALURU-560061. ACADEMIC CALENDAR Dept. of AIML 2023-24 Odd SEM**

DAY	OCT 2023		NOV 2023		DEC 2023		JAN 2024		FEB 2024		March 2024		April 2024			
	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT		
SUN	1															
MON	2	GANDHI JAYANTHI					1	II test for I st sem ,					1	Start of 4th sem		
TUE	3						2	III test for VII sem,					2			
WED	4		1	RAJYOTSAVA DAY			3	I st test V sem, &					3			
THU	5		2				4	III sem	1				4			
FRI	6		3		1		5		2		1		5			
SAT	7	1st Saturday holiday	4	1st Saturday holiday	2	Alumni Meet 1st Saturday holiday	6	Last Working day I & 7	3	1st Saturday holiday	2	1st Saturday holiday	6	1st Saturday holiday		
SUN	8		5		3		7		4		3		7			
MON	9		6	I st test I sem and VII sem	4	II nd test VII sem, ATAL FDP – Basic (4 <sup>th</sup> – 9 <sup>th</sup> Dec)	8	Practical Exam I, 7	5	2nd test 3 <sup>rd</sup> sem V sem,	4	III test for V sem, Start of theory 3 <sup>rd</sup>	8			
TUE	10		7		5		9		6				5		9	Ugadhi, Ramzan
WED	11		8		6		10		7				6		10	
THU	12		9		7		11		8				7		11	
FRI	13		10		8		12	Workshop for III Sem	9				8		12	Maha Shivarathri
SAT	14	MAHALAYA AMAVASA	11		9		13		10		9	Last working day- 5th	13			
SUN	15		12		10		14		11		10		14			
MON	16		13		11	ATAL FDP Advanced (11 <sup>th</sup> – 16 <sup>th</sup> Dec)	15	Sankranthi	12		11	Start of practical 5th	15			
TUE	17		14	BALIPADYAMI	12		16		13	Start of 8th sem	12		16			
WED	18		15	Start of 3rd sem	13		17		14		13		17			
THU	19		16		14		18		15		14		18			
FRI	20		17		15		19		16	Guest Lecture	15		19			
SAT	21	3rd Saturday holiday	18	Graduation Day 3rd Saturday holiday	16	3rd Saturday holiday	20	3rd Saturday holiday	17	3rd Saturday holiday	16	3rd Saturday holiday	20	3rd Saturday holiday		
SUN	22		19		17		21		18		17		21			
MON	23	AYUDHA POOJA	20		18		22	THEORY EXAM I & 7	19	Start of 2 <sup>nd</sup> sem	18		22	Start of 6th sem Tech Talk		
TUE	24	VIJAYA DASHAMI	21		19		23		20	Last working day- 3rd	19		23			
WED	25	Start of 5th sem INTERNSHIP	22		20		24		21	Start of practical 3rd	20		24	Tech talk		
THU	26		23		21		25	Industrial Visit – V sem	22		21		25			
FRI	27		24		22		26	Republic day	23		22	Start of theory 5th	26			
SAT	28	VALMIKI JAYANTHI	25	Start of 5th sem class	23		27		24		23		27			
SUN	29		26		24		28		25		24		28			
MON	30		27		25	CHRISTMAS	29		26		25	Holi	29			
TUE	31		28		26		30		27		26		30			
WED			29		27		31		28		27					
THU			30	KANAKADASA JAYANTHI	28				29		28					
FRI					29	Tech Symposium					29	Good Friday				
SAT					30						30					
SUN					31						31					



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ACADEMIC YEAR:2023-24

## DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

### COURSE PREFERENCE

Name of the Faculty: Mrs. Vindhya R

Designation: Asst. Professor

Sl. No	Course Code and Name	Year/Semester
1.	18AI71-ADVANCED ARTIFICIAL INTELLIGENCE	4 <sup>th</sup> /7 <sup>th</sup>
2.	BETCK105H-INTRODUCTION TO INTERNET OF THINGS (IOT)	1 <sup>st</sup> /1 <sup>st</sup>
3.	21CS51-AUTOMATA THEORY AND COMPILER DESIGN	3 <sup>rd</sup> /5 <sup>th</sup>

Signature of Faculty





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## Department of Artificial Intelligence and Machine Learning

Subject Allotment: ODD SEMESTER

Academic Year-2023-24

SL. NO.	Name of the Faculty	Course code and name	Year /semester	Signature
1	Dr. S Vagdevi	18AI744- BUSINESS INTELLIGENCE	4 <sup>th</sup> /7 <sup>th</sup>	
2	Mrs. Vindhya R	21CS51-AUTOMATA THEORY AND COMPILER DESIGN BETCK105H-INTRODUCTION TO INTERNET OF THINGS (IOT) 18AI71-ADVANCED ARTIFICIAL INTELLIGENCE 21AI56-RESEARCH METHODOLOGY AND INTELLECTUAL PROPERTY RIGHTS	3 <sup>rd</sup> /5 <sup>th</sup> 1 <sup>st</sup> /1 <sup>st</sup> 4 <sup>th</sup> /7 <sup>th</sup> 3 <sup>rd</sup> /5 <sup>th</sup>	
3	Mr. Mahesh Basavaraj	BPOPS103-PRINCIPLES OF PROGRAMMING USING C, 18AI72-ADVANCED MACHINE LEARNING 18AIL76-AI & ML APPLICATION DEVELOPMENT LABORATORY 21CSL581- ANGULAR JS AND NODE JS	1 <sup>st</sup> /1 <sup>st</sup> 4 <sup>th</sup> /7 <sup>th</sup> 3 <sup>rd</sup> /5 <sup>th</sup> 3 <sup>rd</sup> /5 <sup>th</sup>	
4	Mrs. Anusha Shivaprakash	18AI733- BLOCKCHAIN TECHNOLOGY BAI303- OPERATING SYSTEMS	4 <sup>th</sup> /7 <sup>th</sup> 2 <sup>nd</sup> /3 <sup>rd</sup>	
5	Mrs. Jayashree Badiger	BAI302- DIGITAL DESIGN & COMPUTER ORGANISATION 21CS53- DATABASE MANAGEMENT SYSTEMS 18AIP77- PROJECT PHASE 1	2 <sup>nd</sup> /3 <sup>rd</sup> 3 <sup>rd</sup> /5 <sup>th</sup> 4 <sup>th</sup> /7 <sup>th</sup>	
6	Ms. Maheshwari Patil	BAI304- DATA STRUCTURES & ITS APPLICATIONS BAIL305- DATA STRUCTURES Lab 21AI54-PRINCIPLES OF AI BYOK459-YOGA	2 <sup>nd</sup> /3 <sup>rd</sup> 2 <sup>nd</sup> /3 <sup>rd</sup> 3 <sup>rd</sup> /5 <sup>th</sup> 2 <sup>nd</sup> /3 <sup>rd</sup>	
7	Ms. Nasrath B K	BAI306C- DATA ANALYSIS USING R	2 <sup>nd</sup> /3 <sup>rd</sup>	



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		21CS52-COMPUTER NETWORKS BAI358B -DATA ANALYSIS USING EXCEL	3 <sup>rd</sup> /5 <sup>th</sup> 2 <sup>nd</sup> /3 <sup>rd</sup>	<i>AS</i>
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*Vagdevi*

**Dr. S Vagdevi**

**HOD**

**HOD**

Dept of Artificial Intelligence & Machine Learning  
CITY ENGINEERING COLLEGE  
Doddakallasandra, (Off) Kanakapura Road,  
Bangalore-560061



**CITY ENGINEERING COLLEGE**

Department of AI & ML

III SEM

Time Table for ODD SEM AY 2023-2024

W.E.F. 15/11/2023

Room:402

0DAY	09:00- 10:00 AM	10:00 - 11:00 AM		11:10- 12:15 PM	12:15 - 01:15 PM		02:00 - 03:00 PM	03:00 - 04:00 PM	04:00 - 05:00 PM		
MON	MAT AS	OS ASP	Short Break	DDCO JB	DS MP	Lunch Break	MAT (T) AS				
TUE	DS MP	MAT AS		R NBK	DS MP		← OS-A1/ R-A2 → ASP & MP/ NBK				
WED	MAT AS	DDCO JB		← DS-A1/EXCELA2 → MP&JB/ASP & NBK			← SCR →				
THU	DDCO JB	OS ASP		← DS-A2/EXCELA1 → MP&JB/ASP & NBK			← OS-A2/ R-A1 → ASP & MP/ NBK				
FRI	← DDCO A1 →			OS ASP	R NBK		← DDCO A2 →				
SAT	NSS/PHY EDU/ YOGA			DEPARTMENT ACTIVITIES							

Sl . No	Course Code	Course Name	Course	Faculty Name	Credits
1	BAI301	MATHEMATICS FOR AI & ML	MAT	Mrs Anitha	4
2	BAI302	DIGITAL DESIGN & COMPUTER ORGANISATION	DDCO	Mrs Jayashree Badiger (JB)	4
3	BAI303	OPERATING SYSTEMS	OS	Mrs Anusha Shivaprakash (ASP)	4
4	BAI304	DATA STRUCTURES B & ITS APPLICATIONS	DSA	Ms Maheshwari Patil (MP)	3
5	BAIL305	DATA STRUCTURES LABORATORY	DSAL	Ms Maheshwari Patil (MP)	1
6	BAI306C	DATA ANALYSIS USING R	R LAB	Mrs Nasrath B K	3
7	BSCK307	SOCIAL CONNECT & RESPONSIBILITY	SCR	Ms Meghana	1
8	BAI358B	DATA ANALYSIS USING EXCEL	DAE	Mrs Anusha Shivaprakash / Mrs Nasrath B K	1
9	BYSK359	YOGA	YOGA	Ms Maheshwari Patil (MP)	0

*Anp*  
Class Teacher: Mrs Anusha Shivaprakash

*Vagdevi*  
HOD  
HOD

*Principals*  
Principal

Dept of Artificial Intelligence & Machine Learning  
CITY ENGINEERING COLLEGE  
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# CITY ENGINEERING COLLEGE

Department of AI & ML

W.E.F: 25/11/2023

V SEM

Time Table for ODD SEM AY 2023-2024

Room: 401

DAY	09:00 – 10:00 AM	10:00 – 11:00 AM		11:15 – 12:15 PM	12:15 – 01:15 PM		02:00 – 03:00 PM	03:00 – 04:00 PM	04:00 – 05:00 PM	
MON	DBMS JB	CN NBK	Short Break	CN-A1/A2 NBK		Lunch Break	DBMS -A1/A2 JB			
TUE	DBMS JB	CN NBK		PAI MP	ATC VR		DEPARTMENTAL ACTIVITIES			
WED	← AJS A1 & A2 → ASP/MB			ATC VR	PAI MP		INTERNSHIP			
THU	CN NBK	ATC VR		DBMS JB	EVS VK					
FRI	PAI MP	RIPR VR		AJ(T) MB/ASP			RIPR VR			
SAT	LIBRARY			MENTORING						

Sl. No	Course Code	Course Name	Course	Faculty Name	Credits
1	21CS51	AUTOMATA THEORY AND COMPILER DESIGN	ATC	Mrs Vindhya R (VR)	3
2	21CS52	COMPUTER NETWORKS	CNS	Mr Nasrath (NBK)	4
3	21CS53	DATABASE MANAGEMENT SYSTEMS	DBMS	Mrs Jayashree Badiger (JB)	3
4	21AI54	PRINCIPLES OF AI	PAI	Ms Maheshwari Patil (MP)	3
5	21CSL55	DATABASE MANAGEMENT SYSTEMS LABORATORY WITH MINIPROJECT	DBMSL	Mrs Jayashree Badiger	1
6	21AI56	RESEARCH METHODOLOGY AND INTELLECTUAL PROPERTY RIGHTS	RIPR	Mrs Vindhya R (VR)	2
7	21CIV57	ENVIRONMENTAL STUDIES	EVS	Mr Vinay Kumar	1
8	21CSL581	ANGULAR JS AND NODE JS	AJS	Mr Mahesh Basavaraj/Mrs Anusha Shivaprakash	1

Class Teacher: Mr Mahesh Basavaraj

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# CITY ENGINEERING COLLEGE

Department of AI & ML

W.E.F: 09/10/2023

VII SEM

Time Table for ODD SEM AY 2023-2024

Room:403

DAY	09:00- 10:00 AM	10:00 - 11:00 AM		11:15- 12:15 PM	12:15 - 01:15PM		02:00 - 03:00 PM	03:00 - 04:00 PM	04:00 - 05:00 PM	
MON	AML MB	OE HE	Short Break	BI Dr SV	BI Dr SV	Lunch Break				
TUE	AAI VR	BT ASP		AAI VR	MENTORING					
WED	BT ASP	AML MB		OE HE	OE HE		← PROJECT WORK →			
THU	AAI VR	AML MB		BI Dr SV	BT ASP		← INTERNSHIP →			
FRI	← AML LAB MB →			AAI VR	AML MB					
SAT	MENTOR MENTEE INTERACTION									

Sl . No	Course Code	Course Name	Course	Faculty Name
1	18AI71	ADVANCED ARTIFICIAL INTELLIGENCE	AAI	Mrs Vindhya R
2	18AI72	ADVANCED MACHINE LEARNING	AML	Mr Mahesh Basavaraj
3	18AI733	BLOCKCHAIN TECHNOLOGY	BT	Mrs Anusha Shiva Prakash
4	18AI744	BUSINESS INTELLIGENCE	BI	Dr S Vagdevi
5	18ME751	ENERGY & ENVIRONMENT	E&E	Mr Harshavardhan
6	18AIL76	AI & ML APPLICATION DEVELOPMENT LABORATORY	AI & ML LAB	Mr Mahesh Basavaraj / Ms Maheshwari
7	18AIP77	PROJECT PHASE 1	PROJECT	Mrs. Jayshree Badiger/Mrs. Vindhya R

*Vindhya R*  
Class Teacher: Vindhya R

*Vagdevi S*  
HOD  
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# COURSE FILE

AY 2023-2024 ODD SEMESTER

Name: Mrs. Vindhya R

Designation: Asst. Professor

Subject Name: Advance Artificial  
Intelligence



# CITY ENGINEERING COLLEGE

Department of AI & ML

Time Table for ODD SEM AY 2023-2024

INDIVIDUAL TIME TABLE

Faculty Name: Mrs. Vindhya R

DAY	09:00 – 10:00 AM	10:00 – 11:00 AM		11:15 – 12:15 AM	12:15 – 01:15PM		02:00 – 03:00 PM	03:00 – 04:00 PM	04:00 – 05:00 PM
MON	IOT VR					Lunch Break			
TUE	AAI VR			AAI VR	ATC VR		R Lab-A2		
WED		IOT VR		ATC VR					
THU	AAI VR	ATC VR					R Lab-A1		
FRI	IOT VR	RIPR VR		AAI VR			RIPR VR		
SAT									

Sl. No	Course Code	Course Name	THEORY	TUTORIALS	PRACTICALS	UNITS
1	18AI71	ADVANCED ARTIFICIAL INTELLIGENCE	4			4
2	21CS51	AUTOMATA THEORY AND COMPILER DESIGN	3			3
3	BETCK105H	INTRODUCTION TO INTERNET OF THINGS (IOT)	3			3
4	BAI306C	DATA ANALYSIS USING R		2*2		4
5	21AI56	RESEARCH METHODOLOGY AND INTELLECTUAL PROPERTY RIGHTS	2			2
<b>TOTAL</b>						16

*Vagdekar*

HOD

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**VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI**  
**Artificial Intelligence and Machine Learning (AI)**  
 Scheme of Teaching and Examinations  
 Outcome Based Education (OBE) and Choice Based Credit System (CBCS)  
 (Effective from the academic year 2018 - 19)

**VII SEMESTER**

Sl. No	Course and Course code		Course Title	Teaching Department	Teaching Hours /Week			Examination			Credits	
					Theory Lecture	Tutorial	Practical/ Drawing	Duration in hours	CIE Marks	SEE Marks		Total Marks
					L	T	P					
1	PCC	18AI71	Advanced Artificial Intelligence	CS / IS / AI	4	--	--	03	40	60	100	4
2	PCC	18AI72	Advanced Machine Learning	CS / IS / AI	4	--	--	03	40	60	100	4
3	PEC	18AI73X	Professional Elective - 2	CS / IS / AI	3	--	--	03	40	60	100	3
4	PEC	18AI74X	Professional Elective - 3	CS / IS / AI	3	--	--	03	40	60	100	3
5	OEC	18AI75X	Open Elective -B	CS / IS / AI	3	--	--	03	40	60	100	3
6	PCC	18AIL76	AI and ML Application Development Laboratory	CS / IS / AI	--	--	2	03	40	60	100	3
7	Project	18AIP77	Project Work Phase - 1	CS / IS / AI	--	--	2	03	40	60	100	1
	INT	--	Internship		--	--	2	--	100	--	100	2
(If not completed during the vacation of VI and VII semesters, it has to be carried out during the intervening vacations of VII and VIII semesters)												
<b>TOTAL</b>					<b>17</b>	<b>--</b>	<b>4</b>	<b>18</b>	<b>340</b>	<b>360</b>	<b>700</b>	<b>20</b>

**Note: PCC: Professional core, PEC: Professional Elective, OEC: Open Elective, INT: Internship.**

**Professional Elective - 2**

Course code under 18CS73X	Course Title	Course Code	Course Title
18AI731	Internet of Things	18AI733	Blockchain Technology
18AI732	Multiagent Systems	18AI734	Cloud Computing and Virtualization

**Professional Electives - 3**

Course code under 18CS74X	Course Title	Course Code	Course Title
18AI741	Fuzzy Logic & its Applications	18AI743	Semantic Web and Social Network
18AI742	Computer Vision	18AI744	Business Intelligence

**Open Elective -B (18CS75x are not to be opted by CSE / ISE / AIML Programs)**

18CS751	Introduction to Big Data Analytics
18CS752	Python Application Programming
18CS753	Introduction to Artificial Intelligence
18CS754	Introduction to Dot Net framework for Application Development

Students can select any one of the open electives offered by any Department (Please refer to the list of open electives under 18CS75X). Selection of an open elective is not allowed provided,

- A candidate has studied the same course during the previous semesters of the programme.
- The syllabus content of open elective is similar to that of Departmental core courses or professional electives.
- A similar course, under any category, is prescribed in the higher semesters of the programme.
- Registration to electives shall be documented under the guidance of Programme Coordinator/ Adviser/Mentor.

**Project work:** Based on the ability/abilities of the student/s and recommendations of the mentor, a single discipline or a multidisciplinary project can be assigned to an individual student or to a group having not more than 4 students. In extraordinary cases, like the funded projects requiring students from different disciplines, the project student strength can be 5 or 6.

**CIE procedure for Project Work Phase - I:**

(i) **Single discipline:** The CIE marks shall be awarded by a committee consisting of the Head of the concerned Department and two senior faculty members of the Department, one of whom shall be the Guide. The CIE marks awarded for the project work phase -1, shall be based on the evaluation of the project work phase -1 Report (covering Literature Survey, Problem identification, Objectives and Methodology), project presentation skill and question and answer session in the ratio 50:25:25. The marks awarded for the Project report shall be the same for all the batch mates.

(ii) **Interdisciplinary:** Continuous Internal Evaluation shall be group wise at the college level with the participation of all guides of the college. Participation of external guide/s, if any, is desirable. The CIE marks awarded for the project work phase -1, shall be based on the evaluation of project work phase -1 Report, project presentation skill and question and answer session in the ratio 50:25:25. The marks awarded for the project report shall be the same for all the batch mates.

**Internship:** All the students admitted to III year of BE/B.Tech shall have to undergo mandatory internship of 4 weeks during the vacation of VI and VII semesters and /or VII and VIII semesters. A University examination shall be conducted during VIII semester and the prescribed credit shall be included in VIII semester. Internship shall be considered as a head of passing and shall be considered for the award of degree. Those, who do not takeup/complete the internship shall be declared fail and shall have to complete during subsequent University examination after satisfying the internship requirements

**AICTE activity Points:** In case students fail to earn the prescribed activity Points. Eighth semester Grade Card shall be issued only after earning the required activity



**ADVANCED ARTIFICIAL INTELLIGENCE**  
(Effective from the academic year 2018 -2019)  
**SEMESTER – VII**

<b>Subject Code</b>	18AI71	<b>CIE Marks</b>	40
<b>Number of Contact Hours/Week</b>	4:0:0	<b>SEE Marks</b>	60
<b>Total Number of Contact Hours</b>	50	<b>Exam Hours</b>	3 Hrs

**CREDITS –4**

**Course Learning Objectives:** This course will enable students to:

- Demonstrate the fundamentals of Intelligent Agents
- Illustrate the reasoning on Uncertain Knowledge
- Explore the explanation based learning in solving AI problems
- Demonstrate the applications of Rough sets and Evolutionary Computing algorithms

**Module 1**

<b>Intelligent Agents: Agents and Environments, Good Behavior: The Concept of Rationality, The Nature of Environments, The Structure of Agents Problem Solving ;Game Paying</b> <b>T1: Chapter 2, Chapter 5 (2.1 to 2.4, 5.1 to 5.6)</b>	<b>Contact Hours</b> 10
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**Module 2**

<b>Uncertain knowledge and Reasoning: Quantifying Uncertainty, Acting under Uncertainty , Basic Probability Notation, Inference Using Full Joint Distributions, Independence , Bayes' Rule and Its Use The Wumpus World Revisited,</b> <b>T1: Chapter 13</b>	10
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**Module 3**

<b>Probabilistic Reasoning, Representing Knowledge in an Uncertain Domain, The Semantics of Bayesian Networks , Efficient Representation of Conditional Distributions Exact Inference in Bayesian Networks, Approximate Inference in Bayesian Networks.</b> <b>T1: Chapter 14</b>	10
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**Module 4**

<b>Perception: Image Formation, Early Image-Processing Operation, Object Recognition by Appearance, Reconstructing the 3D World. Object Recognition from Structural Information, Using Vision</b> <b>T1: Chapter 24</b>	10
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**Module 5**

<b>Overview and language modeling: Overview: Origins and challenges of NLP-Language and Grammar-Processing Indian Languages- NLP Applications-Information Retrieval. Language Modeling: Various Grammar- based Language Models-Statistical Language Model.</b> <b>T2: Chapter 1, 2</b>	10
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**Course Outcomes:** The student will be able to :

- Demonstrate the fundamentals of Intelligent Agents
- Illustrate the reasoning on Uncertain Knowledge

- Explore the explanation based learning in solving AI problems
- Demonstrate the applications of Rough sets and Evolutionary Computing algorithms

**Question Paper Pattern:**

- The question paper will have ten questions.
- Each full Question consisting of 20 marks
- There will be 2 full questions (with a maximum of four sub questions) from each module.
- Each full question will have sub questions covering all the topics under a module.
- The students will have to answer 5 full questions, selecting one full question from each module.

**Textbooks:**

1. **Artificial Intelligence, A Modern Approach**, Stuart J. Russell and Peter Norvig, Third Edition, Pearson, 2010
2. Tanveer Siddiqui, U.S. Tiwary, "Natural Language Processing and Information Retrieval", Oxford University Press, 2008.

**Reference Books:**

1. **An Introduction to Multi Agent Systems**, Michael Wooldridge, Second Edition, John Wiley & Sons



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## CITY ENGINEERING COLLEGE

OFF KANAKAPURA ROAD, DODDAKALLASANDRA, BANGALORE 560062

DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

STUDENT LIST OF VII SEMESTER AY 23-24

Sl. No.	USN	Name
1	1CE20AI001	ABDUL FAHEEM
2	1CE20AI002	HAJIRA AHMED
3	1CE20AI003	KEDAR JOSHI
4	1CE20AI004	KOKILA K R
5	1CE20AI006	SHARON ZIPPORAH SEBASTIAN
6	1CE20AI007	SHARONA SAM
7	1CE20AI008	SUHAS GAJANANA
8	1CE20AI009	SYEDA ALIYAH BAKSHI

HOD  
Dept of Artificial Intelligence & Machine Learning  
CITY ENGINEERING COLLEGE  
Doddakallasandra, Off Kanakapura Road,  
Bangalore-560062

Principal

PRINCIPAL  
CITY ENGINEERING COLLEGE  
Kanakapura Main Road, BANGALORE - 560 061

# LESSON PLAN

Week	Date		Topics Planned
	From	To	
I	02/10/2023	07/10/2023	<p style="text-align: center;">MODULE 1</p> Introduction, Revision of AI concepts, Agents & Environments, Good Behavior: Concept of Rationality, Nature of Environments, Structure of Agents.
II	09/10/2023	14/10/2023	Introduction to Game playing, optimal decisions in Games, Minimax algorithms, solving examples, Alpha Beta pruning, move ordering, Ex solving, Imperfect real-time decisions.
III	16/10/2023	21/10/2023	Stochastic games, Partially observable games, Model paper discussion.
IV	23/10/2023	28/10/2023	<p style="text-align: center;">MODULE-2</p> Quantifying uncertainty, & acting under uncertainty, Ex, prob notation, associated problems
V	30/10/2023	04/11/2023	Random variable, Associated problems, Random variable, PDF, associated problem, Inference, JP distribution, associated problem, Independence, Bayes rule & its use, Applying Bayes Rule.
VI	06/11/2023	11/11/2023	Using Bayes Rule, Associated problems, Mumpus world theory & Explanation, Derivation, Model paper discussion.
VII	13/11/2023	18/11/2023	<p style="text-align: center;">MODULE-3 :</p> Semantics of Bayesian n/w, Representing full joint distribution, Conditional Independence, Prob, Efficient rep'n of conditional dist'n, Exact inference, Complexity, clustering algorithm.
VIII	20/11/2023	25/11/2023	Exact inference in BN, variable elimination alg, Problems, clustering algorithm, approximate inference in BN, Direct sampling, likelihood weighting.
VIII	29/11/2023	25/11/2023	Inference by Markov chain Implementation, associated problems, Model paper.
			<p style="text-align: center;">MODULE - 4</p> Intro to Image processing, Revision, Image formation, Early image processing.

# LESSON PLAN

Week	Date		Topics Planned Topics Finished
	From	To	
IX	27/11/2023	02/12/2023	Early image processing operation, optical flow & segmentation of images, object recognition by appearance pattern elements, Pedestrian detection with HoG features Reconstructing 3D world: Motion Parallax, Binocular stereo-opsis
X	04/12/2023	09/12/2023	Reconstructing 3D world: Multiple view texture, Shading & Contour, Object Recognition from structural information, user vision, Model paper
XI	11/12/2023	16/12/2023	<u>MODULE-5</u> Introduction, origin & challenge of NLP & grammatical processing of Indian languages, NLP applications Information retrieval.
XII	18/12/2023	23/12/2023	Language modelling, various grammatical based language models, statistical language models
XIII	25/12/2023	30/12/2023	Model paper discussion Revision
XIV	01/01/2024	06/01/2024	Revision
XV			
XVI			

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Teacher's Signature

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HOD'S Signature

## Model Question Paper-1 with effect from 2019-20 (CBCS Scheme)

USN

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### Seventh Semester B.E. Degree Examination Advanced Artificial Intelligence

TIME: 03 Hours

Max. Marks: 100

Note: 01. Answer any FIVE full questions, choosing at least ONE question from each MODULE.

Module – 1			
<b>Q.1</b>	(a)	What is PEAS? Explain different agent types with their PEAS descriptions.	<b>10M</b>
	(b)	Explain in detail the properties of Task Environments.	<b>10M</b>
<b>OR</b>			
<b>Q.2</b>	(a)	What are the four basic types of agent program in any intelligent system? Explain how did you convert them into learning agents?	<b>10M</b>
	(b)	Explain with algorithm and example:  i. Minimax algorithm  ii. Alpha-Beta Pruning	<b>10M</b>
<b>Module – 2</b>			
<b>Q.3</b>	(a)	Three persons A, B and C have applied for a job in a private company. The chance of their selections is in the ratio 1: 2: 4. The probabilities that A, B and C can introduce changes to improve the profits of the company are 0.8, 0.5 and 0.3, respectively. If the change does not take place, find the probability that it is due to the appointment of C.	<b>10M</b>
	(b)	Consider the set of all possible five-card poker hands dealt fairly from a standard deck of fifty-two cards.  1. How many atomic events are there in the joint probability distribution (i.e., how many five-card hands are there)? 2. What is the probability of each atomic event? 3. What is the probability of being dealt a royal straight flush? Four of a kind	<b>10M</b>
<b>OR</b>			
<b>Q.4</b>	(a)	A bag contains 4 balls. Two balls are drawn at random without replacement and are found to be blue. What is the probability that all balls in the bag are blue?	<b>10M</b>
	(b)	Three urns are there containing white and black balls; first urn has 3 white and 2 black balls, second urn has 2 white and 3 black balls and third urn has 4 white and 1 black balls. Without any biasing one urn is chosen from that one ball is chosen randomly which was white. What is probability that it came from the third urn?	<b>10M</b>
<b>Module – 3</b>			
<b>Q.5</b>	(a)	We have a bag of three biased coins a, b, and c with probabilities of coming up heads of 20%, 60%, and 80%, respectively. One coin is drawn randomly from the bag (with equal likelihood of drawing each of the three coins), and then the coin is flipped three times to generate the outcomes X1, X2, and X3.  1. Draw the Bayesian network corresponding to this setup and define the necessary CPTs. 2. Calculate which coin was most likely to have been drawn from the bag if the	<b>10M</b>

		observed flips come out heads twice and tails once	
	(b)	Write the variable elimination algorithm and rejection-sampling algorithm for inference in Bayesian networks	10M
<b>OR</b>			
Q.6	(a)	Write the likelihood-weighting algorithm for inference in Bayesian networks and explain the working of the algorithm.	10M
	(b)	<p>A patient has a disease N. Physicians measure the value of a parameter P to see the disease development. The parameter can take one of the following values {low, medium, high}. The value of P is a result of patient's unobservable condition/state S. S can be {good, poor}. The state changes between two consecutive days in one fifth of cases. If the patient is in good condition, the value for P is rather low (having 10 sample measurements, 5 of them are low, 3 medium and 2 high), while if the patient is in poor condition, the value is rather high (having 10 measurements, 3 are low, 3 medium and 4 high). On arrival to the hospital on day 0, the patient's condition was unknown, i.e., <math>P r(S_0 = \text{good}) = 0.5</math>.</p> <ol style="list-style-type: none"> <li>1. Draw the transition and sensor model of the dynamic Bayesian network modeling the domain under consideration,</li> <li>2. calculate probability that the patient is in good condition on day 2 given low P values on days 1 and 2,</li> <li>3. can you determine the most likely patient state sequence in days 0, 1 and 2 without any additional computations?, justify.</li> </ol>	10 M
<b>Module – 4</b>			
Q.7	(a)	Explain the concept of Pinhole camera for the formation of images with a neat diagram.	10M
	(b)	List and explain early image processing operations.	10M
<b>OR</b>			
Q.8	(a)	<p>Write short notes for the following using vision:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Words and Pictures</li> <li><input type="checkbox"/> Reconstruction from many views</li> <li><input type="checkbox"/> Controlling movement.</li> </ul>	10M
	(b)	Explain the concept of reconstructing the 3D world with neat diagram.	10M
<b>Module – 5</b>			
Q.9	(a)	List and explain different phases of analysis in Natural Language Processing with an example for each.	10M
	(b)	Write the algorithm for Minimum edit distance and compute the minimum edit distance between tutor and tumour.	10M
<b>OR</b>			
Q.10	(a)	<p>Consider the following Corpus of three sentences</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> There is a big garden.</li> <li><input type="checkbox"/> Children play in a garden</li> <li><input type="checkbox"/> They play inside beautiful garden</li> </ul> <p>Calculate P for the sentence "They play in a big Garden" assuming a bi-gram language model.</p>	10M
	(b)	<p>Write Regular Expression for the following:</p> <ol style="list-style-type: none"> <li>1. To accept strings book or books</li> <li>2. To accept color and color.</li> <li>3. To accept any +ve integer with an optional decimal point</li> <li>4. To check a string is an email address or not.</li> <li>5. To accept all variations of MHz,Mhz,mHz,mbz,MegaHertz,Megahertz,megaHertz,megahertz</li> </ol>	10M



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**Bangalore-560062**

**Department Of Artificial Intelligence & Machine Learning**

**Assignment 1**

**Subject: Advanced Artificial Intelligence**

**Sub Code: 18AI71**

**Sem:VII**

**Module 1**

- 1) What is PEAS? Explain different agents with their PEAS description
- 2) Explain in detail the properties of task environment.
- 3) What are the four basic types of agent program in any intelligent system? Explain how did you convert them into learning agents?
- 4) Explain with algorithm and example minimax algorithm
- 5) Explain with algorithm and example alpha beta pruning algorithm
- 6) Explain the structure of agents with diagrams
- 7) Explain the concept of move ordering in alpha beta pruning
- 8) Explain stochastic games with example
- 9) Explain partially observable games with example

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**Department Of Artificial Intelligence & Machine Learning**

**Subject Name: Advanced Artificial Intelligence**

**Sem & Branch: VII AIML**

**Subject Code: 18AI71**

**Assignment 2**

- 1) Write variable elimination algorithm for inference in Bayesian network
- 2) Write the rejection sampling algorithm for inference in Bayesian network
- 3) Write the likelihood-weighting algorithm for inference in Bayesian networks and explain working of algorithm
- 4) Explain the image formation using lens systems
- 5) Explain the concept of pinhole camera for the formation of images with a neat diagram
- 6) List and explain the early image processing operations
- 7) Explain representation of knowledge in an uncertain domain
- 8) Explain semantics of Bayesian network using full joint distribution
- 9) Explain semantics of Bayesian network using conditional independence relations
- 10) Explain inference by enumeration in exact inference
- 11) Explain direct sampling methods
- 12) Explain the concept of Markov chain simulation
- 13) Explain the concept of light and shading
- 14) Explain object recognition by appearance
- 15) Problem in notes

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Department Of Artificial Intelligence & Machine Learning

Subject Name: Advance Artificial Intelligence(AAI)

Sem & Branch: VII AIML

Subject Code: 18AI71

Question Bank

Module 1

- 1) What is PEAS? Explain different agents with their PEAS description
- 2) Explain in detail the properties of task environment.
- 3) What are the four basic types of agent program in any intelligent system? Explain how did you convert them into learning agents?
- 4) Explain with algorithm and example minimax algorithm
- 5) Explain with algorithm and example alpha beta pruning algorithm
- 6) Explain the structure of agents with diagrams
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- 9) Explain partially observable games with example



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**Department Of Artificial Intelligence & Machine Learning**

**Assignment 3**

**Subject: Advanced Artificial Intelligence**

**Sub Code: 18AI71**

**Sem:VII**

**Module 4 & 5**

- 1) Write short notes for following using vision:
  - a) Words and Pictures
  - b) Reconstruction from many views
  - c) Controlling movement
- 2) Explain the concept of reconstructing 3D world with neat diagram
- 3) Write an algorithm for minimum edit distance and compute minimum edit distance between tutor and tumor
- 4) List and explain different phases of analyses in Natural Language Processing with an example for each
- 5) What is Natural Language Processing? List and explain applications of NLP
- 6) Consider the following corpus of three sentences:

There is a big garden  
Children play in a garden  
They play inside beautiful garden

Calculate  $P$  for sentences. "They play in a big garden" assuming a bi-gram language model
- 7) List and explain challenges of NLP
- 8) Explain n-gram model and derive its expressions
- 9) Describe Paninian framework for Indian languages. Explain layered representation of Paninian grammar and Karaka Theory
- 10) Explain some of the early NLP systems
- 11) Explain the transformational grammar with example



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**Department Of Artificial Intelligence & Machine Learning**

**Subject Name: Advance Artificial Intelligence(AAI)**

**Sem & Branch: VII AIML**

**Subject Code: 18AI71**

**Question Bank**

**Module 1**

- 1) Three persons A, B and C have applied for a job in a private company. The chance of their selections is in the ratio 1: 2: 4. The probabilities that A, B and C can introduce changes to improve the profits of the company are 0.8, 0.5 and 0.3, respectively. If the change does not take place, find the probability that it is due to the appointment of C.
- 2) Consider the set of all possible five-card poker hands dealt fairly from a standard deck of fifty-two cards.
  1. How many atomic events are there in the joint probability distribution (i.e.how many five-card hands are there)?
  2. What is the probability of each atomic event?
  3. What is the probability of being dealt a royal straight flush? Four of a kind
- 3) A bag contains 4 balls. Two balls are drawn at random without replacement and are found to be blue. What is the probability that all balls in the bag are blue?
- 4) Three urns are there containing white and black balls; first urn has 3 white and 2 black balls, second urn has 2 white and 3 black balls and third urn has 4 white and 1 black balls. Without any biasing one urn is chosen from that one ball is chosen randomly which was white. What is probability that it came from the third urn?
- 5) Given full joint distribution shown below. Calculate the following

	Toothache		~ Toothache	
	catch	~ catch	catch	~ catch
cavity	0.108	0.012	0.072	0.008
~ cavity	0.016	0.064	0.144	0.576



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- a)  $P(\text{toothache})$
  - b)  $P(\text{cavity})$
  - c)  $P(\text{toothache}|\text{cavity})$
  - d)  $P(\text{cavity}|\text{toothache} \vee \text{cavity})$
- 
- 6) Explain the concept of inference using full joint distribution
  - 7) Explain the concept of using Bayes rule in combining evidence
  - 8) Explain the concept of Wumpus World

Table showing the Bloom's Taxonomy Level, Course Outcome and Programme Outcome				
Question		Bloom's Taxonomy Level attached	Course Outcome	Programme Outcome
Q.1	(a)	L1	CO1	PO1
	(b)	L1	CO2	PO1
Q.2	(a)	L2	CO2	PO2
	(b)	L3	CO2	PO2
Q.3	(a)	L3	CO3	PO3
	(b)	L4	CO2	PO3
Q.4	(a)	L2	CO1	PO3
	(b)	L2	CO2	PO3
Q.5	(a)	L2	CO2	PO3
	(b)	L2	CO2	PO4
Q.6	(a)	L1	CO3	PO5
	(b)	L2	CO2	PO6
Q.7	(a)	L4	CO2	PO9
	(b)	L2	CO3	PO12
Q.8	(a)	L3	CO2	PO6
	(b)	L4	CO2	PO9
Q.9	(a)	L3	CO2	PO9
	(b)	L3	CO3	PO4
Q.10	(a)	L3	CO3	PO5
	(b)	L3	CO3	PO12
Bloom's Taxonomy Levels	<b>Lower order thinking skills</b>			
	Remembering( knowledge): <i>L</i> <sub>1</sub>	Understanding Comprehension): <i>L</i> <sub>2</sub>	Applying (Application): <i>L</i> <sub>3</sub>	
	<b>Higher order thinking skills</b>			
	Analyzing (Analysis): <i>L</i> <sub>4</sub>	Valuating (Evaluation): <i>L</i> <sub>5</sub>	Creating (Synthesis): <i>L</i> <sub>6</sub>	



## CITY ENGINEERING COLLEGE

Kanakapura Road, Doddakallasandra, Bengaluru - 560062

Vagdekar

## FIRST INTERNAL TEST

Programme: AI &amp; ML

Date: 15/11/2023

Course Name: Advanced Artificial Intelligence

Time: 10:30PM – 12:00 PM

Sem:7

Duration:1 ½ Hrs

MAX MARKS: 50

Note:1) Answer any FIVE questions choosing at least ONE from each Part.

2)Diagrams carry marks. Draw neat labeled diagrams wherever required.

Q no		Mark s	CO	BTL
Part –A				
1.	What is PEAS? Explain different agents with their PEAS description	10	CO1	BT1
Or				
2.	Explain the structure of agents with diagrams	10	CO1	BT1
Part – B				
3a)	Explain with algorithm and example the minimax algorithm	5	CO1	BT1
3b)	Explain with algorithm and example alpha beta pruning algorithm	5	CO1	BT1
Or				
4.	Explain in detail the properties of task environments	10	CO1	BT1
Part-C				
5a)	a) Consider the set of all possible five-card poker hands dealt fairly from a standard deck of fifty-two cards. 1. How many atomic events are there in the joint probability distribution (i.e., how many five-card hands are there)? 2. What is the probability of each atomic event? 3. What is the probability of being dealt a royal straight flush? Four of a kind	5	CO2	BT1
5b)	Three urns are there containing white and black balls; first urn has 3 white and 2 black balls, second urn has 2 white and 3 black balls and third urn has 4 white and 1 black balls. Without any biasing one urn is chosen from that one ball is chosen randomly which was white. What is probability that it came from the third urn?	5	CO2	BT1
Or				
6.	Explain partially observable games with example	10	CO1	BT1
Part-D				
7a)	Three persons A, B and C have applied for a job in a private company. The chance of their selections is in the ratio 1: 2: 4. The probabilities that A, B and C can introduce changes to improve the profits of the company are 0.8, 0.5 and 0.3, respectively. If the change does not take place, find the probability that it is due to the appointment of C.	6	CO2	BT2
7b)	A bag contains 4 balls. Two balls are drawn at random without replacement and are found to be blue. What is the probability that all balls in the bag are blue?	4	CO2	BT1

Or

8a)	Explain the move ordering concept in alpha beta pruning	5	CO1	BT2
8b)	Explain stochastic games with example	5	CO1	BT1

Part-E

9.	Given the full joint distribution shown below, calculate the following				10	CO2	BT2	
		toothache		~toothache				
		Catch	~catch	Catch				~catch
	cavity	0.108	0.012	0.072				0.008
	~cavity	0.016	0.064	0.144				0.576
a) $P(\text{toothache})$ b) $P(\text{cavity})$ c) $P(\text{toothache}   \text{cavity})$ d) $P(\text{cavity}   \text{toothache} \vee \text{catch})$								

Or

10	Explain the concept of wumpus world	10	CO2	BT2
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**Blooms Taxonomy Levels (BTL):**

**BT2-** Understanding    **BT3 –** Applying    **BT4 –** Analyzing    **BT5-** Evaluating

**Course Outcomes (Cos):**

**CO1:** Demonstrate the fundamentals of intelligent agents

**CO2:** Illustrate the reasoning on uncertain knowledge

**CO3:** Explore the explanation-based learning in solving AI problems

**CO4:** Demonstrate the applications of rough sets and Evolutionary Computing algorithms

*Vagdevi S*



# CITY ENGINEERING COLLEGE

DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND

MACHINE LEARNING ENGINEERING

## SCHEME FOR EVALUATION

SUB CODE: 18A171

CIE TEST I

SUB: Advanced Artificial Intelligence

SEMESTER & SECTION: VII

DATE: 10/11/2023

Q. No	Details of the Answer	Marks Distribution	Total marks																														
①	<p>PEAS definition. Example of Automated Taxi</p> <p>Table for different agents for PEAS (filled)</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="width: 15%;">Agent Type</th> <th style="width: 25%;">Performance Measure</th> <th style="width: 20%;">Environment</th> <th style="width: 15%;">Actuator</th> <th style="width: 25%;">Sensor</th> </tr> </thead> <tbody> <tr> <td>Medical Diagnosis</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Satellite Image</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Pre-picking Robot</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Refinery controller</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Intelligence English Tutor</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Agent Type	Performance Measure	Environment	Actuator	Sensor	Medical Diagnosis					Satellite Image					Pre-picking Robot					Refinery controller					Intelligence English Tutor					<p><math>\frac{1}{2} + 2</math></p> <p style="text-align: center; border: 1px solid black; border-radius: 50%; padding: 5px;">2½</p> <p><math>1\frac{1}{2}</math> Each.</p> <p style="text-align: center; border: 1px solid black; border-radius: 50%; padding: 5px;">7½</p>	10
Agent Type	Performance Measure	Environment	Actuator	Sensor																													
Medical Diagnosis																																	
Satellite Image																																	
Pre-picking Robot																																	
Refinery controller																																	
Intelligence English Tutor																																	
②	<p>Structure of Agents. Name &amp; Explain 5 Types of with diagram.</p> <ul style="list-style-type: none"> <li>→ Simple Reflex agents</li> <li>→ Model Based Reflex Agents</li> <li>→ Goal-based agents</li> <li>→ Utility based Agents</li> <li>→ Learning Based Agents</li> </ul>	<p>2 Marks</p> <p>2 Marks</p> <p>2 Marks</p> <p>2 Marks</p> <p>2 Marks</p>	10																														

Staff Signature: *[Signature]*

HOD  
*[Signature]*  
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Bangalore-560064

Q. No	Details of the Answer	Marks Distribution	Total marks
3a)	Minimax algorithm. Algorithm explanation Example with all steps shown	2 1/2 Marks 2 1/2 Marks	(5)
3b)	Alpha beta pruning algorithm. Algorithm explanation Example with all steps shown	2 1/2 Marks 2 1/2 Marks	(5)
4)	<p><u>Task Environments</u>: Explain following with Example</p> <ul style="list-style-type: none"> <li>1) Fully observable v/s Partially observable</li> <li>2) Single Agent v/s Multiagent</li> <li>3) Deterministic v/s Stochastic</li> <li>4) Episodic v/s Sequential</li> <li>5) Static v/s Dynamic</li> <li>6) Discrete v/s continuous</li> <li>7) Known v/s unknown.</li> </ul>	1 1/2 1 1/2 1 1/2 1 1/2 1 1/2 1 1/2 1	10 Marks
5a)	<p>a) <math>\binom{52}{5} = \frac{52!}{5!(52-5)!} = \frac{52!}{5! \cdot 47!} = 2598960</math></p> <p>b) <math>P(\text{Atomic Event}) = \frac{1}{\text{No of Atomic Event}} = \frac{1}{2598960} = 0.00000038</math></p> <p>c) <math>\frac{1}{2598960} = 0.00000154</math> 49 a kind = <math>\frac{624}{2598960}</math></p>	1 Mark. 1 Mark 1 1/2 1 1/2	(5M)

*Ques*

Q. No	Details of the Answer	Marks Distribution	Total marks
(5b)	<p> <math>U_1 = \{3 \text{ white, } 2 \text{ black balls}\}</math>  <math>U_2 = \{2 \text{ white, } 3 \text{ black balls}\}</math>  <math>U_3 = \{4 \text{ white, } 1 \text{ black ball}\}</math> </p> <p> <math>E_1 = \{ \text{ball chosen from } U_1 \}</math>  <math>E_2 = \{ \text{ball chosen from } U_2 \}</math>  <math>E_3 = \{ \text{ball chosen from } U_3 \}</math> </p> <p> <math>E = \{ \text{Event that white ball is drawn} \}</math> </p> <p> <math>P(E E_1) = 3/5</math>    <math>P(E E_2) = 2/5</math>    <math>P(E E_3) = 4/5</math> </p> <p> <math>P(E_3 E) = \frac{P(E_3) \cdot P(E E_3)}{P(E_1)P(E E_1) + P(E_2)P(E E_2) + P(E_3)P(E E_3)}</math> </p> <p> <math>\frac{1/3 \times 4/5}{1/3 \times 3/5 + 1/3 \times 2/5 + 1/3 \times 4/5} = \left( \frac{4}{9} \right)</math> </p>	<p>1 Mark</p> <p>1 Mark</p> <p>1 Mark</p> <p>2 Marks</p>	<p>5 Marks</p>
6a)	<p>Partially observable games.</p> <p>Explain with chess example.</p> <p>Write about state estimation, probabilistic checkmate, guaranteed checkmate, accidental checkmate</p> <p>Card game :- Explain</p> <p> <math>\arg \max_a \sum_s P(s) \text{MINIMAX}(\text{RESULT}(s, a))</math>  <math>\arg \max_a \frac{1}{N} \sum_{i=1}^N \text{MINIMAX}(\text{RESULT}(s_i, a))</math> </p> <p>Explain with example</p>	<p>2 1/2</p> <p>2 1/2</p> <p>5 Marks</p>	<p>10</p>

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Q. No	Details of the Answer	Marks Distribution	Total marks
7a)	<p> <math>P(E_1) = 1/7</math> , <math>P(E_2) = 2/7</math>    <math>P(E_3) = 4/7</math>    <math>\rightarrow 2 \frac{1}{2}</math>  <math>P(A E_1) = 0.2</math>    <math>\rightarrow 1 \frac{1}{2}</math>  <math>P(B E_2) = 0.5</math>    Req  <math>P(C E_3) = 0.7</math>            Required probability = <math>P(E_3 C)</math>  <math display="block">P(E_3 C) = \frac{P(E_3) P(C E_3)}{P(E_1)P(A E_1) + P(E_2)P(A E_2) + P(E_3)P(A E_3)}</math> <math display="block">= \frac{4/7 \times 0.7}{1/7 \times 0.2 + 2/7 \times 0.5 + 4/7 \times 0.7} = 0.7 \rightarrow 2 \text{ Marks}</math> </p>	<p> <math>\rightarrow 2 \frac{1}{2}</math>  <math>\rightarrow 1 \frac{1}{2}</math>  <math>\rightarrow 1</math>  <math>\rightarrow 2 \text{ Marks}</math> </p>	6 Marks
7b)	<p>           Bag contains 4 balls, 1st find probability of drawing 2 balls that blue from the bag.            Probability of 1st blue ball = <math>2/4</math>            Probability of 2nd blue ball = <math>1/3</math>            Probability that all balls in bag are blue = <math>2/4 \times 1/3 = 2/12 = 1/6</math>.         </p>	<p> <math>\rightarrow 1 \text{ Mark}</math>  <math>1 \text{ Mark}</math>  <math>2 \text{ Marks}</math> </p>	4 Marks
8)a)	<p>           Disadvantage of limit in alphabetical priority            worst ordering &amp; ideal ordering            4 rules for good ordering         </p>	<p> <math>1 \text{ Mark}</math>  <math>2 \text{ Marks}</math>  <math>2 \text{ Marks}</math> </p>	5 Marks

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Q. No	Details of the Answer	Marks Distribution	Total marks
8b)	Stochastic Games Introduction Example: - Backgammon game. Explain. EXPECTIMINIMAX(S) = formula. & Explain	1 Mark 2 Marks 2 Marks	3
9a)	a) $P(\text{toothache}) = 0.108 + 0.012 + 0.016 + 0.064$ $P(\text{toothache}) = 0.2$ b) $P(\text{cavity}) = (0.108 + 0.012 + 0.072 + 0.008)$ $P(\text{cavity}) = 0.2$ c) $P(\text{Toothache}   \text{cavity}) = \frac{P(\text{toothache and cavity})}{P(\text{cavity})}$ $P(\text{Toothache}   \text{cavity}) = \frac{0.108 + 0.012}{0.2}$ $P(\text{Toothache}   \text{cavity}) = 0.6$ d) $P(\text{cavity}   \text{toothache} \vee \text{catch}) = \frac{P(\text{toothache and cavity})}{P(\text{toothache and catch})}$ $P(\text{cavity}   \text{toothache} \vee \text{catch}) = \frac{0.108}{0.108 + 0.016}$ $= 0.87097$	2 Mark 1 Mark 2 Marks 2 Marks 3 Marks	10 Marks
10b)	Wumpus world. Diagram: - Evidence & direction of square formulae & deduction Explanation Diagram of frontier variables.	2 Marks. 6 Marks 2 Marks 2 Marks	10 Marks

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## CITY ENGINEERING COLLEGE

Kanakapura Road, Doddakallasandra, Bengaluru - 560062

## SECOND INTERNAL TEST

Vaglus

Programme: AI &amp; ML

Course Name: Advanced Artificial Intelligence

Sem:7

Duration:1 ½ Hrs

Date: 15/12/2023

Time: 10:30PM – 12:00 PM

MAX MARKS: 50

Note:1) Answer any FIVE questions choosing at least ONE from each Part.

2)Diagrams carry marks. Draw neat labeled diagrams wherever required.

Q no		Mark s	CO	BTL
<b>Part –A</b>				
1.	Write the likelihood-weighting algorithm for inference in Bayesian networks and explain working of algorithm	10	CO1	BT1
<b>Or</b>				
2.	Three persons A, B and C have applied for a job in a private company. The chance of their selections is in the ratio 1: 2: 4. The probabilities that A, B and C can introduce changes to improve the profits of the company are 0.8, 0.5 and 0.3, respectively. If the change does not take place, find the probability that it is due to the appointment of C.	10	CO1	BT1
<b>Part – B</b>				
3	Explain the image formation using lens systems	10	CO1	BT1
<b>Or</b>				
4.	List and explain the early image processing operations	10	CO1	BT1
<b>Part-C</b>				
5a)	Write variable elimination algorithm for inference in Bayesian network	5	CO2	BT1
5b)	Write the rejection sampling algorithm for inference in Bayesian network	5	CO2	BT1
<b>Or</b>				
6.	Explain the concept of pinhole camera for the formation of images with a neat diagram	10	CO1	BT1
<b>Part-D</b>				
7	Explain representation of knowledge in an uncertain domain?	10	CO2	BT1
<b>Or</b>				
8a)	Explain semantics of Bayesian network using full joint distribution	5	CO1	BT2
8b)	Explain semantics of Bayesian network using conditional independence relations	5	CO1	BT1

Vaglus

**CITY ENGINEERING COLLEGE**  
 DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE  
 LEARNING ENGINEERING

**SCHEME FOR EVALUATION**

**CIE TEST II**

SEMESTER & SECTION: VII 'A'  
 SUBJECT: Advanced Artificial Intelligence

SUB CODE: 18A171  
 DATE: 15/12/2023

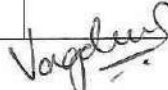
Q. No	Details of the Answer	Marks Distribution	Total marks																																	
	<p style="text-align: center;">Part A</p> <p>likelihood weighting avoids inefficiency of rejection sampling by generating only events that are consistent with evidence.                      Explain likelihood-weighting                      write Example :-</p> <div style="display: flex; justify-content: space-around;"> <table border="1" style="border-collapse: collapse;"> <tr><td>C</td><td>P(S)</td></tr> <tr><td>t</td><td>.10</td></tr> <tr><td>f</td><td>.50</td></tr> </table> <div style="text-align: center;"> <p>cloudy</p> <p>↓</p> <p>Sprinkler</p> </div> <div style="text-align: center;"> <p>Rain</p> <p>↓</p> <p>Wet Grass</p> </div> <table border="1" style="border-collapse: collapse;"> <tr><td>C</td><td>P(C)</td></tr> <tr><td>t</td><td>.5</td></tr> <tr><td>f</td><td>.5</td></tr> </table> </div> <div style="margin-top: 20px;"> <table border="1" style="border-collapse: collapse;"> <tr><td>C</td><td>P(R)</td></tr> <tr><td>t</td><td>.80</td></tr> <tr><td>f</td><td>.20</td></tr> </table> </div> <div style="margin-top: 20px;"> <table border="1" style="border-collapse: collapse;"> <tr><td>S</td><td>R</td><td>P(W)</td></tr> <tr><td>t</td><td>t</td><td>.99</td></tr> <tr><td>t</td><td>f</td><td>.90</td></tr> <tr><td>f</td><td>t</td><td>.90</td></tr> <tr><td>f</td><td>f</td><td>.00</td></tr> </table> </div> <p>Query <math>P(\text{Rain} / \text{cloudy} = \text{true}, \text{WetGrass} = \text{true})</math>                      &amp; ordering Cloudy, Sprinkler, Rain, Wet-Grass.                      Set <math>w = 1.0</math>.</p>	C	P(S)	t	.10	f	.50	C	P(C)	t	.5	f	.5	C	P(R)	t	.80	f	.20	S	R	P(W)	t	t	.99	t	f	.90	f	t	.90	f	f	.00	5	
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Q. No	Details of the Answer	Marks Distribution	Total marks
	<p>① Cloudy <math>w \leftarrow w \times P(\text{Cloudy} = \text{true}) = 0.5</math>.</p> <p>② Sprinkler not Evidence variable, so sample from <math>P(\text{Sprinkler}   \text{Cloudy} = \text{true}) = \langle 0.1, 0.9 \rangle</math>; Suppose this returns false</p> <p>③ Sample from <math>P(\text{Rain}   \text{Cloudy} = \text{true}) = \langle 0.8, 0.2 \rangle</math> Suppose returns true.</p> <p>④ WetGrass is Evidence variable with value True. <math>\therefore w \leftarrow w \times P(\text{WetGrass} = \text{true}   \text{Sprinkler} = \text{false}, \text{Rain} = \text{true}) = 0.45</math>.</p> <p><math>\langle \text{true}, \text{false}, \text{true}, \text{true} \rangle</math> with weight 0.45 and tallied under <math>\text{Rain} = \text{true}</math>.</p> <p>Writing algorithm. specify equation  <math display="block">SWS(z, e) = \prod_{i=1}^l P(z_i   \text{parents}(z_i))</math> and all equations till likelihood return consistent estimates.  <div style="border: 1px solid black; padding: 5px; display: inline-block;"> <math>= \kappa^l P(z, e) = P(z   e)</math> </div> </p>	5	10M

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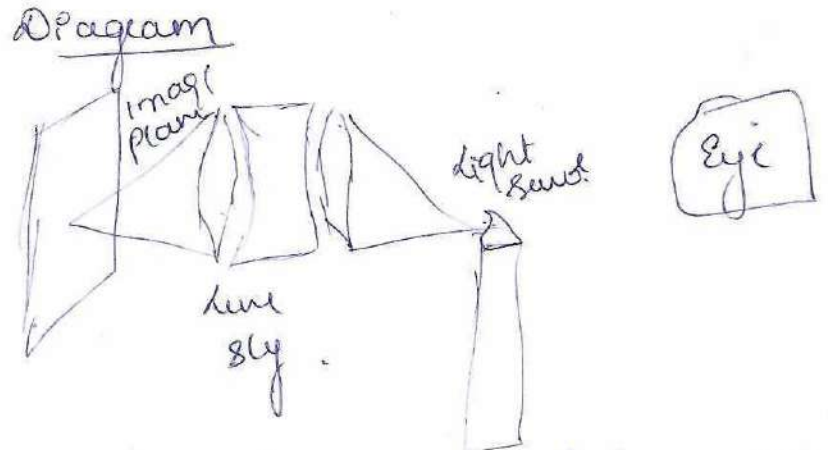
  
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Q. No	Details of the Answer	Marks Distribution	Total marks
②	<p>a) Let <math>E_1, E_2</math> &amp; <math>E_3</math> be Events denoting selection of A, B &amp; C  <math>(1+2+4=7)</math>  <math>P(E_1) = \frac{1}{7}</math> = prob of selection of A as a manager.</p> <p><math>P(E_2) = \frac{2}{7}</math> = prob of selection of B as a manager</p> <p><math>P(E_3) = \frac{4}{7}</math> = prob of selection of C as a manager.</p> <p>Let A be the Events denoting the changes not taking place.</p> <p><math>P(A E_1) = 1 - 0.8 = 0.2</math>  <math>P(A E_2) = 1 - 0.5 = 0.5</math>  <math>P(A E_3) = 1 - 0.3 = 0.7</math>.</p> <p>Required Prob is <math>P(E_3 A)</math>  By using Baye's Theorem.</p> $P(E_3 A) = \frac{P(E_3)P(A E_3)}{P(E_1)P(A E_1) + P(E_2)P(A E_2) + P(E_3)P(A E_3)}$ $P(E_3 A) = \frac{\frac{4}{7} \times 0.7}{\frac{1}{7} \times 0.2 + \frac{2}{7} \times 0.5 + \frac{4}{7} \times 0.7} = \frac{2.8}{0.2 + 1 + 2.8}$ <p style="text-align: center;"><u><math>P(E_3 A) = 0.7</math></u></p>	<p>①</p> <p>②</p> <p>⑤</p> <p>②</p> <p>④</p> <p>①</p>	<p>10</p>

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Q. No	Details of the Answer	Marks Distribution	Total marks
<p>⑤ we need to determine <sup>Part B</sup></p> <p>③ Image formation : Explanation of how formation takes place.</p> <p>Diagram</p>  <p>write draw back of pinhole camera. → ② Depth of field, focal plane definition → ②</p>	<p>④</p> <p>②</p>	<p>④</p> <p>②</p>	<p>10</p>
<p>④</p> <p><u>Early image processing operations</u> Explain following</p> <p>① Edge Detection (write Equations)</p> <p>② Texture</p> <p>③ Optical flow</p> <p>④ Segmentation of Images</p>		<p>④</p> <p>②</p> <p>②</p> <p>②</p>	<p>10</p>

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Q. No	Details of the Answer	Marks Distribution	Total marks
5a)	<p style="text-align: center;"><u>Part c</u></p> <p><u>Variable Elimination Algorithm</u></p> <p>How to improve Enumeration algorithm            Idea behind variable elimination alg            write the Equations &amp; illustrate process            for Burglary network Example:-</p> $P(B j, m) = \underbrace{\alpha P(B)}_{f_1(B)} \underbrace{\sum_e P(e)}_{f_2(E)} \underbrace{\sum_a P(a B, e)}_{f_3(A, B, E)} \underbrace{P(j a)}_{f_4(A)} \underbrace{P(m a)}_{f_5(A)}$ $f_4(A) = \begin{pmatrix} P(j a) \\ P(j va) \end{pmatrix} = \begin{pmatrix} 0.90 \\ 0.85 \end{pmatrix}$ $f_5(A) = \begin{pmatrix} P(m a) \\ P(m va) \end{pmatrix} = \begin{pmatrix} 0.70 \\ 0.01 \end{pmatrix}$ <p>Explain how Query expression is written in terms of factors</p> $P(B j, m) = \underbrace{\alpha}_{f_1(B)} \times \underbrace{\sum_e}_{f_2(E)} \underbrace{\sum_a}_{f_3(A, B, E)} \underbrace{P(j a)}_{f_4(A)} \times \underbrace{P(m a)}_{f_5(A)}$	②	

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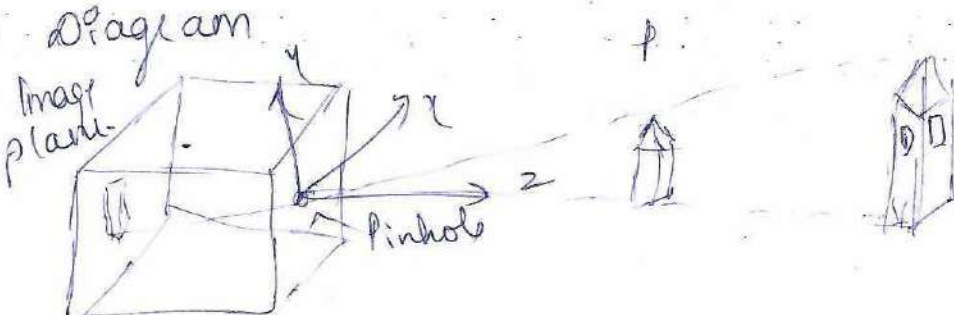
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Q. No	Details of the Answer	Marks Distribution	Total marks
	<p>Alg: should be written</p>	<p>①</p> <p>②</p>	5 Marks
5b)	<p><u>Rejection Sampling Alg</u></p> <p>Explain Rejection Sampling algorithm should be written.</p> <p>From definition write equation &amp; explain</p> $P(x e) = \frac{N_{ps}(x, e)}{N_{ps}(e)}$ $P(x e) = \frac{P(x, e)}{P(e)} = P(x e)$	<p>①</p> <p>②</p> <p>②</p>	5 Marks

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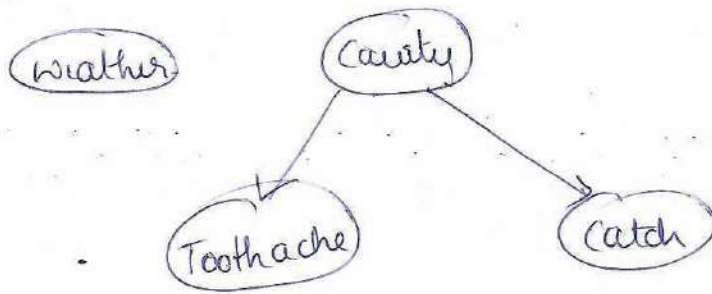
Q. No	Details of the Answer	Marks Distribution	Total marks
6	<p><u>Pinhole camera</u></p> <p>Diagram</p>  <p>Explain how image is formed.</p> <p>Write Equations</p> $\frac{-x}{f} = \frac{x}{z}, \quad \frac{-y}{f} = \frac{y}{z} \Rightarrow x = \frac{-fX}{z}$ $y = \frac{-fY}{z}$ $\left( f \frac{x_0 + d_1 y}{z_0 + d_1 w}, \quad f \frac{y_0 + d_1 v}{z_0 + d_1 w} \right)$ <p>As <math>d_1 \rightarrow \infty</math>, or <math>d_1 \rightarrow -\infty</math> becomes</p> $p_{\infty} = (f u / w, f v / w) \text{ if } w \neq 0.$ <p><u>Part D.</u></p> <p>Representation of knowledge in an uncertain domain</p> <p>Bayesian network definition &amp; its specification</p>	<p>3</p> <p>3</p> <p>2</p> <p>2</p> <p>1</p>	<p>10 marks</p>
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Q. No

Details of the Answer

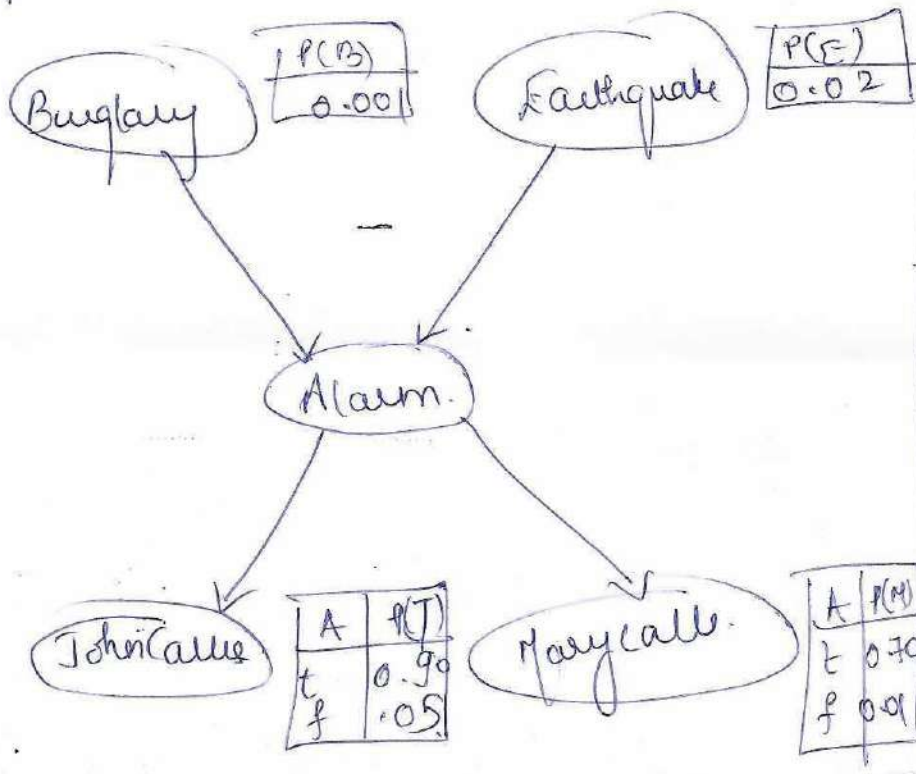
Marks Distribution

Total marks



3

Explain the variables & also explain Burglar Alarm. Example.



10 Marks

A

Explain how to build conditional probability table (CPT)

2

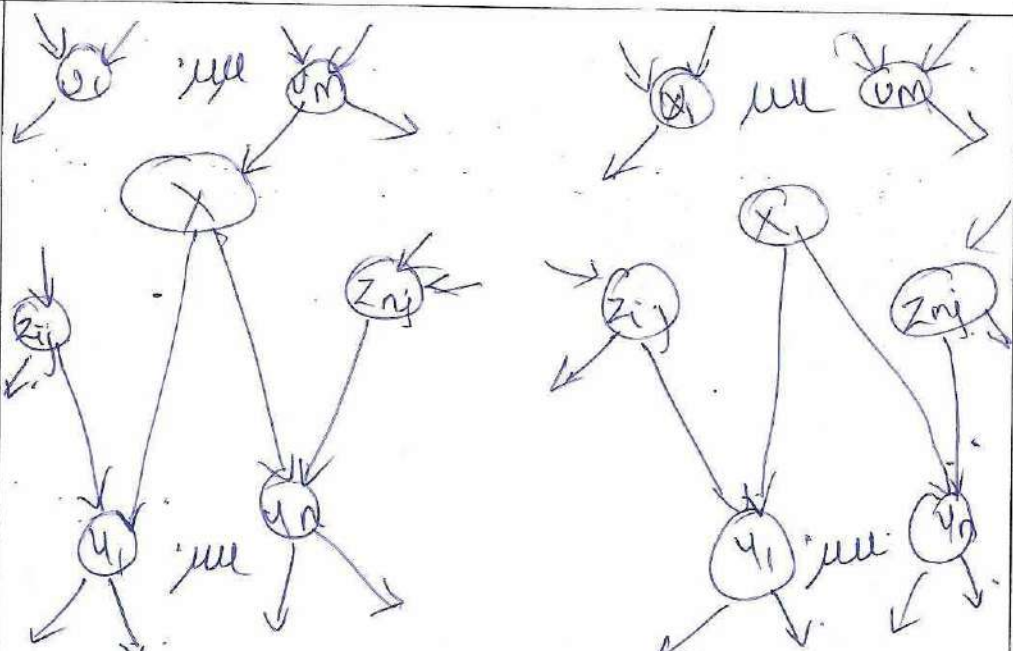
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Q. No	Details of the Answer	Marks Distribution	Total marks
8a	<p>Semantics of Bayesian Network using full joint distribution.</p> <p>Brief introduction.</p> <p>Derivation.</p> $P(x_1, \dots, x_n) = \prod_{i=1}^n \theta(x_i   \text{parents}(x_i))$ <p>Explanation</p> $P(x_1, \dots, x_n) = \prod_{i=1}^n P(x_i   \text{parents}(x_i))$ <p>Calculating joint distribution</p> $P(j, m, a, \sim b, \sim c) = P(j a) P(m a) P(a \sim b, \sim c) P(\sim b) P(\sim c)$ $= 0.90 \times 0.70 \times 0.001 \times 0.999 \times 0.998 = 0.000628$	<p>1</p> <p>2</p> <p>2</p>	54
8b)	<p>Semantics of Bayesian network using conditional independence relations</p> <p>Explain term descendants, markov blanket</p> <p>John &amp; Mary case example to be considered, explained &amp; shown in diagram</p>	<p>1</p> <p>1</p>	

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Q. No	Details of the Answer	Marks Distribution	Total marks
	 <p>       (a) Node <math>X</math> is conditionally independent of its non-descendants     </p> <p>       (b) Node <math>X</math> is conditionally independent of all other nodes <math>Z_{1j}, Z_{2j}</math> given its Markov Blanket     </p>	3	5M
9	<p><u>Markov Chain Simulation</u></p> <p>           How Markov Chain is different from Rejection Sampling &amp; likelihood weighting            How each sample is generated in MCMC.         </p> <p>           Gibbs Sampling Explain            write complete derivation.         </p>	<p>(2)</p> <p>(8)</p>	10 marks

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Q. No	Details of the Answer	Marks Distribution	Total marks
10)	<p>Inference by Enumeration in Exact Inference.</p> <p>Explain Exact Inference in Bayesian Networks.</p> <p>write Equations</p> $P(x e) = \alpha P(x, e) = \alpha \sum_y P(x, e, y)$ <p>consider Burglary alarm Example &amp;</p> $P(b j, m) = \alpha P(b, j, m) = \alpha \sum_e \sum_a P(b, j, m, e, a)$ $P(b j, m) = \alpha \sum_a \sum_e P(b) P(e) P(a b, e) P(j a) P(m a)$ <p>Derive :-</p> $P(b j, m) = \alpha P(b) \sum_e P(e) \sum_a P(a b, e) P(j a) P(m a)$ <p>calculate probabilities</p> $P(b j, m) = \alpha < 0.00059224, 0.0014919 >$ $< 0.284, 0.716 >$ <p>Explain.</p>	2	10 Marks

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Q. No	Details of the Answer	Marks Distribution	Total marks
①	Phases of analysis in NLP with an Ex for each. - Explain Lexical Analysis Syntactic Analysis Semantic Analysis Discourse Analysis Pragmatic Analysis	$2 \times 5 = 10$	10 Marks
②	NLP:- Definition / Explain what is NLP. List & Explain applications of NLP. <u>Applications:</u> Explain ① Machine Translation ② Speech Recognition ③ Speech Synthesis ④ Native Language Interfaces to DB ⑤ Information Retrieval ⑥ Information Extraction ⑦ Question Answering ⑧ Text Summarization	$2 \times 4 = 8$	10 Marks

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Q. No	Details of the Answer	Marks Distribution	Total marks
	<p>c) <u>Controlling Movement</u></p> <p>write principal uses of vision to provide information both for manipulating objects, picking them up, grasping them, trajectory them etc</p> <p>Ex: vision system for an automated vehicle driving on a freeway.</p> <p>write tasks faced by driver</p> <ol style="list-style-type: none"> <li>① lateral control</li> <li>② longitudinal control</li> <li>③ obstacle avoidance</li> </ol> <p>Explain each task</p> <p>② <u>Reconstructing 3D world</u></p> <p>Introduction:</p> <p>a) Explain Motion Parallax</p> <p>→ Equations of optical flow:</p> $v_x(x, y) = \frac{-T_x + x T_z}{z(x, y)} \quad v_y(x, y) = \frac{T_y + y T_z}{z(x, y)}$ <p><math>z(x, y)</math> is z-coordinate of pt in scene corresponding to pt in image at <math>(x, y)</math></p> <p><math>v_x(x, y)</math> &amp; <math>v_y(x, y)</math> are at zero at point <math>x = T_x/T_z, y = T_y/T_z</math> focus of expansion</p>	2 1/2	10.11

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HOD

Q. No	Details of the Answer	Marks Distribution	Total marks
	<p><math>(x', y')</math> be new coordinates defined by  <math>x' = x - T_x/T_z</math>, <math>y' = y - T_y/T_z</math>. Then</p> <p><math>v_x(x', y') = \frac{x' T_z}{z(x', y')}</math>     <math>v_y(x', y') = \frac{y' T_z}{z(x', y')}</math></p> <p>Extracting useful information - Explain &amp; points.</p> <p><u>Binocular Stereopsis</u></p> <p>Explain: <u>near disparity</u>, <u>measuring disparity</u>  write Equations</p> $\delta o/z = \frac{b/z}{z} \cdot \frac{-b/z}{z + \delta z} \approx \frac{b \delta z}{z^2}$ <p>actual disparity is <math>\delta o</math></p> $\text{disparity} = \frac{b \delta z}{z^2}$ <p>write about  Multiple views, Texture, Shading, Contour, Objects &amp; geometric structure of scenes</p>	<p>(3)</p> <p>(2)</p> <p>(5)</p>	<p>10 marks</p>

*(Signature)*  
Staff Signature:

*(Signature)*  
HOD

## CITY ENGINEERING COLLEGE

Kanakapura Road, Doddakallasandra, Bengaluru - 560062

## THIRD INTERNAL TEST

Vaglu S

Programme: AI &amp; ML

Course Name: Advanced Artificial Intelligence

Time: 10:30PM – 12:00 PM

Duration: 1 ½ Hrs

Date: 03/01/2024

Sem:7

MAX MARKS: 50

Note:1) Answer any FIVE questions choosing at least ONE from each Part.

2)Diagrams carry marks. Draw neat labeled diagrams wherever required.

Q no		Mark s	CO	BTL
<b>Part - A</b>				
1.	Write short notes for following using vision: a)Words and Pictures      b) Reconstruction from many views      c) Controlling movement	10	CO2	BT3
<b>Or</b>				
2.	Explain the concept of reconstructing 3D world with neat diagram	10	CO2	BT4
<b>Part - B</b>				
3	Write an algorithm for minimum edit distance and compute minimum edit distance between tutor and tumor	10	CO3	BT3
<b>Or</b>				
4.	List and explain different phases of analyses in Natural Language Processing with an example for each	10	CO2	BT3
<b>Part-C</b>				
5	What is Natural Language Processing? List and explain applications of NLP	10	CO2	BT3
<b>Or</b>				
6.	Consider the following corpus of three sentences: There is a big garden Children play in a garden They play inside beautiful garden Calculate P for sentences. "They play in a big garden" assuming a bi-gram language model	10	CO3	BT3
<b>Part-D</b>				
7	List and explain challenges of NLP	10	CO2	BT3
<b>Or</b>				
8	Explain n-gram model and derive its expressions	10	CO2	BT3
<b>Part-E</b>				
9.	Describe Paninian framework for Indian languages. Explain layered representation of Paninian grammar and Karaka Theory	10	CO2	BT3

Vaglu S

# CITY ENGINEERING COLLEGE

DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE  
LEARNING ENGINEERING

## SCHEME FOR EVALUATION

### CIE TEST III

SEMESTER & SECTION: VII A  
SUBJECT: Advanced Artificial Intelligence

SUB CODE: 18A171  
DATE: 03/01/24

Q. No	Details of the Answer	Marks Distribution	Total marks
1	<p style="text-align: center;">Part A</p> <p>a) <u>words &amp; Picture</u></p> <p>Many websites offer collections of images for viewing. How to find image we want? Ex: user enters a text query "Bicycle Race" Some of images will have keywords or captions attached or will be from web pages that contain text near image. For these image retrieval will be like text retrieval match text with query. How to annotate an image with incomplete keywords. Address the problem of predicting which tags to attach to which regions in a test image.</p> <p>⑤ <u>Reconstruction from many views.</u></p> <p>Explain four measurements (x, y) positions of point in each view &amp; unknown degrees of freedom as (x, y, z) coordinate values of point in the scene. Explain 30 points. Model-Building, Matching move, Path reconstruction</p>	2 1/2	
		5 Marks	

Staff Signature: \_\_\_\_\_

Vagdevi  
HOD

Q. No	Details of the Answer	Marks Distribution	Total marks
	<p>e) <u>Controlling Movement</u></p> <p>write principal uses of vision to provide information both for manipulatory objects, picking them up, grasping them, twisting them etc</p> <p>Ex: vision system for an automated vehicle driving on a freeway.</p> <p>write tasks faced by driver</p> <ol style="list-style-type: none"> <li>① lateral control</li> <li>② longitudinal control</li> <li>③ obstacle avoidance</li> </ol> <p>Explain each task.</p> <p>② <u>Reconstructing 3D world</u></p> <p>Introduction</p> <p>a) Explain Motion Parallax</p> <p>→ Equations of optical flow:</p> $v_x(x,y) = \frac{-T_x + x T_z}{z(x,y)} \quad v_y(x,y) = \frac{T_y + y T_z}{z(x,y)}$ <p><math>z(x,y)</math> is z-coordinate of pt in scene corresponding to pt in image at <math>(x,y)</math></p> <p><math>v_x(x,y)</math> &amp; <math>v_y(x,y)</math> are at zero at point <math>x = T_x/T_z, y = T_y/T_z</math> focus of expansion</p>	2 1/2	10.4

Staff Signature:

Vogel  
HOD

Q. No	Details of the Answer	Marks Distribution	Total marks
	<p><math>(x', y')</math> be new coordinates defined by  <math>x' = x - T_x/T_z</math>, <math>y' = y - T_y/T_z</math>. Then</p> $v_x(x', y') = \frac{x'T_z}{z(x', y')} \quad v_y(x', y') = \frac{y'T_z}{z(x', y')}$ <p>Extracting useful information - Explain &amp; points.</p> <p><u>Binocular Stereopsis</u></p> <p>Explain: <u>near disparity</u>, <u>measuring disparity</u>  Write Equations</p> $\delta o/z = \frac{b/z}{z} - \frac{b/z}{z + \delta z} \approx \frac{b\delta z}{z^2}$ <p>actual disparity is <math>\delta o</math></p> $\text{disparity} = \frac{b\delta z}{z^2}$ <p>Write about  Multiple view, Texture, Shading, Contour, objects &amp; geometric structure of scenes</p>	<p>(3)</p> <p>(2)</p> <p>(5)</p>	<p>10 marks</p>

Staff Signature:

Vogel  
HOD



Q. No

Details of the Answer

Marks Distribution

Total marks

Part B

- 3) Minimums Edit Distance Algorithm &  
- compute minimums Edit distance between  
lulor & tumor

Min Edit Distance Algorithm

Many NLP tasks are concerned with measuring how similar 2 strings are:

Min Edit distance between 2 strings is defined as min number of Editing operations (insertion, deletion, substitution) needed to transform one string into another  
with alg:

Min Edit distance b/w lulor & tumor

	#	t	u	m	o	u	r
#	0	1	2	3	4	5	6
t	1	0	1	2	3	4	5
u	2	2	0	1	2	3	4
t	3	2	1	1	2	3	4
o	4	3	2	2	1	2	3
r	5	4	3	3	2	2	2

Calculations to be shown.

5M

10 Marks

5M

Staff Signature:

Vagdevi  
HOD

**CITY ENGINEERING COLLEGE**

DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE  
LEARNING ENGINEERING

**SCHEME FOR EVALUATION**

**CIE TEST \_\_\_\_\_**

SEMESTER & SECTION:  
SUBJECT: \_\_\_\_\_

SUB CODE:  
DATE: \_\_\_\_\_

Q. No	Details of the Answer	Marks Distribution	Total marks
6	<p>Tokenize the sentence into bi-grams -</p> <p>Tokenize corpus &amp; target sentence into words</p> <p>Corpus tokens ("there", "is", "a", "big", "garden", "children", "play", "in", "a", "garden", "They", "play", "inside", "beautiful", "garden")</p> <p>Target sentence ("They", "play", "in", "a", "big", "garden")</p> <p><u>create bi-grams</u></p> <p>(("there", "is"), ("is", "a"), ("a", "big"), ("big", "garden"), ("children", "play"), ("play", "in"), ("in", "a"), ("a", "garden"), ("They", "play"), ("play", "inside"), ("inside", "beautiful"), ("beautiful", "garden"))</p> <p>calculate the Bi-gram probabilities</p> <p>compute overall probability</p> <p><math>P(\text{"They play in a big garden"}) = \underline{\underline{1 * 1 * 1 * 1 * 1 * 1}}</math></p>		

*Staff*

Staff Signature:

*Vaidyanath*

HOD

Q. No	Details of the Answer	Marks Distribution	Total marks
7	<p>challenges of NLP (any 5).</p> <ol style="list-style-type: none"> <li>① Interpretation &amp; Representation (Explain)</li> <li>② Inability to capture all the required knowledge (Explain)</li> <li>③ Identifying its semantics (Explain)</li> <li>④ Idioms, Metaphor &amp; Ellipsis (Explain)</li> <li>⑤ Quantification</li> <li>⑥ Ambiguity:               <ul style="list-style-type: none"> <li>① Lexical Ambiguity.</li> <li>② Syntactic Ambiguity</li> <li>③ Referential Ambiguity.</li> </ul> </li> </ol>	<p>5x2 = 10 marks</p>	<p>10 marks</p>
8	<p>n-gram model</p> <p>Goal of statistical model is to estimate prob of a sentence. This is achieved by decomposing sentence probability into a product of conditional probabilities using chain rule as follows:</p> $  \begin{aligned}  P(s) &= P(w_1, w_2, w_3, \dots, w_n) \\  &= P(w_1) P(w_2 w_1) P(w_3 w_1, w_2) \dots \\  &= \prod_{i=1}^n P(w_i   h_i) \quad \text{--- } P(w_n   w_1, w_2, \dots, w_{n-1}) \\  &\quad \text{--- } h_i = \text{history of word } w_i  \end{aligned}  $	<p>5M</p>	

Staff Signature:

Vagdevi  
HOD



Q. No	Details of the Answer	Marks Distribution	Total marks
10	<p>Early NLP systems .</p> <p>Explain</p> <ol style="list-style-type: none"> <li>① ELIZA</li> <li>② Syntian</li> <li>③ TAUH METEO</li> <li>④ SHROU</li> <li>⑤ LUNAR.</li> </ol>	5 X 2	10 Marks

*[Signature]*  
Staff Signature:

*[Signature]*  
HOD

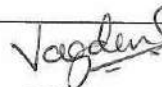
# CITY ENGINEERING COLLEGE

## Department of Artificial Intelligence & Machine Learning Engineering

### Counseling for Below Average Students

Date	USN	Student Name	Reason	Action	Student Signature
1	ICE20A1001	Abdul Fakhem	was facing difficulty to understand few concepts	Explained them one-to-one in the department	Abdul Fakhem

Staff: 

  
HOD:

Branch : AI

Semester : 7

SI NO.	USN	18AI71
1	1CE20AI001	35
2	1CE20AI002	36
3	1CE20AI003	36
4	1CE20AI004	39
5	1CE20AI006	35
6	1CE20AI007	34
7	1CE20AI008	40
8	1CE20AI009	36

Draft, As Entered in VTU CIE Portal on 2024-01-18 13:13:00



# CITY ENGINEERING COLLEGE

DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

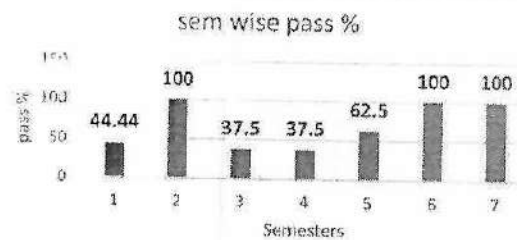
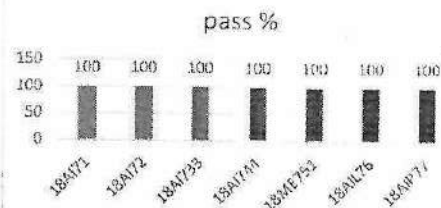
## VII Sem Result Analysis for the Exam Dec/Jan - 2024 (20 Batch)

Before Revaluation

Sl No	Subject Code	Subject Name	Staff	Total no of students Appeared	Fail	Absent	No of Students Pass	Pass %
1	18AI71	Advanced Artificial Intelligence	Mrs Vindhya R	8	0	0	8	100
2	18AI72	Advanced Machine Learning	Mr Mahesh Basavaraj	8	0	0	8	100
3	18AI733	Blockchain Technology	Mrs Anusha Shivaprakash	8	0	0	8	100
4	18AI744	Business Intelligence	Dr S Vagdevi	8	0	0	8	100
5	18ME75	Energy and Environment	Mr Harsha	8	0	0	8	100
6	18AIL76	AI&ML Application Development Lab	Mr Mahesh Basavaraj	8	0	0	8	100
7	18AIP77	Project Phase 1	Mrs Vindhya R	8	0	0	8	100
Total Pass %				8	0	0	8	100

No Of FCD	8
No OF FC	0
No Of SC	0

sem	pass %
1	44.44
2	100
3	37.5
4	37.5
5	62.5
6	100
7	100



pass %	
18AI71	100
18AI72	100
18AI733	100
18AI744	100
18ME751	100
18AIL76	100
18AIP77	100

HOD  
*[Signature]*

*[Signature]*  
PRINCIPAL









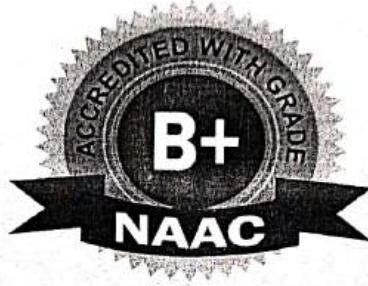




# CITY

ENGINEERING COLLEGE

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING



## COURSE FILE

NAME	Dr. Sunil A. N
DESIGNATION	Assoc. Prof
SEMESTER	I
SECTION	D, E
SUBJECT NAME/CODE	Applied Chemistry for CS stream BCH1ES102
ACADEMIC YEAR	2023-24



# CITY ENGINEERING COLLEGE

Approved by AICTE New Delhi & Affiliated by VTU, Belagavi  
Doddakallasandra, Off Kanakapura Main Road,  
Next to Gokulam Apartment, Bangalore - 560 062.



## DEPARTMENT OF APPLIED SCIENCE & HUMANITIES

### CIRCULAR

RefNo: CEC/S&H/DAC/ACY 2023-24/OR/01

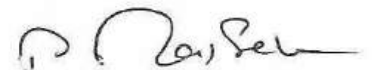
Date: 06-09-2023

This is to inform the members of Department Advisory Committee that meeting is scheduled on 08-09-2023 at 11: 00 AM in Physics Laboratory.

#### Agenda:

- Commencement of classes for 1<sup>st</sup> semester students
- Phase I Student Induction Programme for 1<sup>st</sup> semester students
- Conduction of Talents day
- Organizing value added courses/ circular courses in the curriculum
- Organizing Ramanujam Day on 13/12/2023
- Organizing sports exclusively for 1<sup>st</sup> semester students

  
PRINCIPAL  
CITY ENGINEERING COLLEGE  
Kanakapura Main Road, BANGALORE - 560 061

  
HOD



# CITY ENGINEERING COLLEGE

Approved by AICTE New Delhi & Affiliated by VTU, Belagavi  
Doddakallasandra, Off Kanakapura Main Road,  
Next to Gokulam Apartment, Bangalore - 560 062.



## DEPARTMENT OF APPLIED SCIENCE & HUMANITIES

### Department Advisory Committee Meeting

**Date: 08-09-2023**

**Time: 11:00 AM**

**Venue: Physics Laboratory**

DAC Members present in the meeting:

Sl. No	Member Name	Designation	Role	Signature
1	Dr. Rajasekhar. P	HOD & Professor	Convener	
2	Dr. Jyothi. P	HOD & Professor	Member	
3	Mrs. Nagasree. G	Assistant Professor	Member	
4	Dr. Sunitha. N	Associate Professor	Member	
5	Mrs. Vanitha. G.R	Assistant Professor	Member	
6	Mr. Rekha. R	Assistant Professor	Member	
7	Mrs. Anitha. C. V	Assistant Professor	Member	
8	Ms. Janavi. R	Assistant Professor	Member	
9	Ms. Bhavitha. B. G	Assistant Professor	Member	
10	Ms. Meghana.. D	Assistant Professor	Member	
11	Mrs. Swaroopini B S	Assistant Professor	Member	
12	Mr. Sadashiva. R	Assistant Professor	Member	
13	Mr. Dinesh	Assistant Professor	Member	
14.	Pallagolla Dwarakesh	VM WARE, Bangalore 9611250471	Member	

#### Agenda of the Meeting:

- Commencement of classes for 1<sup>st</sup> semester students
- Phase I Student Induction Programme for 1<sup>st</sup> semester students
- Conduction of Talents day
- Organizing value added courses/ circular courses in the curriculum
- National Mathematics Day is celebrated on 22 December to mark the birth anniversary of legendary Indian mathematician, Srinivasa Ramanujan as to be celebrated as Ramanujam Day on 13/12/2023 and organising an oral quiz on it.
- Organizing sports exclusively for 1<sup>st</sup> semester students.



# CITY ENGINEERING COLLEGE

Approved by AICTE New Delhi & Affiliated by VTU, Belagavi  
Doddakallasandra, Off Kanakapura Main Road,  
Next to Gokulam Apartment, Bangalore - 560 062.



## Minutes of Meeting:

The members discussed suggestions for improvement and reviewed the meeting agenda.

- The HOD emphasized the importance of societal projects and the need to find opportunities for such initiatives.
- The committee decided to organize value added course on Leadership and Management
- It was proposed to conduct Ramanujam Day on 13/12/2023 to mark the birth anniversary of legendary Indian mathematician, Srinivasa Ramanujan.
- It was discussed to conduct Talents day and sports day.

Convener  
Dr. Rajasekhar. P

HOD  
Dr. Rajasekhar. P





# ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ

("ವಿ ಟಿ ಯು ಅಧಿನಿಯಮ ೧೯೯೪" ರ ಅಡಿಯಲ್ಲಿ ಕರ್ನಾಟಕ ಸರ್ಕಾರದಿಂದ ಸ್ಥಾಪಿತವಾದ ರಾಜ್ಯ ವಿಶ್ವವಿದ್ಯಾಲಯ)

## VISVESVARAYA TECHNOLOGICAL UNIVERSITY

(State University of Government of Karnataka Established as per the VTU Act, 1994)

"JnanaSangama" Belagavi-590018, Karnataka, India



Prof. Dr. B. E. Rangaswamy, Ph.D.  
REGISTRAR

Phone: (0831) 2498100  
Fax : (0831) 2405467

REF: VTU/BGM/ACA/2023-24/ 2668

DATE: 25 AUG 2023

### NOTIFICATION

- Subject:** Tentative Academic Calendar of 1st semesters of B.E./B.Tech./B.Arch./B.Plan., and VII semester of B.E./B.Tech., programs of University regarding...
- Reference:** Dean faculty of Engineering, VTU Belagavi approval dated 24.08.2023  
Hon'ble Vice-Chancellor's approval dated: 24.08.2023

The tentative academic calendar concerned to 1st semesters of B.E./B.Tech./B.Arch./B.Plan., and VII semester of B.E./B.Tech., programs of University for academic year 2023-24 are hereby notified as mentioned below;

	I semester B.E./B.Tech (2022 scheme)	I semester B.Plan/B.Arch (2022 scheme)	VII semester B.E./B.Tech (2018 scheme)
Commencement of the Semester	04.09.2023	04.09.2023	14.08.2023
# Internship/Students Induction Program	04.09.2023 To 14.09.2023	04.09.2023 To 14.09.2023	14.08.2023 To 09.09.2023
Commencement of Classes	15.09.2023	15.09.2023	11.09.2023
Last Working day of the Semester	06.01.2024	06.01.2024	06.01.2024
Practical Examination	08.01.2024 To 19.01.2024	08.01.2024 To 19.01.2024	08.01.2024 To 19.01.2024
Theory Examinations	22.01.2024 To 17.02.2024	22.01.2024 To 17.02.2024	22.01.2024 To 09.02.2024
Commencement of NEXT Semester	19.02.2024	19.02.2024	13.02.2024

# Internship for VI semester completed students and Students Induction Program for 1<sup>st</sup> semester Students

#### Please Note:

- The academic sessions for ODD semesters should commence on the **date mentioned above.**

**\*\* Induction Program** shall be conducted for 11 days at the beginning of 1<sup>st</sup> semester and 10 days at the beginning of the 2<sup>nd</sup> semester. During the induction program, college has to brief about the new curriculum that implemented from the academic year 2022-23.

- If required, the college can plan to have extra classes on 1<sup>st</sup> and 3<sup>rd</sup> Saturday and Sundays to complete academic activities within the duration mentioned.
- The faculty/staff shall be available to undertake any work assigned by the university.
- Notification regarding the Calendar of Events relating to the conduct of University **Examinations** will be issued by the Registrar (Evaluation) from time to time.
- Academic Calendar **may be modified** based on guidelines/directions issued in the future by UGC/AICTE/State Government.
- Academic Calendar is also applicable for **Autonomous Colleges**. If any changes are to be effected by Autonomous Colleges in the academic terms and examination schedule, they could do so with the approval of the University.
- The circular related to AICTE Activity point will be issued by the Registrar's office separately.
- If any suggestions/clarification/correction, please email to -[sbhvtuso@yahoo.com](mailto:sbhvtuso@yahoo.com)

The Principals of Affiliated, Constituent and Autonomous Engineering Colleges, Chairpersons of the University departments are hereby informed to bring the academic calendar to the notice of all concerned.

Sd/-

REGISTRAR

To,

1. The Principals of all affiliated/ constituent /Autonomous Engineering Colleges under the ambit of VTU Belagavi.
2. The chairperson, of the Department of Mechanical Engineering /Civil Engineering /Computer Science and Engineering& Communication Electronics Engineering of the University.

Copy to.

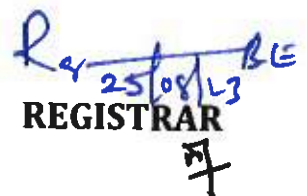
1. To the Hon'ble Vice-Chancellor through the secretary to VC, VTU Belagavi for information
2. The Registrar (Evaluation), VTU Belagavi for information.
3. The Regional Directors (I/c) of all the regional offices of VTU for circulation.
4. The Director I/c. ITI SMU, VTU Belagavi for information and to make arrangements to upload Academic Calendar on the VTU web portal.
5. The Director of Physical Education, VTU Belagavi for information
6. The Director, Central Placement Cell, VTU Belagavi for information
7. The Special Officer Library, VTU Belagavi for information
8. OS for information and make arrangements to send the circular regarding AICTE Activity Points
9. All the concerned Special Officer/s and Caseworker/s of the academic section, VTU, Belagavi



HOD



PRINCIPAL  
CITY ENGINEERING COLLEGE  
Kanakapura Main Road, BANGALORE - 560 061



REGISTRAR



# ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ

("ವಿ ಟಿ ಯು ಅಧಿನಿಯಮ ೧೯೯೪" ರ ಅಡಿಯಲ್ಲಿ ಕರ್ನಾಟಕ ಸರ್ಕಾರದಿಂದ ಸ್ಥಾಪಿತವಾದ ರಾಜ್ಯ ವಿಶ್ವವಿದ್ಯಾಲಯ)



## VISVESVARAYA TECHNOLOGICAL UNIVERSITY

(State University of Government of Karnataka Established as per the VTU Act, 1994) "Jnana Sangama" Belagavi-590018, Karnataka, India)

Prof. B. E. Rangaswamy, Ph.D.  
REGISTRAR

Phone: (0831) 2498100

Fax: (0831) 2405467

REF: VTU/BGM/ACA/2023-24 3618

DATE: 20 OCT 2023

### Revised-NOTIFICATION

**Subject:** Tentative Academic Calendar of 3rd semester of B.E./B.Tech. programs, regarding...

**Reference:** Hon'ble Vice-Chancellor's approval dated: 20.10.2023

The tentative academic calendar concerned to 3rd semester of B.E./B.Tech. programs, for academic year 2023-24 are hereby notified as mentioned below;

	III Semester B.E. / B. Tech. (2022 scheme)
Commencement of the Semester	15.11.2023 ✓
Internship	----
Commencement of Classes	15.11.2023 ✓
Last Working day of the Semester	20.02.2024 ✓
Practical Examination/ Internship Viva Voce/ Project viva	21.02.2024 To 29.02.2024 ✓
Theory Examinations	04.03.2024 To 23.03.2024 ✓
Commencement of NEXT Semester	01.04.2024 ✓

#### Please Note:

- The academic sessions for semesters should commence on the **date mentioned** above.
- If required, the college can plan to have extra classes on 1<sup>st</sup> and 3<sup>rd</sup> Saturday and Sunday to complete academic activities within the academic duration mentioned.

✓

- The faculty/staff shall be available to undertake any work assigned by the university.
- Notification regarding the Calendar of Events relating to the conduct of University **Re-Valuation/Make-up Examination/SEE Examinations** will be issued by the Registrar (Evaluation) from time to time.
- Academic Calendar **may be modified** based on guidelines/directions issued in the future by UGC/AICTE/State Government.
- Autonomous Colleges must adhere to the Academic Calendar as well. Any modifications to the academic terms and examination schedule that Autonomous Colleges choose to make can only be made with the University's agreement.
- If any suggestions/clarification please email to - [sbhvtuso@yahoo.com](mailto:sbhvtuso@yahoo.com)

The Principals of Non-Autonomous, Constituent, and Autonomous Engineering Colleges and chairpersons of the University departments are hereby informed to bring the academic calendar to the notice of all concerned.

Sd/-  
REGISTRAR

To,

1. The Principals of all Non-autonomous/ constituent /Autonomous Engineering Colleges under the ambit of VTU Belagavi.
2. The chairperson, of the Department of Mechanical Engineering /Civil Engineering /Computer Science and Engineering & Communication Electronics Engineering of the University.

Copy to.

1. To the Hon'ble Vice-Chancellor through the secretary to VC, VTU Belagavi for information
2. The Registrar (Evaluation), VTU Belagavi for information and needful.
3. The Regional Directors (I/c) of all the regional offices of VTU for circulation.
4. The Director ITI SMU, VTU Belagavi for information and to make arrangements to upload the Academic Calendar on the VTU web portal.
5. The Director of Physical Education, VTU Belagavi for information
6. The Director, Central Placement Cell, VTU Belagavi for information
7. The Special Officer Library, VTU Belagavi for information
8. All the concerned Special Officer/s and Caseworker/s of the academic section, VTU, Belagavi



HOD

  
PRINCIPAL  
CITY ENGINEERING COLLEGE  
Kanakapura Main Road, BANGALORE - 560 061

  
20/10/23  
REGISTRAR





# ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ

("ವಿ ಟಿ ಯು ಅಧಿನಿಯಮ ೧೯೯೪" ರ ಅಡಿಯಲ್ಲಿ ಕರ್ನಾಟಕ ಸರ್ಕಾರದಿಂದ ಸ್ಥಾಪಿತವಾದ ರಾಜ್ಯ ವಿಶ್ವವಿದ್ಯಾಲಯ)

## VISVESVARAYA TECHNOLOGICAL UNIVERSITY

(State University of Government of Karnataka Established as per the VTU Act, 1994)

"JnanaSangama" Belagavi-590018, Karnataka, India

Prof. Dr. B. E. Rangaswamy, Ph.D.  
REGISTRAR

Phone: (0831) 2498100  
Fax : (0831) 2405467

REF: VTU/BGM/ACA/2023-24/15174

DATE: 29 DEC 2023

### Revised-NOTIFICATION

**Subject:** Last working date and practical examinations dates POSTPONED for 1st semesters of B.E./B.Tech./B.Arch./B.Plan./B. Des., programs of University regarding...  
**Reference:** Hon'ble Vice-Chancellor's approval dated: 29.12.2023

The last working date and practical examinations dates are postponed for 1st semester of B.E./B.Tech./B.Arch./B.Plan./B. Des., programs for academic year 2023-24 the updated dates are mentioned in the last column of the table below;

	I semester B.E./B.Tech (2022 scheme)	I semester B.Plan /B.Arch (2021 scheme)	I semester B. Design (2022 scheme)	POSTPONED Dates
Commencement of the Semester	04.09.2023	04.09.2023	04.09.2023	04.09.2023
# Internship/Students Induction Program	04.09.2023 To 14.09.2023	04.09.2023 To 14.09.2023	04.09.2023 To 14.09.2023	04.09.2023 To 14.09.2023
Commencement of Classes	15.09.2023	15.09.2023	15.09.2023	15.09.2023
Last Working day of the Semester	06.01.2024	06.01.2024	06.01.2024	20.01.2024
Practical Examination	08.01.2024 To 19.01.2024	08.01.2024 To 19.01.2024	08.01.2024 To 19.01.2024	19.02.2024 To 01.03.2024
Theory Examinations	22.01.2024 To 17.02.2024	22.01.2024 To 17.02.2024	22.01.2024 To 17.02.2024	22.01.2024 To 17.02.2024
Commencement of NEXT Semester	19.02.2024	19.02.2024	19.02.2024	04.03.2024

The Principals of Affiliated, Constituent and Autonomous Engineering Colleges, Chairpersons of the University departments are hereby informed to bring the academic calendar to the notice of all concerned.

Sd/-  
REGISTRAR

To,

1. The Principals of all affiliated/ constituent /Autonomous Engineering Colleges under the ambit of VTU Belagavi.
2. The chairperson, of the Department of Mechanical Engineering /Civil Engineering /Computer Science and Engineering& Communication Electronics Engineering of the University.

Copy to.

1. To the Hon'ble Vice-Chancellor through the secretary to VC, VTU Belagavi for information
2. The Registrar (Evaluation), VTU Belagavi for information.
3. The Regional Directors (I/c) of all the regional offices of VTU for circulation.
4. The Director I/c. ITI SMU, VTU Belagavi for information and to make arrangements to upload Academic Calendar on the VTU web portal.
5. The Director of Physical Education, VTU Belagavi for information
6. The Director, Central Placement Cell, VTU Belagavi for information
7. The Special Officer Library, VTU Belagavi for information
8. OS for information and make arrangements to send the circular regarding AICTE Activity Points
9. All the concerned Special Officer/s and Caseworker/s of the academic section, VTU, Belagavi

*Rav* 29/12/23

**REGISTRAR**

*7.*

*P. P. S. Kumar*

HOD

  
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CITY ENGINEERING COLLEGE  
Kanakapura Main Road, BANGALORE - 560 061



# ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ

("ವಿ ಟಿ ಯು ಅಧಿನಿಯಮ 1994"ರ ಅಡಿಯಲ್ಲಿ ಕರ್ನಾಟಕ ಸರ್ಕಾರದಿಂದ ಸ್ಥಾಪಿತವಾದ ರಾಜ್ಯ ವಿಶ್ವವಿದ್ಯಾಲಯ)

## VISVESVARAYA TECHNOLOGICAL UNIVERSITY

(State University of Government of Karnataka Established as per the VTU Act, 1994)

Phone : 0831-2498100 / 2405468

Fax : 0831-2405467

Email : registrar@vtu.ac.in

Web : https://vtu.ac.in

Reference: VTU/BGM/AC /2023-24/5699

Dated: 16 JAN 2024

### Draft-NOTIFICATION

**Subject:** Revised Tentative Academic Calendar of VIII semester  
B.E/B.Tech./B.Arch/B.Plan programs regarding...

**Reference:** Dean Faculty of Engineering Approval Dated: 14.01.2024

The Draft academic calendar concerned to VIII semesters' of B.E./B.Tech./B.Arch/B.Plan programs for the academic year 2023-24 is hereby notified as follows;

	VIII semester B.E./B.Tech.,	VIII semester B. Plan	VIII semester B.Arch.
Commencement of the Semester	12.02.2024 ✓	26.02.2024 ✓	01.02.2024 ✓
Commencement of Classes	12.02.2024	26.02.2024	01.02.2024
Last Working Day of the Semester	11.05.2024	25.05.2024	25.05.2024
Practical Examination	-----	-----	27.05.2024 To 01.06.2024
Theory Examinations	13.05.2024 To 21.05.2024	03.06.2024 To 12.06.2024	03.06.2024 To 27.06.2024
Internship/Practical Exam for Lateral Entry Students	----	----	----
Internship Viva Voce/ Project viva	23.05.2024 To 30.05.2024	----	----
Commencement of NEXT Semester	----	----	01-07-2024

#### Please Note:

- The academic sessions for semesters should commence on the date mentioned above.

- If required, the college can plan to have extra classes on the 1st and 3rd Saturdays and Sundays to complete academic activities within the academic duration mentioned.
- The faculty/staff shall be available to undertake any work assigned by the university.
- Notification regarding the Calendar of Events relating to the conduct of University **Examinations** will be issued by the Registrar (Evaluation) from time to time.
- Academic Calendar **may be modified** based on guidelines/directions issued in the future by UGC/AICTE/State Government.
- Autonomous Colleges must adhere to the Academic Calendar as well. Any modifications to the academic terms and examination schedule that Autonomous Colleges choose to make can only be made with the University's concurrence.
- If any suggestions/clarification please email to [sbhalbhavi@vtu.ac.in](mailto:sbhalbhavi@vtu.ac.in)

The Principals of Non-Autonomous, Constituent, and Autonomous Engineering Colleges and chairpersons of the University departments are hereby informed to bring the academic calendar to the notice of all concerned.

Sd/-

REGISTRAR

To,

1. The Principals of all Non-autonomous/ constituent /Autonomous Engineering Colleges under the ambit of VTU Belagavi.
2. The chairperson, of the Department of Mechanical Engineering /Civil Engineering /Computer Science and Engineering & Communication Electronics Engineering of the University.

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8. All the concerned Special Officer/s and Caseworker/s of the academic section, VTU, Belagavi
9. Office copy

  
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 16/01/24  
 REGISTRAR  
 F.





# CITY ENGINEERING COLLEGE, BENGALURU-560061. ACADEMIC CALENDAR 2023-24 Odd SEM Revised on 25/10/2023

OCT 2023		NOV 2023		DEC 2023		JAN 2024		FEB 2024		March 2024		April 2024			
DAY	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	
SUN	1														
MON	2	GANDHI JAYANTHI					1	II test for 1st sem , III test for VII sem, I st test V sem, & III sem					1	Start of 4th sem	
TUE	3						2							2	
WED	4		1	RAJYOTSAVA DAY			3							3	
THU	5		2				4		1				4		
FRI	6		3			1	5		2		1		5		
SAT	7	1st Saturday holiday	4	1st Saturday holiday	2	Alumni Meet 1st Saturday holiday	6	Last Working day I & 7	3	1st Saturday holiday	2	1st Saturday holiday	6	1st Saturday holiday	
SUN	8		5		3		7		4		3		7		
MON	9		6	Ist test I sem and VII sem	4	II nd test VII sem, ATAL FDP – Basic (4 <sup>th</sup> – 9 <sup>th</sup> Dec)	8	Practical Exam I, 7	5	2nd test 3 <sup>rd</sup> sem V sem,	4	III test for V sem, Start of theory 3 <sup>rd</sup>	8		
TUE	10		7		5		9		6		5		9	Ugadhi, Ramzan	
WED	11		8		6		10		7		6		10		
THU	12		9		7		11		8		7		11		
FRI	13		10		8		12	Workshop for III Sem	9				8	Maha Shivarathri	
SAT	14	MAHALAYA AMAVASA	11		9		13		10		9	Last working day- 5th	13		
SUN	15		12		10		14		11		10		14		
MON	16		13		11	ATAL FDP Advanced (11 <sup>th</sup> – 16 <sup>th</sup> Dec)	15	Sankranthi	12		11	Start of practical 5th	15		
TUE	17		14	BALIPADYAMI	12		16		13	Start of 8th sem	12		16		
WED	18		15	Start of 3rd sem	13		17		14		13		17		
THU	19		16		14		18		15		14		18		
FRI	20		17		15		19		16	Guest Lecture	15		19		
SAT	21	3rd Saturday holiday	18	Graduation Day 3rd Saturday holiday	16	3rd Saturday holiday	20	3rd Saturday holiday	17	3rd Saturday holiday	16	3rd Saturday holiday	20	3rd Saturday holiday	
SUN	22		19		17		21		18		17		21		
MON	23	AYUDHA POOJA	20		18		22	THEORY EXAM 1 & 7	19	Start of 2 <sup>nd</sup> sem	18		22	Start of 6th sem	
TUE	24	VIJAYA DASHAMI	21		19		23		20	Last working day- 3rd	19		23		
WED	25	Start of 5th sem INTERNSHIP	22		20		24		21	Start of practical 3rd	20		24		
THU	26		23		21		25	Industrial Visit – V sem	22		21		25		
FRI	27		24		22	Alumni Interaction	26	Republic day	23		22	Start of theory 5th	26		
SAT	28	VALMIKI JAYANTHI	25	Start of 5th sem class	23		27		24		23		27		
SUN	29		26		24		28		25		24		28		
MON	30		27		25	CHRISTMAS	29		26		25	Holi	29		
TUE	31		28		26		30		27		26		30		
WED			29		27		31		28		27				
THU			30	KANAKADASA JAYANTHI	28				29		28				
FRI					29	Tech Symposium					29	Good Friday			
SAT					30						30				
SUN					31						31				

*(Signature)*



# CITY ENGINEERING COLLEGE, BENGALURU-560061. ACADEMIC CALENDAR 2023-24 Odd SEM Revised on 25/10/2023

OCT 2023		NOV 2023		DEC 2023		JAN 2024		FEB 2024		March 2024		April 2024				
DAY	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT		
SUN	1															
MON	2	GANDHI JAYANTHI					1	II test for 1st sem , III test for VII sem , I st test V sem, & III sem					1	Start of 4th sem		
TUE	3						2							2		
WED	4		1	RAJYOTSAVA DAY			3							3		
THU	5		2				4		1				4			
FRI	6		3		1		5		2		1		5			
SAT	7	1st Saturday holiday	4	1st Saturday holiday	2	1st Saturday holiday	6	Last Working day I & 7	3	1st Saturday holiday	2	1st Saturday holiday	6	1st Saturday holiday		
SUN	8		5		3		7		4		3		7			
MON	9		6	Ist test I sem and VII sem	4	II nd test VII sem,	8	Practical Exam I, 7	5	2nd test 3 <sup>rd</sup> sem V sem,	4	III test for V sem , Start of theory 3 <sup>rd</sup>	8			
TUE	10		7		5		9		6				5		9	Ugadhi, Ramzan
WED	11		8		6		10		7				6		10	
THU	12		9		7		11		8				7		11	
FRI	13		10		8		12		9				8		12	Maha Shivarathri
SAT	14	MAHALAYA AMAVASA	11		9		13		10		9	Last working day-5th	13			
SUN	15		12		10		14		11		10		14			
MON	16		13		11		15	Sankranthi	12		11	Start of practical 5th	15			
TUE	17		14	BALIPADYAMI	12		16		13	Start of 8th sem	12		16			
WED	18		15	Start of 3rd sem	13		17		14		13		17			
THU	19		16		14		18		15		14		18			
FRI	20		17		15		19		16		15		19			
SAT	21	3rd Saturday holiday	18	3rd Saturday holiday	16	3rd Saturday holiday	20	3rd Saturday holiday	17	3rd Saturday holiday	16	3rd Saturday holiday	20	3rd Saturday holiday		
SUN	22		19		17		21		18		17		21			
MON	23	AYUDHA POOJA	20		18		22	THEORY EXAM I & 7	19	Start of 2 <sup>nd</sup> sem	18		22	Start of 6th sem		
TUE	24	VIJAYA DASHAMI	21		19		23		20	Last working day-3rd	19		23			
WED	25	Start of 5th sem INTERNSHIP	22		20		24		21	Start of practical 3rd	20		24			
THU	26		23		21		25		22		21		25			
FRI	27		24		22		26	Republic day	23		22	Start of theory 5th	26			
SAT	28	VALMIKI JAYANTHI	25	Start of 5th sem class	23		27		24		23		27			
SUN	29		26		24		28		25		24		28			
MON	30		27		25	CHRISTMAS	29		26		25	Holi	29			
TUE	31		28		26		30		27		26		30			
WED			29		27		31		28		27					
THU			30	KANAKADASA JAYANTHI	28				29		28					
FRI					29						29	Good Friday				
SAT					30						30					
SUN					31						31					

*(Handwritten Signature)*



# CITY ENGINEERING COLLEGE

Approved by AICTE New Delhi & Affiliated by VTU, Belagavi  
Doddakallasandra, Off Kanakapura Main Road,  
Next to Gokulam Apartment, Bangalore - 560 062.



**ACADEMIC YEAR: 2023-24**

## DEPARTMENT OF APPLIED SCIENCE & HUMANITIES

### COURSE PREFERENCE

Name of the Faculty: Dr. Sunitha .N

Designation: Assoc. Prof.

Sl. No	Course Code and Name	Year/Semester
1.	BCHES102 Applied Chemistry for Computer Science & Engineering Scheme For D,E sections	2023/I

Signature of Faculty

  
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# CITY ENGINEERING COLLEGE

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Next to Gokulam Apartment, Bangalore - 560 062.



**Academic Year 2023-2024**

**Department of Applied Science & Humanities**

**Course Allocation for Odd semester**

Sl. No.	Name of the Faculty	Course code & Name	Year/Semester	Signature
1.	Dr. Rajasekhar. P	BCHE102 Applied Chemistry for Computer Science & Engineering Scheme	2023/I For F section	
2.	Dr. Sunitha .N	BCHE102 Applied Chemistry for Computer Science & Engineering Scheme	2023/I For D, E sections	
3.	Mr. Sadashiva .R	BCHE102 Applied Chemistry for Computer Science & Engineering Scheme	2023/I Laboratory	

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**CITY ENGINEERING COLLEGE**  
**TIMETABLE – FIRST SEMESTER – SEPTEMBER – 2023-24**  
**CHEMISTRY CYCLE**

SECTION: D


BRANCH: CS

ROOM NO: A004

DAY	9:00-10:00	10:00-11:00	11:00-11:20	11:20 -12:20	12:20-1:20	1:20-2:00	2:00-3:00	3:00-4:00	4:00-5:00
MON	BMATS101	BENGK106	<b>BREAK</b>	BPLCK105B	BCHE102	<b>LUNCH</b>	←--CHEL/ CEDL/MATL /D <sub>1</sub> /D <sub>2</sub> /D <sub>3</sub> ---->		
TUE	BPLCK105B	BESCK104C		BMATS101	BSFHK158		←----- PLCL / D1 ----->		
WED	BCHE102	BICOK107		BESCK104C			←--- CHEL/CEDL/MATL/D <sub>2</sub> /D <sub>3</sub> /D <sub>1</sub> -->		
THU	BESCK104C	←-CHEL/		CEDL/ MATL /D <sub>3</sub> /D <sub>1</sub> /D <sub>2</sub> →			←----- PLCL / D2 ----->		
FRI	BMATS101	BCHE102		BCEDK103			←----- PLCL / D3 ----->		
SAT	BMATS101 (T)	BCHE102 (T)		Proctor Meeting D1/D2/D3			DEPT/COLLEGE ACTIVITIES/LIBRARY		
SUBJECT CODE	SUBJECT NAME			NO. OF HOURS	FACULTY NAME				
BMATS101	Mathematics for CSE Stream			4	Janavi				
BCHE102	Chemistry for CSE Stream			4	Dr. Sunitha. N				
BCEDK103	Computer Aided Engineering Drawing			2	Dr.S. Karunakara/Anil				
BESCK104C	Introduction to Electronics Engineering			3	Viswakiran				
BPLCK105B	Introduction to Python Programming			2	Shruthi.B.S				
BENGK106	Communicative English			1	Swarupini				
BICOK107	Indian Constitution			1	Swarupini				
BSFHK158	Scientific Foundation of Health			1	Meghana				
MATL	Mat Lab			3x3	Anitha / Janavi				
CHEL	Chemistry Lab			3x3	Dr. P. Rajasekhar / Dr. Sunitha.N				
CEDL	Computer Aided Engineering Drawing Lab			3x3	Dr. S. Karunakara/ Anil				
PLCL	Python Programming Lab			3x3	Shruthi. B.S /				

*P. P. Raja Kumar*

HOD

  
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 CITY ENGINEERING COLLEGE  
 Kanakapura Main Road, BANGALORE - 560 061

**CITY ENGINEERING COLLEGE**  
**TIMETABLE – FIRST SEMESTER – SEPTEMBER – 2023-24**  
**CHEMISTRY CYCLE**

SECTION: E

BRANCH: CS

ROOM NO: A003

DAY	9:00-10:00	10:00-11:00	11:00-11:20	11:20 -12:20	12:20-1:20	1:20-2:00	2:00-3:00	3:00-4:00	4:00-5:00
MON	BESCK104C	BCHE102	<b>BREAK</b>	<b>BCEDK103</b>		<b>Lunch</b>	←----- PLCL / E1 -----→		
TUE	BMATS101	BICOK107		BCHE102	BESCK104C		←---CHEL/ CEDL/MATL/E <sub>1</sub> /E <sub>2</sub> /E <sub>3</sub> ---→		
WED	BESCK104C	←CHEL/		CEDL/MATL E <sub>2</sub> /E <sub>3</sub> /E <sub>1</sub> →			←-----PLCL / E2-----→		
THU	BCHE102	BMATS101		BPLCK105B			←---CHEL/ CEDL/MATL /E <sub>3</sub> /E <sub>1</sub> /E <sub>2</sub> ---→		
FRI	BPLCK105B	BENGK106		BMATS101	BCHE102 (T)		←----- PLCL / E3-----→		
SAT	BSFHK158	BMATS101 (T)		Proctor Meeting E1/E2/E3			DEPT/COLLEGE ACTIVITIES/LIBRARY		
<b>SUBJECT CODE</b>		<b>SUBJECT NAME</b>			<b>NO. OF HOURS</b>	<b>FACULTY NAME</b>			
BMATS101		Mathematics for CSE Stream			4	Bhavitha			
BCHE102		Chemistry for CSE Stream			4	Dr. Sunitha.N			
BCEDK103		Computer Aided Engineering Drawing			2	Dr. S. Karunakara /Anil			
BESCK104C		Introduction to Electronics Engineering			3	Shylaja.K			
BPLCK105B		Introduction to Python Programming			2	Shruthi. B. S			
BENGK106		Communicative English			1	Swarupini			
BICOK107		Indian Constitution			1	Swarupini			
BSFHK158		Scientific Foundation of Health			1	Meghana			
MATL		Mat Lab			3x3	Anitha / Janavi			
CHEL		Chemistry Lab			3x3	Dr. P.Rajasekhar / Dr. Sunitha.N			
CEDL		Computer Aided Engineering Drawing Lab			3x3	Dr. S. Karunakara/ Anil			
PLCL		Python Programming Lab			3x3	Shruthi. B.S /			

*P. P. Raja Kumar*

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# CITY ENGINEERING COLLEGE

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Next to Gokulam Apartment, Bangalore - 560 062.



## TIME TABLE – I SEMESTER 2023-24CHEMISTRY CYCLE

Dr. SUNITHA. N (SN)

DAY	9:00-10:00	10:00-11:00	11:00-11:20	11:20 -12:20	12:20-1:20	1:20-2:00	2:00-3:00	3:00-4:00	4:00-5:00
MON		E	BREAK	D			←-----D1 LAB SN+RS-----→		
TUE				E			←-----E1 LAB SN+RS-----→		
WED	D						←-----D2 LAB SN+RS-----→		
THU	E	←-----D3		LAB SN+RS-----→			←-----E3 LAB SN+RS-----→		
FRI		D				E			
SAT		D							

*Dr. Sunitha N*

HOD

*Dr. Swamy*  
PRINCIPAL  
CITY ENGINEERING COLLEGE  
Kanakapura Main Road, BANGALORE - 560 061

## Computer Science and Engineering and allied branches(Chemistry group)

Course Title:	Applied Chemistry for Computer Science & Engineering stream		
Course Code:	BCHES102/202	CIEMarks	50
Course Type(Theory/Practical/Integrated)	Integrated	SEEMarks	50
		Total Marks	100
TeachingHours/Week(L:T:P:S) <sup>1</sup>	2:2:2:0	Exam Hours	03
TotalHoursofPedagogy	40hoursTheory+ 10to12Labslots	Credits	04
<b>Courseobjectives</b> <ul style="list-style-type: none"> <li>Toenablestudentstoacquireknowledgeonprinciplesofchemistryforengineeringapplications.</li> <li>Todevelopanintuitiveunderstandingofchemistrybyemphasizingtherelatedbranchesofengineering.</li> <li>Toprovidestudentswithasolidfoundationinanalyticalreasoningrequiredtosolvesocietalproblems.</li> </ul>			
<b>Teaching-LearningProcess</b> Thesearesamplestrategies,whichteachercanusetoacceleratetheattainmentofthevariouscourseoutcomesandmakeTeaching-Learningmoreeffective <ul style="list-style-type: none"> <li>Tutorial&amp;remedialclassesforneedystudents(notregularT/R)</li> <li>ConductingMakeupclasses/Bridgecourses forneedystudents</li> <li>Demonstrationofconceptseitherbybuildingmodelsorbyindustryvisit</li> <li>Experimentsinlaboratoriesshallbeexecutedinblendedmode(conventionalornon-conventionalmethods)</li> <li>UseofICT-Onlinevideos,onlinecourses</li> <li>Useofonlineplatformsforassignments/Notes/Quizzes(Ex.Googleclassroom)</li> </ul>			
<b>MODULE1:SensorsandEnergySystems(8hr)</b>			
<b>Sensors:</b> Introduction,working,principleandapplicationsofConductometricsensors,Electrochemical sensors,Thermometricsensors (Flame photometry)andOpticalsensors (colorimetry).Sensorsforthemeasurement of dissolved oxygen (DO). Electrochemical sensors for the pharmaceuticals.ElectrochemicalgassensorsforSO <sub>x</sub> andNO <sub>x</sub> .Disposableensorsin thedetectionofbiomoleculesandpesticides.			
<b>EnergySystems:</b> Introductiontobatteries,construction,workingandapplicationsofLithiumionandSodiumionbatteries.QuantumDotSensitizedSolarCells(QDSSC's)-Principle, PropertiesandApplications.			
<b>Self-learning:</b> Types of electrochemical sensor, Gas sensor - O <sub>2</sub> sensor, Biosensor - Glucoseensors.			
<b>MODULE2:MaterialsforMemoryandDisplaySystems(8hr)</b>			
<b>Memory Devices:</b> Introduction, Basic concepts of electronic memory, History of organic/polymerelectronicmemorydevices,Classificationofelectronicmemorydevices,			

1.NOTE:Whereverthecontact hoursisnotsufficient,tutorialhourcanbeconvertedto theoryhours



types of organic memory devices (organic molecules, polymeric materials, organic-inorganic hybrid materials).

**Display Systems:** Photoactive and electroactive materials, Nanomaterials and organic materials used in optoelectronic devices. Liquid crystals (LC's) - Introduction, classification, properties and application in Liquid Crystal Displays (LCD's). Properties and application of Organic Light Emitting Diodes (OLED's) and Quantum Light Emitting Diodes (QLED's), Light emitting electrochemical cells.

**Self-learning:** Properties and functions of Silicon (Si), Germanium (Ge), Copper (Cu), Aluminium (Al), and Brominated flame retardants in computers.

### MODULE 3: Corrosion and Electrode System (8hr)

**Corrosion Chemistry:** Introduction, electrochemical theory of corrosion, types of corrosion - differential metal and differential aeration. Corrosion control - galvanization, anodization and sacrificial anode method. Corrosion Penetration Rate (CPR) - Introduction and numerical problem.

**Electrode System:** Introduction, types of electrodes. Ion selective electrode - definition, construction, working and applications of glass electrode. Determination of pH using glass electrode. Reference electrode - Introduction, calomel electrode - construction, working and applications of calomel electrode. Concentration cell - Definition, construction and Numerical problems.

**Analytical Techniques:** Introduction, principle and instrumentation of Conductometry; its application in the estimation of weak acid. Potentiometry; its application in the estimation of iron.

**Self-learning:** IR and UV-Visible spectroscopy.

### MODULE 4: Polymers and Green Fuels (8hr)

**Polymers:** Introduction, Molecular weight - Number average, weight average and numerical problems. Preparation, properties, and commercial applications of kevlar. Conducting polymers - synthesis and conducting mechanism of polyacetylene and commercial applications.

**Green Fuels:** Introduction, construction and working of solar photovoltaic cell, advantages, and disadvantages. Generation of energy (green hydrogen) by electrolysis of water and its advantages.

**Self-learning:** Regenerative fuel cells

### MODULE 5: E-Waste Management (8hr)

**E-Waste:** Introduction, sources of e-waste, Composition, Characteristics, and Need of e-waste management. Toxic materials used in manufacturing electronic and electrical products, health hazards due to exposure to e-waste. Recycling and Recovery: Different approaches of recycling (separation, thermal treatments, hydrometallurgical extraction, pyrometallurgical methods, direct recycling). Extraction of gold from E-waste. Role of stakeholders in environmental management of e-waste (producers, consumers, recyclers, and statutory bodies).

**Self-learning:** Impact of heavy metals on environment and human health.

### PRACTICAL MODULE

**A - Demonstration (any two) offline/virtual:**

A1. Chemical Structure drawing using software: ChemDraw or ACD/ChemSketch

A2. Determination of strength of an acid in Pb-acid battery  
A3: Synthesis of Iron-oxide Nanoparticles

A4. Electrolysis of water

**B–Exercise (compulsorily any 4 to be conducted):**

B1. Conductometric estimation of acid mixture

B2. Potentiometric estimation of FAS using  $K_2Cr_2O_7$

B3. Determination of pKa of vinegar using pH sensor (Glass electrode)

B4. Determination of rate of corrosion of mild steel by weight loss method  
B5. Estimation of total hardness of water by EDTA method

Estimation of total hardness of water by EDTA method

**C–Structured Enquiry (compulsorily any 4 to be conducted):**

C1. Estimation of Copper present in electroplating effluent by optical sensor

(colorimetry)  
C2. Determination of Viscosity coefficient of lubricant (Ostwald's viscometer)

C3. Estimation of iron in TMT bar by diphenyl amine/external indicator

method  
C4. Estimation of Sodium present in soil/effluent sample using flame photometry

C5. Determination of Chemical Oxygen Demand (COD) of industrial wastewater sample

**D–Open Ended Experiments (any two):**

D1: Evaluation of acid content in beverages by using pH sensors and simulation.  
D2. Construction of photovoltaic cell.

Construction of photovoltaic cell.

D3. Design an experiment to identify the presence of proteins in given sample.

D4. Searching suitable PDB file and target for molecular docking

**Course outcome (Course Skill Set)**

At the end of the course the student will be able to:

<b>CO1.</b>	Identify the terms processes involved in scientific and engineering and applications
<b>CO2.</b>	Explain the phenomena of chemistry to describe the methods of engineering processes
<b>CO3.</b>	Solve the problems in chemistry that are pertinent in engineering applications
<b>CO4.</b>	Apply the basic concepts of chemistry to explain the chemical properties and processes
<b>CO5.</b>	Analyze properties and multi processes associated with chemical substances in disciplinary situations

**Assessment Details (both CIE and SEE)**

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50). The minimum passing mark for the SEE is 35% of the maximum marks (18 marks out of 50). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination (SEE), and a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

**Continuous Internal Evaluation (CIE):**

The CIE marks for the theory component of the IC shall be **30 marks** and for the laboratory component **20 Marks**.

**CIE for the theory component of the IC**

- Three Tests each of 20 Marks; after the completion of the syllabus of 35-40%, 65-70%, and 90-100% respectively.
- Two Assignments/two quizzes/ seminars/one field survey and report presentation/one-course project totalling 20 marks.

Total Marks scored (test + assignments) out of 80 shall be scaled down to **30 marks**

**CIE for the practical component of the IC**

- On completion of every experiment/program in the laboratory, the students shall be evaluated and marks shall be awarded on the same day. The **15 marks** are for conducting the experiment and preparation of the laboratory record, the other **05 marks shall be for the test** conducted at the end of the semester.
- The CIE marks awarded in the case of the Practical component shall be based on the continuous evaluation of the laboratory report. Each experiment report can be evaluated for 10 marks. Marks of all experiments' write-ups are added and scaled down to 15 marks.
- The laboratory test (**duration 03 hours**) at the end of the 15<sup>th</sup> week of the semester /after completion of all the experiments (whichever is early) shall be conducted for 50 marks and scaled down to **05 marks**.

Scaled-down marks of write-up evaluations and tests added will be CIE marks for the laboratory component of IC/IPCC for **20 marks**.

- The minimum marks to be secured in CIE to appear for SEE shall be 12 (40% of maximum marks) in the theory component and 08 (40% of maximum marks) in the practical component. The laboratory component of the IC/IPCC shall be for CIE only. However, in SEE, the questions from the laboratory component shall be included. The maximum of 05 questions is to be set from the practical component of IC/IPCC, the total marks of all questions should not be more than 25 marks.

The theory component of the IC shall be for both CIE and SEE.

#### **Semester End Examination(SEE):**

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the subject (**duration 03 hours**)

- The question paper shall be set for 100 marks. The medium of the question paper shall be English/Kannada). The duration of SEE is 03 hours.
- The question paper will have 10 questions. Two questions per module. Each question is set for 20 marks. The students have to answer 5 full questions, selecting one full question from each module. The student has to answer for 100 marks and **marks scored out of 100 shall be proportionally reduced to 50 marks**.

There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), **should have a mix of topics** under that module.

#### **Suggested Learning Resources:**

##### **Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)**

1. Wiley Engineering Chemistry, Wiley India Pvt. Ltd. New Delhi, 2013-2<sup>nd</sup> Edition.
2. Engineering Chemistry, Satyaprakash & Manisha Agrawal, Khanna Book Publishing, Delhi
3. A Text Book of Engg. Chemistry, Shashi Chawla, Dhanpat Rai & Co. (P) Ltd.
4. Essentials of Physical Chemistry, Bahl & Tuli, S. Chand Publishing
5. Applied Chemistry, Sunita Rattan, Kataria 5. Engineering Chemistry, Baskar, Wiley
6. Engineering Chemistry – I, D. Gour Krishna, Vikas Publishing
7. A Textbook of Engineering Chemistry, S. Dara & Dr. S. S. Umare, S. Chand & Company Ltd., 12<sup>th</sup> Edition, 2011.
8. A Textbook of Engineering Chemistry, R. V. Gadag and Nityananda Shetty, I. K. International Publishing House, 2<sup>nd</sup> Edition, 2016.
9. Textbook of Polymer Science, F. W. Billmeyer, John Wiley & Sons, 4<sup>th</sup> Edition, 1999.
10. Nanotechnology: A Chemical Approach to Nanomaterials, G. A. Ozin & A. C. Arsenault, RSC Publishing, 2005
11. Corrosion Engineering, M. G. Fontana, N. D. Greene, McGraw Hill Publications, New York, 3<sup>rd</sup> Edition, 1996.

12. Linden's Handbook of Batteries, Kirby W. Beard, Fifth Edition, McGraw Hill, 2019.
13. OLED Display Fundamentals and Applications, Takatoshi Tsujimura, Wiley-Blackwell, 2012
14. Supercapacitors: Materials, Systems, and Applications, Max Lu, Francois Beguin, Elzbieta Frackowiak, Wiley-VCH; 1st edition, 2013.
15. "Handbook on Electroplating with Manufacture of Electrochemicals", ASIAPACIFIC BUSINESS PRESS Inc., 2017. Dr.H. Panda,
16. Expanding the Vision of Sensor Materials. National Research Council 1995, Washington, DC: The National Academies Press. doi:10.17226/4782.
17. Engineering Chemistry, Edited by Dr. Mahesh Band and Dr. Roopashree B, Sunstar Publisher, Bengaluru, ISBN 978-93-85155-70-3, 2022
18. High Performance Metallic Materials for Cost Sensitive Applications, F.H. Froes, et al. John Wiley & Sons, 2010
19. Instrumental Methods of Analysis, Dr. K.R. Mahadik and Dr. L. Sathiyarayanan, Nirali Prakashan, 2020
20. Principles of Instrumental Analysis, Douglas A. Skoog, F. James Holler, Stanley R. Crouch Seventh Edition, Cengage Learning, 2020
21. Polymer Science, VR Gowariker, NV Viswanathan, Jayadev, Sreedhar, Newage Int. Publishers, 4th Edition, 2021
22. Engineering Chemistry, PC Jain & Monica Jain, Dhanpat Rai Publication, 2015-16<sup>th</sup> Edition.
23. Nanostructured materials and nanotechnology, Hari Singh, Nalwa, academic press, 1<sup>st</sup> Edition, 2002.
24. Nanotechnology Principles and Practices, Sulabha K Kulkarni, Capital Publishing Company, 3<sup>rd</sup> Edition 2014
25. Principles of nanotechnology, Phanikumar, Scitech publications, 2<sup>nd</sup> Edition, 2010.
26. Chemistry for Engineering Students, B.S. Jai Prakash, R. Venugopal, Sivakumaraiah & Pushpa Iyengar., Subash Publications, 5<sup>th</sup> Edition, 2014
27. "Engineering Chemistry", O.G. Palanna, Tata McGraw Hill Education Pvt. Ltd. New Delhi, Fourth Reprint, 2015.
28. Chemistry of Engineering materials, Malini S, KS Anantha Raju, CBS publishers Pvt Ltd.,
29. Laboratory Manual Engg. Chemistry, Anupma Rajput, Dhanpat Rai & Co.

#### **Weblinks and Video Lectures (e-Resources):**

- <http://libgen.rs/>
- <https://nptel.ac.in/downloads/122101001/>
- <https://nptel.ac.in/courses/104/103/104103019/>
- <https://ndl.iitkgp.ac.in/>
- <https://www.youtube.com/watch?v=faESCxAWR9k>
- <https://www.youtube.com/watch?v=TBqXMWaxZYM&list=PLyhmwFtznRhuz8L1bb3X-9IbHrDMjHWWH>
- <https://www.youtube.com/watch?v=j5Hml6KN4TI>
- <https://www.youtube.com/watch?v=X9GHBdyYcyo>
- <https://www.youtube.com/watch?v=1xWBPZnEJk8>
- <https://www.youtube.com/watch?v=wRAo-M8xBHM>

**ActivityBasedLearning(SuggestedActivitiesinClass)/PracticalBasedlearning**

- <https://www.vlab.co.in/broad-area-chemical-sciences>
- <https://demonstrations.wolfram.com/topics.php>
- <https://interestingengineering.com/science>

**COsandPOsMapping(Individualteacherhastofillup)****PO**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	1	1				1					
CO2	3	1	1				1					
CO3	3	1	1				1					
CO4	3	1	1				1					
CO5	3	1	1				1					

*P. R. S. Kumar*

HOD

*S. S. Swamy*  
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# CITY ENGINEERING COLLEGE

## DEPARTMENT OF CHEMISTRY

### LESSON PLAN FOR EVEN SEMESTER FOR ACADEMIC YEAR 2023-2024

Course Title: <b>Engineering Chemistry</b>	Course Code : BCHES102
Total contact hours: L:T:P:S :: 2:2:2:0	SEE Marks : 50
Internal Marks : 50	CIE Marks: 50
Course : Integrated	Academic year : 2023-2024
Lesson plan Author: Dr. P. Rajasekhar & Dr. Sunitha. N, Mr. Sadashiva.R	Date : 15/11/2023

#### Course Objective:

- To enable students to acquire knowledge on principles of chemistry for engineering applications.
- To develop an intuitive understanding of chemistry by emphasizing the related branches of engineering.
- To provide students with a solid foundation in analytical reasoning required to solve societal problems.

#### **Teaching-Learning Process (General Instructions):**

These are sample Strategies; which teachers can use to accelerate the attainment of the various course outcomes and make teaching-learning more effective.

- Tutorial & remedial classes for need y students
- Conducting makeup classes/bridge courses for needy students
- Experiments in laboratories shall be executed in blended mode
- Use of ICT-online videos, online courses
- Use of online platforms for assignments/notes/quizzes

Week	Days/ Date	MODULE -1	Bloom's Taxonomy Level	Course Outcome (CO)
1	1	<b>Sensors:</b> working, principle and applications of Conductometric sensors	R, U	CO1
	2	working, principle and applications of Thermometric sensors	R,U	CO1
	3	Working, principle and applications Optical sensors (colorimetry )	R,U	CO1
	4	working, principle and applications of Electrochemical sensors	R,U	CO1
2	1	Sensors for the measurement of dissolved oxygen (DO)	R,U	CO1
	2	Electrochemical sensors for the pharmaceuticals	R,U	CO1
	3	Electrochemical gas sensors for Sox and NOx.	R,U	CO1
	4	<b>Energy Systems:</b> construction, working and applications of Lithium ion batteries	R,U	CO1

3	1	construction, working and applications of Sodium ion batteries	R,U	CO2
	2	Quantum Dot Senaitized Solar cells (QDSSC'S) Principle, properties and applications.	R,U	CO2
		<b>MODULE-2</b>		
	3	<b>Memory Devices:</b> Classification of electronic memory devices	R,U	CO2
	4	Types of organic memory devices (organic molecules, polymeric materials, organic inorganic hybrid materials).	R,U	CO2
4	1	Photoactive and electroactive materials	R,U	CO2
	2	Nano materials and organic materials used in optoelectronic devices.	R,U	CO2
	3	Properties and application of Organic Light Emitting Diodes (OLED's)	R,U	CO2
	4	Light emitting electrochemical cells	R,U	CO2
5	1	<b>Display Systems:</b> Liquid crystals (LC's) - Introduction, classification, properties and application in Liquid Crystal Displays (LCD's).	R,U	CO2
	2	Properties and application of Quantum Light Emitting Diodes (QLED's)	R,U	CO2
		<b>MODULE-3</b>		
	3	<b>Corrosion:</b> Introduction, electrochemical theory of corrosion	R,U	CO3
	4	Types of corrosion- Differential metal and aeration corrosion	R,U	CO3
6	1	Corrosion control: Galvanization, anodisation	E	CO3

	2	Sacrificial anode method, CPR - Introduction	R,U	CO3
	3	Numerical problems	E	CO3
	4	<b>Electrode System:</b> Introduction, types of electrodes, Calomel electrode construction and its working	R,U	CO3
7	1	Construction and working of concentration cell	R,U	CO3
	2	Numerical Problems	E	CO3

	3	Ion selective electrode- construction and working of Ion selective electrode	R,U	CO3
	4	Determination of pH using Glass electrode	R,U	CO3
	1	Analytical Techniques: Introduction, principle and instrumentation of conductometry	R,U	CO3
8	2	Application in the estimation of weak acid	R,U	CO4
	3	Introduction, principle and instrumentation of potentiometry	R,U	CO4
	4	Application in the estimation of Fe	R,U	CO4
		<b>MODULE-4</b>		
9	1	<b>Polymers:</b> Introduction, Molecular weight - Number average, weight average and numerical problems.	R,U, E	CO4
	2	Preparation, properties, and commercial applications of kevlar.	R,U	CO4
	3	Synthesis and conducting mechanism of polyacetylene and commercial applications.	R,U	CO4
	4	Preparation, properties and commercial applications of graphene	R,C,U	CO4
10	1	<b>Green Fuels:</b> Introduction, Construction and working of solar photovoltaic cell	C	CO4

	2	Generation of H <sub>2</sub> by electrolysis of water	R,U,	CO5
	3	Generation of H <sub>2</sub> by polymer membrane electrolysis.	R,U	CO5
		<b>MODULE-5</b>		
	4	Introduction, sources of e-waste Composition	R,U	CO5
11	1	Characteristics and need of e-waste management.	R,U	CO5
	2	Toxic materials used in manufacturing electronic and electrical products	R,U	CO5
	3	Health hazards due to exposure to e-waste	R,U	CO5
	4	Different approaches of recycling separation, thermal treatments	R,U	CO5
12	1	Hydrometallurgical extraction, pyro metallurgical method	R,U	CO5
	2	Direct recycling	R,U	CO5
	3	Role of stakeholders in environmental management of e-waste	R,U	CO5
	4	Extraction of gold from e-waste	R,U	CO5



## **Bloom's Taxonomy Level (L)**

L1- Remembering L2- Understanding L3- Applying L4- Analysing L5-Evaluating L6-Creating

Course outcome (Course Skill Set) At the end of the course the student will be able to:

CO1. Identify the terms and applications processes involved in scientific and engineering

CO2. Explain the phenomena of chemistry to describe the methods of engineering processes

CO3. Solve the problems in chemistry that are pertinent in engineering applications

CO4. Apply the basic concepts of chemistry to explain the chemical properties and processes

CO5. Analyze properties and multi disciplinary situations processes associated with chemical substance

## **Suggested Learning Resources: Books**

(Title of the Book/Name of the author/Name of the publisher/Edition and Year)

1. Wiley Engineering Chemistry, Wiley India Pvt. Ltd. New Delhi, 2013-2<sup>nd</sup> Edition.
2. Engineering Chemistry, Satyaprakash & Manisha Agrawal, Khanna Book Publishing, Delhi
3. A Text Book of Engg. Chemistry, Shashi Chawla, Dhanpat Rai & Co. (P) Ltd.
4. Essentials of Physical Chemistry, Bahl & Tuli, S. Chand Publishing
5. Applied Chemistry, Sunita Rattan, Kataria
5. Engineering Chemistry, Baskar, Wiley
6. Engineering Chemistry–I, D. Grouer Krishana, Vikas Publishing
7. A Textbook of Engineering Chemistry, S S Dara & Dr. S S Umare, S Chand & Company Ltd., 12<sup>th</sup> Edition, 2011.
8. A Text Book of Engineering Chemistry, R. V. Gadag and Nityananda Shetty, I. K. International Publishing house. 2<sup>nd</sup> Edition, 2016.
9. Text Book of Polymer Science, F. W. Billmeyer, John Wiley & Sons, 4<sup>th</sup> Edition, 1999.
10. Nano technology A Chemical Approach to Nanomaterials, G. A. Ozin & A. C. Arsenault, RSC Publishing, 2005 .
11. Corrosion Engineering, M. G. Fontana, N. D. Greene, McGraw Hill Publications, New York, 3<sup>rd</sup> Edition, 1996.
12. Linden's Handbook of Batteries, Kirby W. Beard, Fifth Edition, McGraw Hill, 2019.
13. OLED Display Fundamentals and Applications, Takatoshi Tsujimura, Wiley–Blackwell, 2012
14. Supercapacitors: Materials, Systems, and Applications, Max Lu, Francois Beguin, Elzbieta Frackowiak, Wiley-VCH; 1<sup>st</sup> edition, 2013.
15. "Handbook on Electroplating with Manufacture of Electrochemicals", ASIAPACIFIC BUSINESS PRESS Inc., 2017. Dr. H. Panda,
16. Expanding the Vision of Sensor Materials. National Research Council 1995, Washington, DC: The National Academies Press. doi:10.17226/4782.
17. Engineering Chemistry, Edited by Dr. Mahesh Band and Dr. Roopashree B, Sunstar Publisher, Bengaluru, ISBN 978-93-85155-70-3, 2022
18. High Performance Metallic Materials for Cost Sensitive Applications, F. H. Froes, et al. John Wiley & Sons, 2010
19. Instrumental Methods of Analysis, Dr. K. R. Mahadik and Dr. L. Sathiyarayanan, Nirali Prakashan, 2020
20. Principles of Instrumental Analysis, Douglas A. Skoog, F. James Holler, Stanley R. Crouch Seventh Edition, Cengage Learning, 2020
21. Polymer Science, VR Gowariker, NV Viswanathan, Jayadev, Sreedhar, Newage Int. Publishers, 4<sup>th</sup> Edition, 2021
22. Engineering Chemistry, PC Jain & Monica Jain, Dhanpat Rai Publication, 2015-16<sup>th</sup> Edition.
23. Nanostructured materials and nanotechnology, Hari Singh, Nalwa, academic press, 1<sup>st</sup> Edition, 2002.
24. Nanotechnology Principles and Practices, Sulabha Kulkarni, Capital Publishing Company, 3<sup>rd</sup> Edition 2014
25. Principles of nanotechnology, Phanikumar, Scitech publications, 2<sup>nd</sup> Edition, 2010.
26. Chemistry for Engineering Students, B. S. Jai Prakash, R. Venugopal, Sivakumaraiah & Pushpa Ingar., Subash Publications, 5<sup>th</sup> Edition, 2014

27. "Engineering Chemistry", O.G. Palanna, Tata McGraw Hill Education Pvt. Ltd. New Delhi, Fourth Reprint, 2015.

28. Chemistry of Engineering materials, Malini S, K S Anantha Raju, CBS Publishers Pvt Ltd.,

29. Laboratory Manual Engg. Chemistry, Anupma Rajput, Dhanpat Rai & Co.

**Web links and Video Lectures (e-Resources):**

- <http://libgen.rs/>
- <https://nptel.ac.in/downloads/122101001/>
- <https://nptel.ac.in/courses/104/103/104103019/>
- <https://ndl.iitkgp.ac.in/>
- <https://www.youtube.com/watch?v=faESCxAWR9k>
- <https://www.youtube.com/watch?v=TBqXMWaxZYM&list=PLyhmwFtznRhuz8L1bb3X-9IbHrDMjHWWh>
- <https://www.youtube.com/watch?v=j5Hml6KN4TI>
- <https://www.youtube.com/watch?v=X9GHBdyYcyo>
- <https://www.youtube.com/watch?v=1xWBPZnEJk8>
- <https://www.youtube.com/watch?v=wRAo-M8xBHM>

**Activity Based Learning (Suggested Activities in Class)/Practical Based learning**

<https://www.vlab.co.in/broad-area-chemical-sciences>

<https://demonstrations.wolfram.com/topics.php>

<https://interestingengineering.com/science>



HOD



PRINCIPAL  
CITY ENGINEERING COLLEGE  
Kanakapura Main Road, BANGALORE - 560 061

# CITY ENGINEERING COLLEGE

**BRANCH: Computer Science & Engineering-**

**List of Students Admitted to I Year I Semester -2023-24**

## SECTION 'D' CHEMISTRY CYCLE

Sl. No.	Name of the Student	Batch		
1	ADITHYA K M	<b>D1</b>		
2	AFNAN PASHA			
3	AKASH C P			
4	AKASH J GOWDA			
5	AKASHRAJ V T			
6	AMAR NARAYANA N C			
7	ANAGHA N			
8	ANITHA K			
9	ANJAN P			
10	ANKITHA			
11	ANUSHA A			
12	ARYAN TIWARI			
13	ASHA P			
14	ASHUTOSH B CHEREKAR			
15	AYUSH UPADHYA			
16	bhavan			
17	BHAVANA N S			
18	BHAVANI			
19	BHOOMIKA P			
20	BHUMIKA BALAGANUR			
21	BINDUSHREE K M			
22	C H HARIKISHAN REDDY			
23	CHANDAN D R	<b>D2</b>		
24	CHANDANA V			
25	CHANDRAKANTH V			
26	CHARITHA C			
27	CHETAN B N			
28	CHETHANA S Y			
29	CHINMAYI P N			
30	D M MANYA			
31	DANDU VENKATA SAI			
32	DARSHA V			
33	DARSHAN B S			
34	DARSHAN GOWDA M			
35	DEEPIKA S J			
36	DINESH C			

# CITY ENGINEERING COLLEGE

**BRANCH: Computer Science & Engineering-**

**List of Students Admitted to I Year I Semester -2023-24**

**SECTION 'D' CHEMISTRY CYCLE**

Sl. No.	Name of the Student	Batch		
37	DIVYA	<b>D3</b>		
38	EVANS J			
39	FEROZ AHMED			
40	GAGANA D C			
41	GOVINDARAJU S N			
42	HARI R			
43	HARSHITH L			
44	HARSHITHA M			
45	HEMANTH A N			
46	INDU			
47	JEEVAN T			
48	KALLESH H V			
49	KEERTHI S			
50	KESHAV G K			
51	KUSHMITHA P			
52	LEEKHITHA D B			
53	LEKHANA D R			
54	LEPAKSH S GUJAR			
55	LIKHITHA C			
56	LIKHITHA R K			
57	M MOHAMMED HAMEEM			
58	M. KISHORE			
59	MADHUMITHA S			
60	RAVICHANDRAN V			
61	AJAY K S			
62	MOHAMMED FAIZAN			
63	ACHUTA S			
64	ADITHYA S			
65	AKHILESH			
66	BINDU T			
67	CHARAN G			
68	DARSHAN C			

**Signature of Principal**



HOD



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CITY ENGINEERING COLLEGE  
Kanakapura Main Road, BANGALORE - 560 061

# CITY ENGINEERING COLLEGE

**BRANCH: Computer Science & Engineering-**

**List of Students Admitted to I Year I Semester -2023-24**

## SECTION 'E' CHEMISTRY CYCLE

Sl. No.	Name of the Student	Batch		
1	MANIKANTA K S	<b>E1</b>		
2	MANISH S			
3	MANOJ GOWDA B S			
4	MEGHANA S			
5	MOHITH P			
6	MONIKA S			
7	MONIKA T P			
8	N VISHAL ATHRESH			
9	NANDINI K			
10	NANDISH BASAVARAJ NEELGUND			
11	NIDHI R KUMAR			
12	NIKHITHA S			
13	NIRUPADI			
14	Parinitha n			
15	PAVAN			
16	PAVITHRA R			
17	POOJA G			
18	PRAJWAL KASHYAP G M			
19	PRARTHANA S			
20	PRATIKSHA D NAIK			
21	PRAVALIKA R			
22	PREM S			
23	PRIYANKA R			
24	PUNEETH S			
25	RAHUL K S	<b>E2</b>		
26	RAJESHWARI KANNAL			
27	RAKSHITH U V			
28	RAKSHITHA CHAPPALAGANV			
29	RASHMI C			
30	RASHMI SANTOSH BADIGER			
31	RAVEENA P V			
32	RAVI KUMAR			
33	ROHAN R			
34	S K SAMIM AKTAR			
35	S MOHAMMED SAD			
36	SADEEQ AHMED R			
37	SAHANA PUJARI			
38	SAKSHI N J			
39	SAMARTH M			
40	SAMMED NARASU TERADALE			
41	SANJAY M B			
42	Seema kumari			

# CITY ENGINEERING COLLEGE

**BRANCH: Computer Science & Engineering-**

**List of Students Admitted to I Year I Semester -2023-24**

**SECTION 'E' CHEMISTRY CYCLE**

Sl. No.	Name of the Student	Batch			
43	SHAIKH PARVEZ				
44	SHASHANK H M				
45	SHAZIYA NASRIN O C				
46	SHIVARAJ E				
47	SHIVRAJ HUDEVU N				
48	SHREYAS M R				
49	SRUJAN ANAND NAIK		<b>E3</b>		
50	SUCHITHA S				
51	SUNITHA S				
52	SWAMI O MATAD				
53	V VIJWAL				
54	VAISHALI MUDHOL				
55	VARSHINI K				
56	VARUN M J				
57	VEDANTH GOWDA N				
58	VIPUL R				
59	VISHWAS R				
60	ZAINAB FATHIMA				
61	MOHAMMED TAJAMUL				
62	SHALINI R				
63	TEJAS C				
64	KUSUMA H E				
65	NAMRATHA N				
66	DARSHAN S				
67	DEEPAK J P				
68	DILEEP KUMAR S				
69	e s akash				
70	HEMANTH G C				
71	ADITHYA H R				

**Signature of Principal**



**HOD**



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**CITY ENGINEERING COLLEGE**  
Kanakapura Main Road, BANGALORE - 560 061

Visvesvaraya Technological University, Belagavi

Scheme: 2022 (CBCS)

Stream: Computer Science and Engineering and allied branches

Course Title: Chemistry for Computer Science & Engineering stream

Semester I/II

Question Bank

Sub Code: BCHES102/202

NOTE: Question Bank is Prepared as per Blow-up of Syllabus

MODULE 1: Sensors and Energy Systems			
Sl No	QUESTIONS	RBT Level	Marks
1	Define the following: Sensor, transducer and actuator.	L1	6
2	What are electrochemical sensors? Explain the principle and working of electrochemical sensors and mention the applications of electrochemical sensors.	L2	7
3	Discuss the principle, working and applications of conductometric sensors.	L2	7
4	Discuss the principle, working and applications of optical sensors.	L2	7
5	What are Electrochemical Sensors? Explain its application in the measurement of Dissolved Oxygen (DO)	L2	7
6	Explain the detection of pharmaceutical pollutant diclofenac using Electrochemical sensor with electro-oxidation reactions.	L2	7
7	Explain the detection of hydrocarbon pollutant 1-hydroxy pyrene using Electrochemical sensor with electro-oxidation reactions.	L2	7
8	Discuss the working principle of electrochemical gas sensors for the detection of SO <sub>x</sub> and NO <sub>x</sub> .	L3	6
9	What are disposable sensors? Mention the advantages of disposable sensors.	L1	6
10	Discuss the detection of a bio-molecule ascorbic acid using disposable sensor also write the electro oxidation reaction.	L2	7
11	Explain the detection of Herbicide-Glyphosate with reactions.	L2	6
12	Define a battery. Give the classification of batteries with examples.	L1	6
13	What is a secondary battery? Explain the construction and working of Li-Ion battery.	L2	7

14	What is a secondary battery? Explain the construction and working of Na-Ion battery.	L2	7
15	What is Quantum Dot Sensitized Solar Cell (QDSSC)? Explain the construction and working of QDSSC.	L2	7
16	Write the properties and applications of Quantum Dot Sensitized Solar Cell (QDSSC).	L1	6
<b>MODULE-2 Materials for Memory and Display Systems</b>			
1	What are Memory Devices? Explain the Classification of electronic memory devices with examples	L2	6
2	Explain the types of organic memory devices by taking p- type and n-type semiconducting materials.	L2	7
3	Define photoactive and electroactive materials and write their working principle in display system.	L2	7
4	What are nanomaterials? Explain any four properties and applications of Polythiophenes (P3HT) suitable for optoelectronic devices.	L2	7
5	What is QLED? Mention any four properties and applications of QLED.	L1	6
6	Explain the classification of liquid crystals. Mention any four properties and applications of liquid crystals.	L2	6
7	Discuss the working of Liquid Crystal Display.	L2	7
8	Explain any four properties and applications of Light emitting materials - Poly[9-vinylcarbazole] (PVK)] suitable for optoelectronic devices.	L2	7
9	Discuss the use of Polyimide Polymeric material for Organic memory device.	L2	7
10	Define Optoelectronic device. Explain the working principle of Optoelectronic device.	L2	6
11	Write the properties and applications of Silicon Nano Crystals for Optoelectronic devices	L2	6
12	What is OLED? Mention any four properties and applications of OLED.	L1	6
<b>MODULE3:Corrosion and Electrode System</b>			
1	Define metallic corrosion. Describe the electrochemical theory of corrosion taking iron as an example.	L2	6
2	Discuss the following types of Corrosion: a. Differential Metal Corrosion b. Differential aeration Corrosion	L2	6
3	What is cathodic protection? Describe sacrificial anode technique and mention the advantages and disadvantages.	L3	7



4	Define galvanizing. Describe galvanizing of Iron and mention its applications.	L2	7
5	What is anodizing of aluminium? Describe anodizing of Aluminium and mention its applications.	L2	6
6	What is CPR? A thick brass sheet of area 400 inch <sup>2</sup> is exposed to moist air. After 2 years of period, it was found to experience a weight loss 375 g due to corrosion. If the density of brass is 8.73 g/cm <sup>3</sup> . Calculate CPR in mpy and mmpy.	L2	6
7	What are concentration cell? Explain the construction and working of concentration cell.	L2	6
8	What are reference electrodes? Explain the construction, working and application of Calomel electrode.	L2	7
9	Explain the construction and working of ion selective electrode and how it can be used for the determination of pH of a solution.	L2	7
10	Define concentration cell. Emf of the cell Ag/AgNO <sub>3</sub> (0.001M) // AgNO <sub>3</sub> (xM) /Ag is 0.0659 V at 298K. Write the cell representation, cell reactions and calculate the value of x.	L2	7
11	Briefly explain the principle, instrumentation and working of potentiometry taking estimation of Iron as example.	L2	6
12	Explain the principle, instrumentation and working of conductometry taking estimation of weak acid using a strong base as an example.	L2	6

#### MODULE 4: Polymers and Green Fuels

1	Define number average and weight average molecular weight. A polydisperse sample of polystyrene is prepared by mixing three monodisperse samples in the following proportions. 1g of 10000 molecular weight, 2g of 50000 molecular weight and 2g of 100000 molecular weight. Determine number average and weight average molecular weight. Find the index of polydispersity.	L2	7
2	Discuss the conduction mechanism in Polyacetylene through oxidative and reductive doping technique.	L3	7
3	Explain the preparation, properties, and commercial applications of graphene oxide.	L2	7
4	Explain the preparation, properties, and commercial applications of Kevlar.		7
5	Explain the construction and working of photovoltaic cells. Mention the advantages and disadvantages.	L2	7
5	What is Green Fuel (Hydrogen fuel)? Mention the advantages of green fuel.	L1	6

6	Describe the generation of hydrogen by Alkaline water electrolysis with a neat labelled diagram.	L2	6
7	Explain the generation of hydrogen by proton exchange membrane electrolysis.	L2	6
8	In a sample of a polymer, 20% molecules have molecular mass 15000 g/mol, 35% molecules have molecular mass 25000 g/mol, and remaining molecules have molecular mass 20000 g/mol, calculate the number average and weight average molecular mass of the polymer, Calculate PDI and comment on it.	L2	6
9	Illustrate with a neat labelled diagram the production of Hydrogen by using solid oxide electrolyzer.	L2	6
<b>MODULE 5: E-Waste Management</b>			
1	Define E-Waste. Explain the sources and composition of e-waste.	L2	6
2	Mention the sources of e-waste and explain the need for e-waste management	L2	7
3	Briefly discuss the various steps involved in recycling of e-waste. (all the three STEPS)	L3	7
4	Explain the steps involved in extraction of gold from e-waste.	L2	7
5	Explain the ill effects of toxic materials used in manufacturing electrical and electronic products.	L2	6
6	Discuss the following: (i) Pyrometallurgy (ii) Hydrometallurgy	L2	7
7	Write a brief note on role of stakeholders for example; producers, consumers, recyclers, and statutory bodies.	L3	6
8	What is e-waste? Explain the characteristics of E-Waste.	L2	6
9	Briefly explain direct recycling of e-waste.	L2	6

*D. R. Suman*

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**CITY ENGINEERING COLLEGE**  
**DEPT. OF CHEMISTRY**  
**1<sup>st</sup> ASSIGNMENT QUESTIONS**

1. Define reference electrode? Explain construction and working of Calomel electrode?
2. Define Ion selective electrode? Explain construction and working of glass electrode?
3. Explain determination of PH using glass electrode?
4. Explain construction and working of concentration cell?
5. Explain number average and weight average molecular weight?
6. Explain synthesis and conduction mechanism of polyacetylene?
7. Explain synthesis and properties of Kevlar?
8. Explain preparation, properties and commercial applications of graphene oxide?
9. Explain electrochemical theory of corrosion?
10. Explain differential metal and differential aeration corrosion?
11. Explain galvanization?
12. Write a note on anodization?
13. Write a note on sacrificial anode method?

**CITY ENGINEERING COLLEGE**  
**DEPT. OF CHEMISTRY**  
**2<sup>nd</sup> ASSIGNMENT QUESTIONS**

1. Explain principle and instrumentation of conductometry?
2. Explain conductometric estimation of weak acid?
3. Explain principle, construction & instrumentation of potentiometry?
4. Explain potentiometric estimation of Iron?
5. Explain construction working of solar photovoltaic cell?
6. Write any 3 advantages and disadvantages of solar cell?
7. Explain generation of H<sub>2</sub> by alkaline water electrolysis and its advantages?
8. Explain generation of H<sub>2</sub> by proton exchange membrane electrolysis?
9. Explain principle and application of conductometric sensor?
10. Explain working, principle of electrochemical sensor?
11. Explain working, principle of optical sensor?
12. Explain measurement of dissolved oxygen by electrochemical sensor?
13. Explain detection of biomolecule of ascorbic acid using sensor?
14. Explain detection of pesticide glyphosate using sensor?
15. Explain principle, properties of quantum dot sensitized solar cell?
16. Explain detection of pharmaceutical drug diclofenac using sensor?

# Model Question Paper-1 with effect from 2021 (CBCS Scheme)

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## First Semester Engineering Degree Examination Subject Title 21CHE12/22

TIME: 03 Hours

Max. Marks: 100

Note: Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**.

MODULE 1			Marks
Q.1	a	Define Single Electrode Potential. Derive Nernst equation for single electrode potential.	7
	b	Describe the construction and working of calomel electrode	6
	c	Explain the construction and working of Li-ion battery, mention its applications.	7
<b>OR</b>			
Q.2	a	Distinguish between primary, secondary and reserve batteries.	6
	b	Explain construction and working of glass electrode.	7
	c	For the cell, Fe/Fe <sup>2+</sup> (0.01M)//Ag <sup>+</sup> (0.1M)/Ag write the cell reaction and calculate the emf of the cell at 298K, if standard electrode potentials of Fe and Ag electrodes are -0.44V and 0.8 V respectively.	7
<b>MODULE 2</b>			
Q.3	a	Define metallic corrosion? Describe the electrochemical theory of corrosion taking iron as an example.	7
	b	Explain: (i) Differential metal corrosion & (ii) Water-line corrosion	6
	c	What is electroplating? Explain the electroplating of chromium	7
<b>OR</b>			
Q.4	a	What is meant by metal finishing? Mention (any five) technological importance of metal finishing.	6
	b	What is electroless plating? Explain the electroless plating of copper.	7
	c	Explain the factors affecting the rate of corrosion (i) Nature of corrosion product, (ii) Ratio of anodic to cathodic areas & (iii) pH	7
<b>MODULE 3</b>			
Q.5	a	Explain the synthesis and application of Polyurethane.	7
	b	Describe the mechanism of conduction in Polyaniline and factors influencing conduction in organic polymers.	7
	c	Explain any two size dependent properties of nanomaterials	6
<b>OR</b>			
Q.6	a	What are nanomaterials? Explain the synthesis of nanomaterial by sol gel process.	7
	b	Write a note on Fullerenes. Mention its applications.	6
	c	Explain the synthesis, properties and application of Polylactic acid.	7

<b>MODULE 4</b>			
Q.7	a	With suitable example explain microwave synthesis and bio catalyzed reactions	7
	b	Explain the synthesis of Adipic acid by conventional route from Benzene and green route from Glucose.	7
	c	Describe the construction and working of Methanol –Oxygen fuel cell.	6
<b>OR</b>			
Q.8	a	Describe the hydrogen production by photo catalytic water splitting method.	7
	b	Explain the synthesis of Paracetamol by conventional and green route from phenol.	7
	c	Explain the construction and working of photovoltaic cells.	6
<b>MODULE 5</b>			
Q.9	a	Explain the theory, instrumentation and applications of flame photometry.	7
	b	Write the principles and requirement of titrimetric analysis.	7
	c	In a COD test, 30.5 cm <sup>3</sup> and 15.5 cm <sup>3</sup> of 0.05 N FAS solutions are required for blank & sample titration respectively. The volume of test sample used was 25 cm <sup>3</sup> . Calculate the COD of the sample solution.	6
<b>OR</b>			
Q.10	a	Explain the determination of hardness of water by EDTA method.	7
	b	Define the following units of standard solution. i) Molarity ii) Normality iii) ppm	6
	c	Explain the theory and instrumentation of potentiometry.	7

Table showing the Bloom's Taxonomy Level, Course Outcome and Program Outcome				
Question		Bloom's Taxonomy Level attached	Course Outcome	Program Outcome
Q.1	(a)	L1, L2	CO.1	PO-1,2,12
	(b)	L2	CO.1	PO-1,2,12
	(c)	L2	CO.1	PO-1,2,12
Q.2	(a)	L1	CO.1	PO-1,2,12
	(b)	L2	CO.1	PO1,2,12
	(c)	L3	CO.I	PO-1
Q.3	(a)	L2	CO.2	PO-1,2,12
	(b)	L2	CO.2	PO-1,2,12
	(c)	L2	CO.2	PO-1,2,12
Q.4	(a)	L1	CO.2	PO-1,2,12
	(b)	L2	CO.2	PO1
	(c)	L2	CO.2	PO-1,2,12
Q.5	(a)	L2	CO.3	PO-1,2,12
	(b)	L2	CO.3	PO-1,2,12
	(c)	L2	CO.3	PO-1,2,12
Q.6	(a)	L2	CO.3	PO1,2,12
	(b)	L2	CO.3	PO-1,2,12
	(c)	L2	CO.3	PO-1,2,12
Q.7	(a)	L2	CO.4	PO-1,2,12
	(b)	L2	CO.4	PO-1,2,12
	(c)	L2	CO.4	PO-1,2,12
Q.8	(a)	L2	CO.4	PO-1,2,12
	(b)	L2	CO.4	PO-1,2,12
	(c)	L2	CO.4	PO-1,2,12
Q.9	(a)	L2	CO.5	PO-1,2,12
	(b)	L2	CO.5	PO-1,2,12
	(c)	L3	CO.5	PO-1
Q.10	(a)	L2	CO.5	PO-1,2,12
	(b)	L2	CO.5	PO-1,2,12
	(c)	L2	CO.5	PO-1,2,12
<b>Lower order thinking skills</b>				
<b>Bloom's Taxonomy Levels</b>	Remembering( knowledge): <i>L</i> <sub>1</sub>		Understanding (Comprehension): <i>L</i> <sub>2</sub>	Applying (Application): <i>L</i> <sub>3</sub>
	<b>Higher order thinking skills</b>			
	Analyzing (Analysis): <i>L</i> <sub>4</sub>	Valuating (Evaluation): <i>L</i> <sub>5</sub>	Creating (Synthesis): <i>L</i> <sub>6</sub>	

## Model Question Paper-2 with effect from 2021 (CBCS Scheme)

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### First Semester Engineering Degree Examination Subject Title 21CHE12/22

TIME: 03 Hours

Max. Marks: 100

Note: Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**.

MODULE 1			Marks
Q.1	a	Define Single Electrode Potential. Obtain the expression for single electrode potential.	7
	b	What are ions Selective Electrodes? Explain construction and working of glass electrode	7
	c	Write briefly the recycling of Li-ion battery by direct recycling method	6
<b>OR</b>			
Q.2	a	Explain the construction, working and applications of Li-ion batteries.	6
	b	Explain the experimental determination of $P^H$ using glass	7
	c	Calculate the single electrode potential of Cu electrode at 27°C when the standard potential of Cu is 0.34V and $[Cu^{2+}]$ 0.1M	7
<b>OR</b>			
Q.3	a	Explain the following factors which affecting the rate of corrosion i) Ratio of anodic and cathodic areas ii) nature of corrosion product	7
	b	What is anodizing? Explain the process of anodizing of Al	6
	c	What is electroless plating? Distinguish between electro and electroless plating.	7
<b>OR</b>			
Q.4	a	What is meant by metal finishing? Mention (any five) technological importance of metal finishing.	6
	b	A thick steel sheet of area 400 cm <sup>2</sup> is exposed to air near the ocean. After a one year period it was found to experience a weight loss 375 g due to corrosion. If the density of the brass is 7.9g/cm <sup>2</sup> calculate the corrosion penetrating rate in mpy and mm/y ( given K= 534 in mpy and 87.6 in mm/y)	7
	c	What is cathodic protection? Explain sacrificial anode and impressed voltage methods of cathodic protection	7
<b>MODULE 3</b>			
Q.5	a	What are polymer composites? Explain the synthesis and application of Kevlar fibre	7
	b	What are conducting polymers? Explain the various factors influencing the conduction in organic polymers.	7
	c	Briefly explain the carbon nanotubes with properties and applications.	6



<b>OR</b>			
Q.6	a	Explain optical and electrical properties of nanomaterials.	7
	b	What are nanomaterials? Explain the synthesis of nanomaterials by precipitation method	6
	c	What are Biodegradable polymers? Explain the properties and applications of Polylactic acid.	7
<b>MODULE 4</b>			
Q.7	a	Briefly explain any six basic principles of green chemistry.	6
	b	Explain the following i) Phase transfer catalyst ii) Solvent free reaction	7
	c	With a neat diagram explain the production of Hydrogen by Photocatalytic method	7
<b>OR</b>			
Q.8	a	Describe the hydrogen production by photo electrocatalytic method.	7
	b	Explain the synthesis of Paracetamol by conventional and green route from phenol.	7
	c	Explain the construction and working of photovoltaic cells.	6
<b>MODULE 5</b>			
Q.9	a	Explain the theory, instrumentation and applications of flame photometry.	7
	b	Write the principles and requirement of titrimetric analysis.	7
	c	In a COD test, 30.5 cm <sup>3</sup> and 15.5 cm <sup>3</sup> of 0.05 N FAS solutions were consumed for blank & sample titration respectively. The volume of test sample used was 25 cm <sup>3</sup> . Calculate the COD of the sample solution.	6
<b>OR</b>			
Q.10	a	Explain the determination of hardness by EDTA method.	7
	b	Define the following units of standard solution. i) Molarity ii) Normality iii) ppm	6
	c	Explain the theory and instrumentation of potentiometry.	7

Table showing the Bloom's Taxonomy Level, Course Outcome and Program Outcome				
Question		Bloom's Taxonomy Level attached	Course Outcome	Program Outcome
Q.1	(a)	L1, L2	CO.1	PO-1,2,12
	(b)	L2	CO.1	PO-1,2,12
	(c)	L2	CO.1	PO-1,2,12
Q.2	(a)	L1	CO.1	PO-1,2,12
	(b)	L2	CO.1	PO1,2,12
	(c)	L3	CO.I	PO-1
Q.3	(a)	L2	CO.2	PO-1,2,12
	(b)	L2	CO.2	PO-1,2,12
	(c)	L2	CO.2	PO-1,2,12
Q.4	(a)	L1	CO.2	PO-1,2,12
	(b)	L2	CO.2	PO1
	(c)	L2	CO.2	PO-1,2,12
Q.5	(a)	L2	CO.3	PO-1,2,12
	(b)	L2	CO.3	PO-1,2,12
	(c)	L2	CO.3	PO-1,2,12
Q.6	(a)	L2	CO.3	PO1,2,12
	(b)	L2	CO.3	PO-1,2,12
	(c)	L2	CO.3	PO-1,2,12
Q.7	(a)	L2	CO.4	PO-1,2,12
	(b)	L2	CO.4	PO-1,2,12
	(c)	L2	CO.4	PO-1,2,12
Q.8	(a)	L2	CO.4	PO-1,2,12
	(b)	L2	CO.4	PO-1,2,12
	(c)	L2	CO.4	PO-1,2,12
Q.9	(a)	L2	CO.5	PO-1,2,12
	(b)	L2	CO.5	PO-1,2,12
	(c)	L3	CO.5	PO-1
Q.10	(a)	L2	CO.5	PO-1,2,12
	(b)	L2	CO.5	PO-1,2,12
	(c)	L2	CO.5	PO-1,2,12
<b>Lower order thinking skills</b>				
<b>Bloom's Taxonomy Levels</b>	Remembering( knowledge): <i>L</i> <sub>1</sub>		Understanding Comprehension): <i>L</i> <sub>2</sub>	Applying (Application): <i>L</i> <sub>3</sub>
	<b>Higher order thinking skills</b>			
	Analyzing (Analysis): <i>L</i> <sub>4</sub>	Valuating (Evaluation): <i>L</i> <sub>5</sub>	Creating (Synthesis): <i>L</i> <sub>6</sub>	

## CBCS SCHEME

USN

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BCHEE102

**First Semester B.E./B.Tech. Degree Examination, Jan./Feb. 2023**  
**Chemistry for EEE Stream**

Time: 3 hrs.

Max. Marks: 100

- Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.  
 2. VTU Formula Hand Book is permitted.  
 3. M : Marks , L: Bloom's level , C: Course outcomes.*

Module – 1			M	L	C
Q.1	a.	Explain the classification of materials as conductors, insulators and semiconductors along with a suitable example with the help of band theory.	7	L2	CO1
	b.	Define the following with respect to polymers : i) Conducting polymers ii) Number average molecular weight iii) Weight average molecular weight.	6	L1	CO1
	c.	Describe eletroless plating of copper with bath composition and reaction in the manufacture of double-sided printed circuit board (PCB).	7	L2	CO1
OR					
Q.2	a.	Discuss the production of electronic grade silicon by Czochralski(CZ) process.	6	L2	CO1
	b.	What are Polymers? In a sample of a polymer, 100 molecular have molecular mass $10^3$ g/mol, 200 molecular have molecular mass $10^4$ g/mol and 250 molecular have molecular mass $10^5$ g/mol. Calculate number average macular mass weight average molecular mass and polydisperisty index.	7	L3	CO1
	c.	What is grapheme? Describe the preparation and properties of graphene oxide.	7	L2	CO1
Module – 2					
Q.3	a.	What are batteries? Explain the construction with a diagram and working of sodium-ion battery.	7	L2	CO2
	b.	What are fuel cells? Explain the construction with a diagram and working of methanol- oxygen fuel cell.	7	L2	CO2
	c.	List out a minimum three advantages and disadvantages of solar photovoltaic cells.	6	L1	CO2

OR				
Q.4	a.	Describe the construction, and working of Vanadium redox flow battery. Mention its applications.	7	L2 CO2
	b.	Explain the construction, working and applications of Polymer Electrolyte Membrane (PEM) fuel cell.	7	L2 CO2
	c.	Discuss the construction and working of photovoltaic cell.	6	L2 CO2
Module – 3				
Q.5	a.	What is corrosion? Explain the electrochemical theory of corrosion taking iron as an example.	7	L2 CO3
	b.	Define corrosion penetration rate (CPR). Calculate the CPR in both mpy and mmpy for steel sheet of area 150 inch <sup>2</sup> which experienced a weight loss of 490g after one year. Given density of steel = 7.9g/cc.	6	L3 CO3
	c.	Discuss sources, types and effects of e-waste on environment and human health.	7	L2 CO3
OR				
Q.6	a.	Demonstrate the type of corrosion taking place in the following cases : i) A steel screw in copper sheet for a long time ii) Partially buried pipeline in soil.	6	L3 CO3
	b.	What is e-waste? Explain the methods of e-waste disposal.	7	L2 CO3
	c.	Describe the extraction of copper from e-work. Mention any two advantages of recycling.	7	L2 CO3
Module – 4				
Q.7	a.	What are nanomaterials? Explain the following size dependent properties of nanomaterials : i) Surface area ii) Catalytic property iii) Conducting property.	7	L2 CO4
	b.	Describe the synthesis of nanomaterials by sol – gel method with a suitable example.	6	L2 CO4
	c.	What are liquid crystals? Explain the classification, properties and applications of liquid crystals in display systems.	7	L2 CO4
OR				
Q.8	a.	Explain the properties and applications of nanofibers and nanosensors.	6	L2 CO4
	b.	Mention the properties and applications of : i) Organic Light Emitting Diode (OLED) ii) Quantum Light Emitting Diode (QLED).	7	L2 CO4
	c.	What are perovskite materials? Give the properties and applications of perovskite materials in optoelectronic devices.	7	L2 CO4

## Module – 5

Q.9	a.	What is reference electrode? Describe the construction and working of calomel electrode.	7	L2	CO5
	b.	What are concentration cells? Explain the construction and working of electrolyte concentration cell with a suitable example.	6	L2	CO5
	c.	What are optical sensors? Explain the principle and instrumentation of colorimetric sensor.	7	L2	CO5
<b>OR</b>					
Q.10	a.	What are ion-selective electrode? Discuss the construction and working of glass electrode.	7	L2	CO5
	b.	What are potentiometric sensors? Explain working principle instrumentation and applications of potentiometric sensor.	7	L2	CO5
	c.	A concentration cell is constructed by combining two lithium electrodes immersed in lithium sulphate solution of concentration 0.1m and 0.1m at 298K. Write the cell representation, cell reaction and calculate the EMF of the cell.	6	L3	CO5

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## Department of Chemistry I Semester

Sub: Applied Chemistry for CS Stream

Max marks:25M

Sub code: BCHES102

Duration:1 hour (10.30-11.30)

Date: 16/11/2023

## First Internal Test

Q.No.	Questions	Marks	CO's	L
Part-A				
1.	Explain electrochemical theory of corrosion?	5	CO3	L2
OR				
2.	Explain Differential aeration corrosion with any one example?	5	CO3	L2
PART-B				
3.	Explain principle of cathodic protection with any one example?	5	CO3	L2
OR				
4.	Write a note on galvanization ?	5	CO3	L2
PART-C				
5.	A thick sheet of area $300 \text{ cm}^2$ is exposed to air near ocean. After one year period it was found to experience a weight loss of 250g due to corrosion. Calculate the rate of corrosion in both mpy and mmpy. ( Density of steel $7.9 \text{ g/cm}^3$ ).	5	CO3	L2
OR				
6.	A concentration cell was constructed by immersing two copper electrodes in 0.1M and 1.0M $\text{CuSO}_4$ solution. Write cell representation and cell reactions and calculate the EMF.	5	CO3	L2
PART-D				
7.	Define conducting polymers and explain conduction mechanism in polyacetylene?	5	CO4	L1
OR				
8.	Explain construction and working of glass electrode?	5	CO3	L2

P.T.O

## PART-E

9.	A polymer sample contains 1,2,3 and 4 molecules having molecular weight $1 \times 10^5$ , $2 \times 10^5$ , $3 \times 10^5$ and $4 \times 10^5$ . Calculate number average and weight average molecular weight.	5	CO4	L1
----	---	---	-----	----

OR

10.	Define reference electrode? Explain construction and working of calomel electrode?	5	CO3	L2
-----	--	---	-----	----

CO3---Solve the problems in chemistry that are pertinent in engineering applications.

CO4--- Apply the basic concepts of chemistry to explain the chemical properties and processes.

L1---Remembering, L2---Understanding

CITY ENGINEERING COLLEGE  
DEPARTMENT OF Chemistry

SCHEME FOR VALUATION

Internal Test I

Semester & Section: I, D, E, F

Date: 16/11/23

Question No.	Details of the answer	Marks Distribution	Total Marks
1.	<p>Expt. + reactions.</p> <p>Anode: <math>Fe \rightarrow Fe^{2+} + 2e^{-}</math></p> <p>Cathode:</p> <p>Aerated &amp; neutral, <math>O_2 + 2H_2O + 4e^{-} \rightarrow 4OH^{-}</math></p> <p>Deaerated &amp; neutral, <math>2H_2O + 2e^{-} \rightarrow 2H_2 + 2OH^{-}</math></p> <p>Deaerated &amp; acidic; <math>2H^{+} + 2e^{-} \rightarrow H_2</math></p>	2+3	5M
2.	<p>Expt. + reactions.</p> <p>Anode: <math>Fe \rightarrow Fe^{2+} + 2e^{-}</math></p> <p>Cathode: <math>O_2 + 2H_2O + 4e^{-} \rightarrow 2OH^{-}</math></p>	3+2	5M
3.	Def. + Example + fig.	1+3+1	5M
4.	Def. + Fig. + Expt.	1+1+3	5M
5.	<p><math>CPR = \frac{KW}{P \times A \times L}</math></p> <p><math>= \frac{534 \times 250 \times 1000 \times 6.45}{7.9 \times 307 \times 365 \times 24}</math></p> <p><math>= 41.475 \text{ mpy.}</math></p> <p><math>CPR \text{ mm/yr} = \frac{87.6 \times 250 \times 1000}{7.9 \times 307 \times 265 \times 24}</math></p> <p><math>= 1.05 \text{ mm/yr}</math></p>	1M 1M 1M 1M	5M

Staff

MOD



CITY ENGINEERING COLLEGE

DEPARTMENT OF .....

SCHEME FOR VALUATION

Internal Test .....

Semester & Section:

Date:

Question No.	Details of the answer	Marks Distribution	Total Marks
6.	$E = \frac{2.303 RT}{nF} \log \left( \frac{C_2}{C_1} \right)$ $= \frac{2.303 \times 8.314 \times 298}{2 \times 96500} \log \left( \frac{1.0}{0.1} \right)$ $E = 0.0295V$ <p>cell rep. + cell reactions</p>	3M  2M	5M
7.	Def. + Expl. + fig.	1+2+2	5M
8.	<p>construction + working</p> $E_b = \frac{RT}{F} \ln C_2 - \frac{RT}{F} \ln C_1$ $= -\frac{RT}{F} \ln C_1 + \frac{RT}{F} \ln C_2$ $E_b = L - 0.0591 pH$ $E_{c_2} = L_1 - 0.0591 pH$	1+3  4M	5M
9.	$\bar{M}_n = \frac{N_1 M_1 + N_2 M_2 + N_3 M_3 + N_4 M_4}{N_1 + N_2 + N_3 + N_4}$ $= \frac{1 \times 10^5 + (2 \times 2 \times 10^5) + (3 \times 3 \times 10^5) + 4(4 \times 10^5)}{1 + 2 + 3 + 4}$	2M	5M

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$$= 3 \times 10^5$$

100

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SCHEME FOR VALUATION

Internal Test .....

Semester & Section:

Date:

Question No.	Details of the answer	Marks Distribution	Total Marks
10	$\bar{M}_w = \frac{N_1 M_1^2 + N_2 M_2^2 + N_3 M_3^2 + N_4 M_4^2}{N_1 M_1 + N_2 M_2 + N_3 M_3 + N_4 M_4}$ $= \frac{(10^5)^2 + 2 \times (2 \times 10^5)^2 + 3 \times (3 \times 10^5)^2 + 4 \times (4 \times 10^5)^2}{300000} \text{ 3M.}$ $= 3.3 \times 10^5$ <p>Def: + fig. + Reaction + Expl.</p>	1+1+2+1	5M

Staff

FIOD

  
 PRINCIPAL  
 CITY ENGINEERING COLLEGE  
 Kanakapura Main Road, BANGALORE - 560 061


**Department of Chemistry I Semester**
**Sub:** Applied Chemistry for CS Stream **Max. marks:** 25M

**Sub code:** BCHES102 **Duration:** 1 hour (10.30-11.30)

**Date:** 04/01/2024

*KS*
**SECOND INTERNAL TEST**
**Note:- Answer five questions, choosing one from each part.**

Q.No.	Questions	Marks	CO's	L
<b>Part-A</b>				
1.	Explain construction & working of solar (photovoltaic) cell?	5	CO4	L3
OR				
2.	Explain application in Liquid crystal display (LCD)?	5	CO2	L1
<b>PART-B</b>				
3.	Explain generation of H <sub>2</sub> by alkaline water electrolysis with advantages?	5	CO4	L2
OR				
4.	Explain generation of H <sub>2</sub> by proton exchange membrane electrolysis (PEM)?	5	CO4	L2
<b>PART-C</b>				
5.	Explain principle of quantum dot sensitized solar cell (QDSSC)?	5	CO1	L3
OR				
6.	Explain detection of ascorbic acid using disposable sensor?	5	CO1	L2
<b>PART-D</b>				
7.	Explain working principle of electrochemical sensor?	5	CO1	L2
OR				
8.	Explain organic material P3HT as optoelectronic device?	5	CO2	L1
<b>PART-E</b>				
9.	Explain construction and working of Na-ion battery?	5	CO1	L3
OR				
10.	Explain construction and working of Li-ion battery?	5	CO1	L3

CO1---Identify the term processes involved in scientific and engineering applications.

CO2---Explain the phenomena of chemistry to describe the methods of engineering processes.

CO4--- Apply the basic concepts of chemistry to explain the chemical properties and processes.

L1-Remembering L2- Understanding L3-Applying.

## CITY ENGINEERING COLLEGE

DEPARTMENT OF Chemistry

2022-23 . SCHEME FOR VALUATION

Internal Test IISemester & Section: I, D, E, F.Date: 4/01/24.

Question No.	Details of the answer	Marks Distribution	Total Marks
1.	Figure + Expl.	2+3	5M.
2.	Figure + Expl.	2+3	5M.
3.	Fig. + reactions + Expl. Anode: $2OH^- \rightarrow \frac{1}{2}O_2 + H_2O + 2e^-$ Cathode: $2H_2O + 2e^- \rightarrow H_2 + 2OH^-$	1+2+2	5M.
4.	Fig. + reactions + Expl. Anode: $H_2O \rightarrow \frac{1}{2}O_2 + 2H^+ + 2e^-$ Cathode: $2H^+ + 2e^- \rightarrow H_2$	1+2+2	5M.
5.	Mech. + Fig.	3+2	5M.
6.	Fig. + reactions + Expl.	1+1+3	5M.
7.	components of electrochemical sensors + Fig. + Applc.	2+1+2	5M.


  
Staff


  
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CITY ENGINEERING COLLEGE

DEPARTMENT OF .....

SCHEME FOR VALUATION

Internal Test .....

Semester & Section:

Date:

Question No.	Details of the answer	Marks Distribution	Total Marks
8.	Structure + properties + Appl.	1+2+2	5M
9.	<p>Anode: <math>C-Na \xrightleftharpoons[\text{Recharge}]{\text{Discharge}} C + Na^+ + 1e^-</math></p> <p>Cathode: <math>Na^+ + 1e^- + CO_2 \xrightleftharpoons[\text{R.}]{\text{P.}} NaCO_2</math></p> <hr/> <p><math>C-Na + CO_2 \xrightleftharpoons[\text{R.}]{\text{P.}} NaCO_2 + C</math></p> <p>Fig. + Reactions + Expl.</p>	1+2+2	5M.
10.	<p>Fig. + Reactions + Expl.</p> <p>Anode: <math>Li-C_6 \xrightleftharpoons[\text{R.}]{\text{D}} Li^+ + 6C + 1e^-</math></p> <p>Cathode: <math>Li^+ + 1e^- + CO_2 \xrightleftharpoons[\text{R.}]{\text{D}} LiCO_2</math></p> <hr/> <p><math>Li-C_6 + CO_2 \xrightleftharpoons[\text{R.}]{\text{P.}} LiCO_2 + 6C</math></p>	1+2+2	5M.

Staff

ROD

2022 - Scheme

Year : 2023 - 2024

Semester : Odd / Even ✓

Name of the Teacher : Dr. Suniltra. N.

Designation : Assoc. prof.

Department : Chemistry

Sem/Branch	Subject Code	Subject
1. <u>I   CSE</u>	<u>BCHES102</u>	<u>Applied Chemistry</u>
2. _____	_____	<u>for CSE stream.</u>
3. _____	_____	_____

	Initials at the End of the			
	1st Month	2nd Month	3rd Month	Semester
Staff	<u>SN</u>	<u>SN</u>	<u>SN</u>	<u>SN</u>
HOD	<u>SN</u>	<u>SN</u>	<u>SN</u>	<u>SN</u>
Principal				

Sl. No.	Reg. No.	Name	28	3	4	6	11	12	16	20	25	27	2
			9	10	10	10	10	10	10	10	10	10	10
			1	2	3	4	5	6	7	8	9	10	11
1	ICE23CS003	Adithya. K. M	1	2	3	4	5	6	7	8	9	10	11
2	05	Afran Pasha.	1	2	3	4	5	6	7	8	9	10	11
3	F-07	Akash. C. P	1	2	3	4	5	6	7	8	9	10	11
4	13 F-08	Akash. J. Gowda. (005)	1	2	3	4	5	6	7	8	9	10	11
5	09	Akashraj. V. T	1	2	3	4	5	6	7	8	9	10	11
6	14 F-11	Amaz Narayana. N. C	1	2	3	4	5	6	7	8	9	10	11
7	12	Anagha. N	1	2	3	4	5	6	7	8	9	10	11
8	13	Aniltra. K	1	2	3	4	5	6	7	8	9	10	11
9	14	Anjan. P	1	2	3	4	5	6	7	8	9	10	11
10	15	Anpiltra	1	2	3	4	5	6	7	8	9	10	11
11	16	Anusha. A	1	2	3	4	5	6	7	8	9	10	11
12	17	Aryan Tiwari	1	2	3	4	5	6	7	8	9	10	11
13	18	Asha. P	1	2	3	4	5	6	7	8	9	10	11
14	19	Ashutosh. B. Cherekas.	1	2	3	4	5	6	7	8	9	10	11
15	20	Ayush upadhya	1	2	3	4	5	6	7	8	9	10	11
16	21	Bhavan	1	2	3	4	5	6	7	8	9	10	11
17	22	Bhavana. N. S (019)	1	2	3	4	5	6	7	8	9	10	11
18	14 F 23	Bhousmi	1	2	3	4	5	6	7	8	9	10	11
19	24.	Bhoomika. P	1	2	3	4	5	6	7	8	9	10	11
20	25	Bhumika Balaganus.	1	2	3	4	5	6	7	8	9	10	11
21	27	Bindushree. K. M	1	2	3	4	5	6	7	8	9	10	11
22	28	C. H. Harikishan Reddy.	1	2	3	4	5	6	7	8	9	10	11
23	29	Chandan. D. R	1	2	3	4	5	6	7	8	9	10	11
24	30	Chandana. V	1	2	3	4	5	6	7	8	9	10	11
25	F 31	Chandranakanti. V	1	2	3	4	5	6	7	8	9	10	11
	No. of Absents												
	Initials												





71%

110%

69

20tail  
49 pass

## ATTENDANCE

Sl. No.	Reg. No.	Name
1	ICE23CS003	Aditya. K. M
2	-05	Afraz Pasha.
3	F-07	Akash. C. P
4	13 F-08	Akash. J. Gowda. (005)
5	-09	Akashraj. V. T
6	14 F-11	Amaz Narayana. N. C
7	-12	Anagha. N
8	-13	Anilra. K
9	-14	Anjan. P
10	-15	Ankitha
11	-16	Anusha. A
12	-17	Aryan Tiwari
13	+18	Asha. P
14	-19	Ashutosh. B. Cherekas.
15	20	Ayushi upadhyay
16	21	Bhavan
17	22	Bhavana. N. S. (019)
18	14 F 23	Bhavani
19	24.	Bhoomika. P
20	25	Bhumika Balaganur.
21	27	Bindushree. K. M
22	28	C. H. Harikrishan Reddy.
23	29	Chandan. D. R
24	30	Chandana. V
25	F 31	Chandrakanth. V
No. of Absents		
Initials		

1	4	6	8	9	11	12	12	18
10	12	12	12	12	12	12	12	12
22	23	24	25	26	27	28	29	30
22	23	24	25	26	27	28	29	29
22	23	24	25	26	27	28	29	30
20	21	22	23	24	25	26	27	28
20	21	22	23	24	25	26	27	28
20	20	21	22	23	24	25	26	27
19	20	21	22	23	24	25	26	27
21	22	23	24	25	26	27	28	29
21	22	23	24	25	26	27	28	29
21	22	23	24	25	26	27	28	29
21	22	23	24	25	26	27	28	29
22	23	24	25	26	27	28	29	30
22	22	23	24	25	26	27	28	29
20	21	22	23	24	25	26	27	28
22	23	24	25	26	27	28	29	30
21	22	23	24	25	26	27	28	29
20	21	22	23	24	25	26	27	28
21	22	23	24	25	26	27	28	29
21	22	23	24	25	26	27	28	29
22	23	24	25	26	27	28	29	30
20	21	22	23	24	25	26	27	28
21	22	23	24	25	26	27	28	29
21	22	23	24	25	26	27	28	29
22	23	24	25	26	27	28	29	30
22	23	24	25	26	27	28	29	30
20	21	22	23	24	25	26	27	28
21	22	23	24	25	26	27	28	29
21	22	23	24	25	26	27	28	29

# ASSESSMENT

15M  
Avg. IA

19	20	23	27	29	30	1	3	5	8
12	17	12	12	12	12	M	M	4	4
32	33	34	35	36	37	38	39	40	41
30	31	32	33	34	35	36	37	38	39
32	33	34	35	36	37	38	39	40	41
29	30	31	32	33	34	35	36	37	38
30	31	32	33	34	35	36	37	38	39
29	30	31	32	33	34	35	36	37	38
29	30	31	32	33	34	35	36	37	38
30	31	32	33	34	35	36	37	38	39
30	31	32	33	34	35	36	37	38	39
31	32	33	34	35	36	37	38	39	40
30	31	32	33	34	35	36	37	38	39
32	33	34	35	36	37	38	39	40	41
31	32	33	34	35	36	37	38	39	40
30	31	32	33	34	35	36	37	38	39
31	32	33	34	35	36	37	38	39	40
30	31	32	33	34	35	36	37	38	39
29	30	31	32	33	34	35	36	37	38
32	33	34	35	36	37	38	39	40	41
31	32	33	34	35	36	37	38	39	40
32	33	34	35	36	37	38	39	40	41
29	30	31	32	33	34	35	36	37	38
29	30	31	32	33	34	35	36	37	38

tn.	25M Test Marks					Sessional Marks	25M 25M 50M		
	IA1	IA2	Assg1	Assg2	Assg3		Remarks		
	1	2	3	4	5		Theory CIE	Practical CIE	Final CIE
	11	17	10	10	10	09	19 ✓	25	44 ✓
	25	25	10	10	10	15	25 ✓	25	50 ✓
	08	11	10	10	10	06	16 ✓	24	40 ✓
	14	20	10	10	10	11	21 ✓	25	46 ✓
	20	25	10	10	10	14	24 ✓	25	49 ✓
	06	11	10	10	10	06	16 ✓	25	41 ✓
	25	25	10	10	10	15	25 ✓	25	50 ✓
	24	21	10	10	10	14	24 ✓	25	49 ✓
	13	14	10	10	10	09	19 ✓	24	43 ✓
	20	17	10	10	10	12	22 ✓	25	47 ✓
	24	25	10	10	10	15	25 ✓	25	50 ✓
	25	25	10	10	10	15	25 ✓	25	50 ✓
	24	25	10	10	10	15	25 ✓	25	50 ✓
	25	25	10	10	10	15	25 ✓	25	50 ✓
	17	21	10	10	10	12	22 ✓	25	47 ✓
	15	16	10	10	10	10	20 ✓	25	45 ✓
	25	25	10	10	10	15	25 ✓	25	50 ✓
	16	20	10	10	10	11	21 ✓	25	46 ✓
	24	22	10	10	10	14	24 ✓	25	49 ✓
	19	11	10	10	10	09	19 ✓	25	44 ✓
	20	25	10	10	10	14	24 ✓	25	49 ✓
	19	22	10	10	10	13	23 ✓	24	47 ✓
	10	15	10	10	10	08	18 ✓	25	43 ✓
	18	18	10	10	10	11	21 ✓	25	46 ✓
	08	15	10	10	10	08	18 ✓	23	41 ✓

# ATTENDANCE

Sl. No.	Reg. No.	Name	23	3	4	6	11	12	16	20	25	27	
			9	10	10	10	10	10	10	10	10	10	
			1	2	3	4	5	6	7	8	9	10	11
26	33	Charitha. C	1	2	3	4	5	6	7	8	9	10	11
27	34	Chethan. B.N	1	2	3	4	5	6	7	8	9	10	11
28	35	Chethana. S.Y	1	2	3	4	5	6	7	8	9	10	11
29	36	Chinmayi. P.N	1	2	3	4	5	6	7	8	9	10	11
30	37	D.M. Manya	1	2	3	4	5	6	7	8	9	10	11
31	F 38	Dandoi Venkata Sai	1	2	3	4	5	6	7	8	9	10	11
32	F 39	Darsha. V	1	2	3	4	5	6	7	8	9	10	11
33	40	Darshan. B.S	1	2	3	4	5	6	7	8	9	10	11
34	40V	Darshan Gowda. M	1	2	3	4	5	6	7	8	9	10	11
Apply 35	M F 46	Deepika. S.J	1	2	3	4	5	6	7	8	9	10	11
36	48	Dinesh. C	1	2	3	4	5	6	7	8	9	10	11
37	49	Divya. S. Pune.	1	2	3	4	5	6	7	8	9	10	11
Apply 38	M F 51	Evans. J	1	2	3	4	5	6	7	8	9	10	11
39	53	F 03 Ahmed.	1	2	3	4	5	6	7	8	9	10	11
40	(97) 54	Gayana. D.C	1	2	3	4	5	6	7	8	9	10	11
41	F 55	Govinda Raju. S.N	1	2	3	4	5	6	7	8	9	10	11
42	56	Hari. R.	1	2	3	4	5	6	7	8	9	10	11
43	13 F 57	Harshitha. L	1	2	3	4	5	6	7	8	9	10	11
44	58	Harshitha. M	1	2	3	4	5	6	7	8	9	10	11
45	60	Hemanth. A.N	1	2	3	4	5	6	7	8	9	10	11
46	62	Indu	1	2	3	4	5	6	7	8	9	10	11
47	F 64	Jeevan. T	1	2	3	4	5	6	7	8	9	10	11
48	F 66	Kallesh. H.V	1	2	3	4	5	6	7	8	9	10	11
49	69	Keerthi. S	1	2	3	4	5	6	7	8	9	10	11
50	(90) 70	Keshav. G.K	1	2	3	4	5	6	7	8	9	10	11
No. of Absents													
Initials													

# ASSESSMENT

Avg. JA

19	20	23	24	29	30	1	3	5	8
12	12	12	12	12	12	1	1	1	1
32	33	34	35	36	37	38	39	40	41
32	33	34	35	36	37	38	39	40	41
30	31	32	33	34	35	36	37	38	39
32	33	34	35	36	37	38	39	40	41
32	33	34	35	36	37	38	39	40	41
32	33	34	35	36	37	38	39	40	41
31	32	33	34	35	36	37	38	39	40
31	32	33	34	35	36	37	38	39	40
32	33	34	35	36	37	38	39	40	41
31	32	33	34	35	36	37	38	39	40
31	32	33	34	35	36	37	38	39	40
31	32	33	34	35	36	37	38	39	40
31	32	33	34	35	36	37	38	39	40
30	31	32	33	34	35	36	37	38	39
30	31	32	33	34	35	36	37	38	39
30	31	32	33	34	35	36	37	38	39
29	30	31	32	33	34	35	36	37	38
32	33	34	35	36	37	38	39	40	41
31	32	33	34	35	36	37	38	39	40
31	32	33	34	35	36	37	38	39	40
30	31	32	33	34	35	36	37	38	39
32	33	34	35	36	37	38	39	40	41
29	30	31	32	33	34	35	36	37	38
28	28	29	30	31	32	33	34	35	36
32	33	34	35	36	37	38	39	40	41
37	38	39	40	41	42	43	44	45	46


ttn.	Test Marks					Sessional Marks	Theory CIE	Practical CIE	Remarks	Final CIE
	IA <sub>1</sub>	IA <sub>2</sub>	Assig <sub>1</sub>	Assig <sub>2</sub>	Avg. Assig					
	1	2	3	4	5					
	20	23	10	10	10	13	23	25	48	
	10	13	10	10	10	07	17	23	40	
	25	20	10	10	10	14	24	25	49	
	25	22	10	10	10	15	25	25	50	
	25	22	10	10	10	15	25	25	50	
	04	20	10	10	10	08	18	22	40	
	05	13	10	10	10	06	16	23	39	
	20	22	10	10	10	13	23	25	48	
	17	21	10	10	10	12	22	25	47	
	24	16	10	10	10	12	22	25	47	
	25	25	10	10	10	15	25	25	50	
	20	22	10	10	10	13	23	25	48	
	07	18	10	10	10	08	18	24	42	
	10	19	10	10	10	09	19	25	44	
	20	25	10	10	10	14	24	25	49	
	16	10	10	10	10	08	18	25	43	
	25	25	10	10	10	15	25	25	50	
	15	21	10	10	10	11	21	25	46	
	25	19	10	10	10	14	24	25	49	
	11	16	10	10	10	09	19	25	44	
	20	22	10	10	10	13	23	25	48	
	13	05	10	10	10	06	16	25	41	
	19	16	10	10	10	11	21	25	46	
	23	22	10	10	10	14	24	25	49	
	25	25	10	10	10	15	25	25	50	


# LESSON PLAN

Week	Date		Topics Planned
	From	To	
I	19/9/23	23/9/23	Module-1 Introduction working principle and applications of conductometric sensors, electrochemical sensors, Thermometric sensors, Optical sensors, sensors for the measurement of DO, electrochemical
II	25/9/23	30/9/23	Sensors for the pharmaceuticals, electrochemical gas sensor for SO <sub>x</sub> and NO <sub>x</sub> . Disposable sensor in the detection of biomolecules, pesticides.
III	3/10/23	6/9/23-	Energy systems:- Introduction to batteries, construction & working of li-ion, Sodium ion batteries, Quantum dot sensitised solar cell.
IV	9/10/23	14/10/23.	Module-2 :- Introduction, basic concepts of electronic memory, history of organic/polymer memory devices, classification of electronic memory devices, types of
V	16/10/23	20/10/23	organic memory devices, Display system:- Photoactive electroactive materials Nanomaterials, organic materials used in optoelectronic devices, liquid crystals, classification, Properties and application in liquid crystal display. Properties and application of OLEDs, QLEDs, light emitting electrochemical cells.
VI	25/10/23	28/10/23.	
VII	30/10/23	3/11/23.	Module-3 Corrosion:- Electrochemical theory of corrosion, types of corrosion - differential metal differential aeration. Cathodization, Anodization
VIII	6/11/23	11/11/23	Sacrificial anode method. CPR - Problems. Electrode systems:- Introduction, types of electrodes, Ion selective electrodes, construction & working of

# LESSON PLAN


Week	Date		Topics Planned
	From	To	
IX	13/11/23	17/11/23	glass electrode. Determination of pH using glass electrode. Reference electrode. Introduction calomel electrode, concentration cell. Definition construction & numerical problems.
X	20/11/23	25/11/23	Analytical Tech:- Introduction, principle, instrumentation of conductometry, Application in the estimation of weak acid, potentiometry
XI	27/11/23	1/12/23	Estimation of iron. Module 4:- Polymers:- Introduction, molecular wt. member Avg. conducting polymers.
XII	4/12/23	9/12/23	Synthesis and conduction mech. in polyacetylene and commercial applications Preparation, properties & application of graphene
XIII	11/12/23	15/12/23	Oxide. Green fuels:- Introduction, construction & working of solar cell, advantages & disadvantages. Generation of H <sub>2</sub> by alkaline electrolysis and
XIV	18/12/23	23/12/23	polymer electrolyte membrane electrolysis. Module 5:- Introduction, sources of e-waste, composition, characteristics & need of e-waste management. Toxic materials used in electronic
XV	26/12/23	30/12/23	& electrical products, health hazards due to exposure to e-waste. Recycling and recovery Approaches of recycling (separation, thermal, hydrometallurgical extraction, direct recycling).
XVI	3/1/24	05/01/24	Extraction of gold from e-waste. Role of stake holders in environmental management - Producers, consumers, recyclers & statutory bodies.

.....  
  
 Teacher's Signature

.....  
  
 HOD'S Signature

# RECORD OF CLASS WORK


Date	Period	Topics Covered
23/9		Introduction to electrode systems
3/10	2nd.	construction & working of calomel electrode.
4/10	1st	" " " of conc. cell.
6/10	2nd.	Problems on conc. cell.
11/10	1st	Construction & working of Glass electrode.
12/10	1st	Set. of pH using glass electrode.
16/10	4th	Problems on conc. cell.
20/10	2nd.	Polymers $\bar{M}_n$ , $\bar{M}_w$ . Set. Problems on $\bar{M}_n$ , $\bar{M}_w$
25/10	1st	Problems on $\bar{M}_n$ , $\bar{M}_w$
27/10	2nd.	Conduction Mech. in Polyacetylene.
3/11	2nd	Kevlar, Graphene oxide.
8/11	1st	Instrumentation Principle, application Potentiometer
10/11	2nd	Instrumentation, Principle, application Conductometry
11/11	2nd.	Construction & working of PV cell.
20/11	4th	Construction & working of alkaline electrolyzer
22/11	1st	construction & working of PEM.
27/11	2nd.	Electrochemical sensor, conductometric sensor.
28/11	3rd.	Electrochemical sensor for det. DO.
29/11	1st	" " for Diclofenac, $SO_2$ & $NH_3$
1/12	2nd.	Disposable sensor for glyphosate, ascorbic acid.
4/12	2nd	Thermometric sensor, optical sensor.
6/12	1st-	Na-ion battery, Batteries substand.
8/12		
9/12		

.....  
  
 Teacher's Signature

.....  
  
 HOD'S Signature

# RECORD OF CLASS WORK

Date	Period	Topics Covered
11/12	4th	Display systems - IPS TFT, Si nanomaterials
12/12	1st	Liquid crystal classification
18/12	4th	Application in LCD.
19/12	2nd	Application in OLED,
20/12	1st	Photoactive & electroactive materials, PVT as optoelectronic material.
23/12	2nd	Memory devices - classification,
25/12	1st	P-type, n-type memory devices, Polymer <sup>Memory device</sup>
29/12	2nd	Electrochemical study of corrosion, diff. aeration, diff. met.
30/12	2nd	Cathodization, Anodization
1/1	4th	Sacrificial anode method, CPR Problems.
3/1	1st	Composition of e-waste, characteristics, Toxic materials in e-waste
5/1	2nd	Health hazards to e-waste, Recycling, recovery
8/1	4th	separation, thermal, direct recycling.
10/1	1st	Extraction of gold from e-waste,
12/1	2nd	Role of stakeholders Producers, consumers, recyclers & statutory bodies in e-waste management.

.....  
  
 Teacher's Signature

.....  
  
 HOD'S Signature





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## DEPARTMENT OF APPLIED SCIENCE & HUMANITIES

ACADEMIC YEAR 23-24 EVEN SEMESTER

### CIRCULAR

Ref No: CEC/S&H/DAC/ACY 2023-24/OR/01

Date: 01-03-2024

This is to inform the members of Department Advisory Committee that meeting is scheduled on 04-03-2024 at 11: 00 AM in Physics Laboratory.

#### Agenda:

- Commencement of classes for 2<sup>nd</sup> semester students
- Phase II Student Induction Programme for 2<sup>nd</sup> semester students
- Conduction of Talents Day
- Organizing Battle of Science- Project Exhibition
- Organizing value added courses/ circular courses in the curriculum
- Organizing FDP

HOD

Mrs. Nagasree G

HEAD OF THE DEPT. OF PHYSICS  
CITY ENGINEERING COLLEGE  
Doddakallasandra, Off Kanakapura Main Road,  
BANGALORE - 560 062.



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## DEPARTMENT OF APPLIED SCIENCE & HUMANITIES

### Department Advisory Committee Meeting

**Date:** 04/03/2024

**Time:** 11:00 AM

**Venue:** Physics Laboratory

#### List of DAC Members

Sl. No	Member Name	Designation	Role	Signature
1	Dr. Rajasekhar. P	HOD & Professor	Convenor	
2	Dr. Jyothi. P	HOD & Professor	Member	
3	Mrs. Nagasree. G	Assistant Professor	Member	
4	Dr. Sunitha. N	Associate Professor	Member	
5	Mrs. Vanitha. G .R	Assistant Professor	Member	
6	Mr. Rekha. R	Assistant Professor	Member	
7	Mrs. Anitha. C. V	Assistant Professor	Member	
8	Ms. Janavi. R	Assistant Professor	Member	
9	Ms. Bhavitha. B. G	Assistant Professor	Member	
10	Ms. Meghana.. D	Assistant Professor	Member	
11	Mrs. Swaroopini B S	Assistant Professor	Member	
12	Mr. Sadashiva. R	Assistant Professor	Member	
13	Mr. Dinesh	Assistant Professor	Member	
14	Mr. Satish Babu G	HCL, Bangalore 9177512803	Member	

#### Agenda of the Meeting:

- Commencement of classes for 2<sup>nd</sup> semester students
- Phase II Student Induction Programme for 2<sup>nd</sup> semester students
- Conduction of Talents day



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- Organizing Battle of Science- Project Exhibition
- Organizing value added courses/ certificate courses in the curriculum
- Organizing FDP

## Minutes of Meeting:

The members discussed suggestions for improvement and reviewed the meeting agenda.

- Battle of Science is a project exhibition focuses on displaying interests and diverse projects.
- Discussed about a location with enough space for display of projects and ECE laboratory are chosen for exhibition.
- Setting up a registration process for participants.
- Providing certificates to all participants and cash prize for winners.
- Value added course on public speaking skills to be organized.

**Convenor**

**Dr. Rajasekhar. P**

**Dr P. RAJASEKHAR,**  
M.Sc; M.Phil; Ph.D  
HEAD OF THE DEPT. OF CHEMISTRY  
CITY ENGINEERING COLLEGE,  
Doddakallasandra, Kanakapura Main Road  
BANGALORE - 560 062.  
Ph (O) 26659313 (M) 92428 92734

**HOD**

**Mrs. Nagasree G**

**HEAD OF THE DEPT. OF PHYSICS**  
CITY ENGINEERING COLLEGE,  
Doddakallasandra, Kanakapura Main Road,  
BANGALORE - 560 062.



# ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ

(ವಿ ಟಿ ಯು ಅಧಿನಿಯಮ 1994 ರ ಅಡಿಯಲ್ಲಿ ಕರ್ನಾಟಕ ಸರ್ಕಾರದಿಂದ ಸ್ಥಾಪಿತವಾದ ರಾಜ್ಯ ವಿಶ್ವವಿದ್ಯಾಲಯ)

## VISVESVARAYA TECHNOLOGICAL UNIVERSITY

(State University of Government of Karnataka Established as per the VTU Act, 1994)

Phone : 0831-2498100 / 240546

Fax : 0831-2405467

Email : registrar@vtu.ac.in

Web : https://vtu.ac.in

Reference:VTU/BOS/AC2023-24(EVEN)/6251

2 FEB 2024

### NOTIFICATION

**Subject:** Tentative Academic Calendar for II sem B.E./B.Tech/B.Plan/B.Des/B.Arch, IV sem B.Arch./B.Plan., and VI sem of B.Arch/B.Plan, regarding...

**Reference:** Hon'ble Vice-Chancellor's approval Dated: 08.02.2024

The tentative academic calendar concerned with EVEN semesters of undergraduate programs(II sem B.E./B.Tech/B.Plan/B.Des/B.Arch, IV sem B.Arch./B.Plan., and VI sem of B.Arch/B.Plan)is attached to this notification for reference to all the stakeholders concerned.

The principals of non-autonomous, constituent, and autonomous engineering colleges and chairpersons of university departments are hereby informed to bring the academic calendar to the attention of all concerned.

If any suggestions/clarification/corrections, email-[sbhalbhavi@vtu.ac.in](mailto:sbhalbhavi@vtu.ac.in)

Sd/-

REGISTRAR

To,

1. The Principals of all Non-autonomous/ constituent /Autonomous Engineering Colleges under the ambit of VTU Belagavi.
2. The chairperson, of the Department of Mechanical Engineering /Civil Engineering /Computer Science and Engineering& Communication Electronics Engineering of the University.

Copy to.

1. To the Hon'ble Vice-Chancellor through the secretary to VC, VTU Belagavi for information
2. The Registrar (Evaluation), VTU Belagavi for information and needful.
3. The Regional Directors (I/c) of all the regional offices of VTU for circulation.
4. The Director ITI SMU, VTU Belagavi for information and to make arrangements to upload the Academic Calendar on the VTU web portal.
5. The Director of Physical Education, VTU Belagavi for information
6. The Director, Central Placement Cell, VTU Belagavi for information
7. The Special Officer Library, VTU Belagavi for information
8. All the concerned Special Officer/s and Caseworker/s of the academic section, VTU, Belagavi.
9. Office copy

R. 12/02/24 BE

REGISTRAR

7/10/24

## Academic Calendar for EVEN Semester for the year 2023-24

	II semester B.E./B.Tech	II semester B.Plan/B.Arch/ B.Des	II semester B.Sc(Hons)	IV semester B.Arch.	IV semester B.Plan	VI Semester B.Arch.	VI semester B. Plan
Commencement of the Semester	06.03.2024	06.03.2024	04.03.2024	04.03.2024	04.03.2024	26.02.2024	06.03.2024
Internship / Students Induction Program	---	---	---	---	---	---	---
Commencement of Classes	06.03.2024	06.03.2024	06.03.2024	06.03.2024	06.03.2024	26.02.2024	06.03.2024
Last Working day of the Semester	29.06.2024	29.06.2024	29.06.2024	29.06.2024	29.06.2024	22.06.2024	29.06.2024
Practical Examination	01.07.2024 To 11.07.2024	01.07.2024 To 11.07.2024	01.07.2024 To 06.07.2024	01.07.2024 To 06.07.2024	01.07.2024 To 06.07.2024	25.07.2024 To 31.07.2024	01.07.2024 To 06.07.2024
Theory Examinations	15.07.2024 To 10.08.2024	15.07.2024 To 10.08.2024	08.07.2024 To 27.07.2024	08.07.2024 To 27.07.2024	08.07.2024 To 02.08.2024	08.07.2024 To 02.08.2024	08.07.2024 To 02.08.2024
Internship/ Practical Exam for Lateral Entry Students	---	---	---	---	03.08.2024 To 31.08.2024	---	03.08.2024 To 31.08.2024
Internship Viva Voce/ Project viva	---	---	---	---	---	---	---
Commencement of NEXT Semester	19.08.2024	19.08.2024	19.08.2024	05.08.2024	02.09.2024	05.08.2024	02.09.2024

  
**REGISTRAR**  
 Visvesvaraya Technological University  
 BELAGAVI.

CITY ENGINEERING COLLEGE, BENGALURU-560061. ACADEMIC CALENDAR 2023-24 (EVEN SEM) DEPARTMENT OF APPLIED SCIENCE & HUMANITIES																
FEB 2024		MARCH 2024			APRIL 2024			MAY 2024		JUNE 2024			JULY 2024		AUGUST 2024	
DAY	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT		
MON					1						1	1 <sup>st</sup> to 11 <sup>th</sup> July 24 Practical Exam II Sem B. E				
TUE					2						2					
WED					3			1	Holiday – May Day		3					
THU	1				4			2	Sports Day		4		1			
FRI	2		1		5			3	Sports Day		5		2			
SAT	3	1st Saturday Holiday	2	1st Saturday Holiday	6	1st Saturday Holiday	4	1st Saturday Holiday	1	1st Saturday Holiday	6	1st Saturday Holiday	3	1st Saturday Holiday		
SUN	4		3		7		5		2		7		4			
MON	5		4		8		6		3		8		5			
TUE	6		5		9	Holiday – Chandramana Ugadi	7		4		9		6			
WED	7		6	Commencement of Classes of II Sem B. E II phase orientation pgm	10		8	Ethnic Day	5		10		7			
THU	8		7	II phase orientation pgm	11	Holiday – Qutub-e-Ramzan	9	College Day	6		11		8			
FRI	9		8	Holiday -Maha Shiva Ratri	12		10	Holiday – Basava Jayanthi	7	Seminar for II sem students	12		9			
SAT	10		9	II phase orientation pgm	13	Alumni Meet	11		8	FDP for first year faculty	13		10			
SUN	11		10		14		12		9		14		11			
MON	12		11	II phase orientation pgm	15		13		10		15	15 <sup>th</sup> July to 10 <sup>th</sup> Aug 24- Theory Exam- II Sem B. E	12			
TUE	13		12	II phase orientation pgm	16	16 <sup>th</sup> to 18 <sup>th</sup> April 24, I-Test IInd Semester	14		11		16		13			
WED	14		13	II phase orientation pgm	17		15		12		17	Holiday - Muharram	14			
THU	15		14	II phase orientation pgm	18		16		13		18		15	Holiday – Independence Day		
FRI	16		15	II phase orientation pgm	19		17		14		19		16			
SAT	17	3rd Saturday Holiday	16	3rd Saturday Holiday	20	3rd Saturday Holiday	18	3rd Saturday Holiday	15	3rd Saturday Holiday	20	3rd Saturday Holiday	17	3rd Saturday Holiday		
SUN	18		17		21		19		16		21		18			
MON	19		18		22		20		17	Holiday - Bakrid	22		19			
TUE	20		19		23		21		18	18 <sup>th</sup> to 20 <sup>th</sup> June 24, II-Test IInd Semester	23		20			
WED	21		20		24	Display of Ist Test IA Marks on NB and ERP Communication to parents	22		19		24		21			
THU	22		21		25		23		20		25		22			
FRI	23		22		26	"Battle of Science" for IInd Sem Students	24		21		26		23			
SAT	24		23	"Talents Day" for IInd Sem Students	27	PTM – 2nd Semester	25	Seminar for II sem students	22	Graduation Day	27		24			
SUN	25		24		28		26		23		28		25			
MON	26		25		29		27		24	II sem Lab internals 24th to 28 <sup>th</sup> June 2024	29					
TUE	27		26		30		28		25		30		27			
WED	28		27				29		26	Display of IInd IA Marks on NB and ERP Communication to parents	31		28			
THU	29		28				30		27				29			
FRI			29	Holiday – Good Friday			31		28				30			
SAT			30	Scavenger Society(Dept of Humanities)					29	Last Working Day of The II Semester B. E			31			
SUN			31						30							



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**ACADEMIC YEAR: 2023-24**

## **DEPARTMENT OF APPLIED SCIENCE & HUMANITIES**

### **COURSE PREFERENCE**

Name of the Faculty: Mrs. Nagasree G

Designation: Assistant Professor

Sl. No	Course Code and Name	Year/Semester
1.	BPHYS202 Applied Physics for Computer Science & Engineering Scheme For D, E sections	2024/II

Signature of Faculty

Mrs. Nagasree G

HOD

Mrs. Nagasree G



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**ACADEMIC YEAR: 2023-24**

## DEPARTMENT OF APPLIED SCIENCE & HUMANITIES

### COURSE PREFERENCE

Name of the Faculty: Mr. Dinesh S

Designation: Assistant Professor

Sl. No	Course Code and Name	Year/Semester
1.	BPHS202 Applied Physics for Computer Science & Engineering Scheme For F section	2024/II

Signature of Faculty

Mr. Dinesh S

HOD

Mrs. Nagasree G





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**ACADEMIC YEAR: 2023-24**

## **DEPARTMENT OF APPLIED SCIENCE & HUMANITIES**

### **COURSE PREFERENCE**

Name of the Faculty: Mr. Dinesh S

Designation: Assistant Professor

Sl. No	Course Code and Name	Year/Semester
1.	BPHYLS202 Applied Physics for Computer Science & Engineering Scheme - Laboratory	2024/II

Signature of Faculty

Mr. Dinesh S

HOD

Mrs. Nagasree G

**CITY ENGINEERING COLLEGE**  
**TIME TABLE –SECOND SEMESTER MARCH – 2023-2024**  
**SCHEME- 2022PHYSICS CYCLE**

SECTION: D

BRANCH: CS

ROOM NO: A007

DAY	9:00-10:00	10:00-11:00	11:00-11:15	11:15 -12:15	12:15-1:15	1:15-2:00	2:00-3:00	3:00-4:00	4:00-5:00		
MON	BPHYS202 (T)	BIDTK258	<b>BREAK</b>	BMATS201	BESCK204D	<b>LUNCH</b>	← PHYL/POPL/MATL/D1/D2/D3 →				
TUE	BMATS201	BPOPS203		← PHYL/POPL/MATLD2/D3/D1 →			Mentor-Mentee Meeting A1/A2/A3				
WED	BPHYS202	BETCK205H		BESCK204D	BMATS201 (T)		BETCK205H	BPHYS202(T)			
THU	BPOPS203	BPHYS202		BKSKK207	BETCK205H		← PHYL/POPL/MATL/D3/D1/D2 →				
FRI	BMATS201 (T)	BESCK204D		BPWSK206	BKBKK207		CLUB ACTIVITY				
SAT	SPORTS			LIBRARY							

SUBJECT CODE	SUBJECT NAME	NO. OF HOURS	FACULTY NAME
BMATS201	Mathematics for CSE Stream	4	Prof. Anitha.C.V
BPHYS202	Physics for CSE Stream	4	Prof. Nagasree. G / Prof. Dinesh
BPOPS203	Principles of Programming using C	2	Prof. Spoorthi
BESCK204D	Introduction to Mechanical Engineering	3	Dr. Mathenulla
BETCK205H	Introduction to Internet of Things	3	Prof. Nayana H S
BPWSK206	Professional Writing Skills in English	1	Prof. Swaroopini.B.S
BKSKK207/BKBKK207	Samskruthika Kannada/ Balake Kannada	1	Prof. Deepa.G
BIDTK258	Innovation & Design Thinking	1	Prof. Vinay Kumar
MATL	Mat Lab	2x3	Prof. Anitha/Prof. Vanitha. G.R
PHYL	Physics Lab	2x3	Prof. Nagasree. G / Prof. Dinesh
POPL	Principles of Programming using C Lab	2x3	Prof. Spoorthi

  
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 K.R.2323pura Main Road, BANGALORE - 560 061



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## CITY ENGINEERING COLLEGE

TIMETABLE –SECOND SEMESTER – MARCH – 2023-2024 SCHEME-2022  
PHYSICS CYCLE

SECTION: E

BRANCH: CS

ROOM NO: A006

DAY	9:00-10:00	10:00-11:00	11:00-11:15	11:15 -12:15	12:15-1:15	1:15-2:00	2:00-3:00	3:00-4:00	4:00-5:00	
MON	BESCK204D	BPOPS203	BREAK	←PHYL/POPL/MATL/E3/E1/E2→		LUNCH	BPHYS202(T)	BMATS201(T)		
TUE	BETCK205H	BESCK204D		BKSKK207	BPHYS202 (T)		←PHYL/ POPL/MATL /E1/E2/E3→			
WED	BPOPS203	BMATS201		←PHYL/ POPL/MATL /E2/E3/E1→			Mentor-Mentee Meeting B1/B2/B3			
THU	BMATS201	BIDTK258		BESCK204D	BPWSK206		BETCK205H	BPHYS202		
FRI	BPHYS202	BETCK205H		BMATS201 (T)	BKBKK207		CLUB ACTIVITY			
SAT	SPORTS			LIBRARY						

SUBJECT CODE	SUBJECT NAME	NO OF HOURS	FACULTY NAME
BMATS201	Mathematics for CSE Stream	4	Prof. Janavi.R
BPHYS202	Physics for CSE Stream	4	Prof. Nagasree. G / Prof. Dinesh
BPOPS203	Principles of Programming using C	2	Prof. Spoorthi
BESCK204D	Introduction to Mechanical Engineering	3	Prof. Anil.R
BETCK205H	Introduction to Internet of Things	3	Prof. Nayana H S
BPWSK206	Professional Writing Skills in English	1	Prof. Swaroopini.B.S
BKSKK207/BKBKK207	Samskruthika Kannada/ Balake Kannada	1	Prof. Deepa.G
BIDTK258	Innovation & Design Thinking	1	Prof. Vinay Kumar
MATL	Mat Lab	2x3	Prof. Janavi.R/ Prof. Anitha
PHYL	Physics Lab	2x3	Prof. Nagasree. G / Prof. Dinesh
POPL	C-Programming Lab	2x3	Prof. Spoorthi



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# CITY ENGINEERING COLLEGE

TIMETABLE –SECOND SEMESTER – MARCH – 2023-2024 SCHEME-2022  
PHYSICS CYCLE

**SECTION: F**

**BRANCH: CS**

**ROOM NO: A005**

DAY	9:00-10:00	10:00-11:00	11:00-11:15	11:15 - 12:15	12:15-1:15	1:15-2:00	2:00-3:00	3:00-4:00	4:00-5:00	
MON	BPOPS203	BETCK205H	BREAK	BMATS201	BPHYS202	LUNCH	Mentor-Mentee Meeting F1/F2/F3			
TUE	BMATS201	BPHYS202		BPWSK206	BESCK204D		BPOPS203	BPHYS202(T)		
WED	BESCK204D	BMATS201(T)		BETCK205H	BPHYS202 (T)		← PHYL/OPL/MATL/F1/F2/F3→			
THU	BMATS201 (T)	BETCK205H		← PHYL/ POPL/MATL/F2/F3/F1→			BESCK204D	BKSKK207		
FRI	←PHYL/POPL/MATL/F3/F1/F2→			BIDTK258	BKBKK207		CLUB ACTIVITY			
SAT	SPORTS			LIBRARY						

SUBJECT CODE	SUBJECT NAME	NO OF HOURS	FACULTY NAME
BMATS201	Mathematics for CSE Stream	4	Prof. Bhavitha. B.G
BPHYS202	Physics for CSE Stream	4	Prof. Nagasree. G / Prof. Dinesh
BPOPS203	Principles of Programming using C	2	Prof. Spoorthi
BESCK204D	Introduction to Mechanical Engineering	3	Dr. Uma
BETCK205H	Introduction to Internet of Things	3	Prof. Nayana H S
BPWSK206	Professional Writing Skills in English	1	Prof. Swaroopini.B.S
BKSKK207/BKBKK207	Samskruthika Kannada/ Balake Kannada	1	Prof. Deepa.G
BIDTK258	Innovation & Design Thinking	1	Prof. Vinay Kumar
MATL	Mat Lab	2x3	Prof. Bhavitha. B.G/
PHYL	Physics Lab	2x3	Prof. Nagasree. G / Prof. Dinesh
POPL	C-Programming Lab	2x3	Prof. Spoorthi



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**PRINCIPAL**

**CITY ENGINEERING COLLEGE**  
**TIME TABLE –SECOND SEMESTER MARCH – 2023-24**  
**PHYSICS CYCLE**

**Mrs. Nagashree G**

DAY	9:00-10:00	10:00-11:00	11:00-11:15	11:15 -12:15	12:15-1:15	1:15-2:00	2:00-3:00	3:00-4:00	4:00-5:00
MON	D		<b>BREAK</b>		F	<b>LUNCH</b>	E	←-----PHYL / D1-----→	
TUE		F			E		←-----Mentor-Mentee Meeting D1-----→		
WED	D				F		← PHYL/F1→		
THU		D		← PHYL/ F2→			← PHYL/POPL/MATL/D3/D1/D2 →		
FRI	E								
SAT									



**HOD**  
**Mrs. Nagasree G**



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 Kanakapura Main Road, BANGALORE - 560 061

**PRINCIPAL**  
**Dr. Karunakara S**

**CITY ENGINEERING COLLEGE**  
**TIME TABLE –SECOND SEMESTER MARCH – 2023-24**  
**PHYSICS CYCLE**

Mrs. Dinesh S

DAY	9:00-10:00	10:00-11:00	11:00-11:15	11:15 -12:15	12:15-1:15	1:15-2:00	2:00-3:00	3:00-4:00	4:00-5:00
MON			<b>BREAK</b>	←-----PHYL/E3-----→		<b>LUNCH</b>	←-----PHYL/D1-----→		Mentor- Meeting F3
TUE				←-----PHYL/D2-----→				F	
WED				←-----PHYL/E2-----→				D	
THU									
FRI	←-----PHYL/F3-----→							E	
SAT									



**HOD**  
Mrs. Nagasree G



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**CITY ENGINEERING COLLEGE**  
 Kanakapura Main Road, BANGALORE - 560 061

**PRINCIPAL**  
Dr. Karunakara S

Course Title:	<b>Applied Physics for CSE Stream</b>		
Course Code:	<b>BPHYS102/202</b>	CIE Marks	50
Course Type (Theory/Practical/Integrated )	Integrated	SEE Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P: S)	2:2:2:0	Exam Hours	03
Total Hours of Pedagogy	40 hours Theory + 10-12 Lab slots	Credits	04
<b>Course objectives</b> <ul style="list-style-type: none"> <li>• To study the essentials of photonics and its application in computer science.</li> <li>• To study the principles of quantum mechanics and its application in quantum computing.</li> <li>• To study the electrical properties of materials</li> <li>• To study the essentials of physics for computational aspects like design and data analysis.</li> </ul>			
<b>Teaching-Learning Process</b> These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes and make Teaching –Learning more effective <ol style="list-style-type: none"> <li>1. Flipped Class</li> <li>2. Chalk and Talk</li> <li>3. Blended Mode of Teaching and Learning</li> <li>4. Simulations, Interactive Simulations and Animations</li> <li>5. NPTEL and Other Videos for theory topics</li> <li>6. Smart Class Room</li> <li>7. Lab Experiment Videos</li> </ol>			
<b>Module-1 (8 Hours)</b>			
<b>Laser and Optical Fibers:</b> <b>LASER:</b> Characteristic properties of a LASER beam, Interaction of Radiation with Matter, Einstein’s A and B Coefficients and Expression for Energy Density (Derivation), Laser Action, Population Inversion, Metastable State, Requisites of a laser system, Semiconductor Diode Laser, Applications: Bar code scanner, Laser Printer, Laser Cooling(Qualitative), Numerical Problems. <b>Optical Fiber:</b> Principle and Structure, Propagation of Light, Acceptance angle and Numerical Aperture (NA), Derivation of Expression for NA, Modes of Propagation, RI Profile, Classification of Optical Fibers, Attenuation and Fiber Losses, Applications: Fiber Optic networking, Fiber Optic Communication. Numerical Problems			
<b>Pre requisite: Properties of light</b> <b>Self-learning: Total Internal Reflection</b>			
<b>Module-2 (8 Hours)</b>			
<b>Quantum Mechanics:</b> de Broglie Hypothesis and Matter Waves, de Broglie wavelength and derivation of expression by analogy, Phase Velocity and Group Velocity, Heisenberg’s Uncertainty Principle and its application (Non existence of electron inside the nucleus - Non Relativistic), Principle of Complementarity, Wave Function, Time independent Schrödinger wave equation (Derivation), Physical Significance of a wave function and Born Interpretation, Expectation value, Eigen functions and Eigen Values, Particle inside one dimensional infinite potential well, Quantization of Energy States, Waveforms and Probabilities. Numerical Problems.			
<b>Pre requisite: Wave–Particle dualism</b> <b>Self-learning: de Broglie Hypothesis</b>			
<b>Module-3 (8 Hours)</b>			
<b>Quantum Computing:</b> <b>Principles of Quantum Information &amp; Quantum Computing:</b> Introduction to Quantum Computing, Moore’s law & its end, Differences between Classical & Quantum computing. Concept of qubit and its properties. Representation of qubit by Bloch sphere. Single and Two qubits. Extension to N qubits.			
<b>Dirac representation and matrix operations:</b> Matrix representation of 0 and 1 States, Identity Operator I, Applying I to $ 0\rangle$ and $ 1\rangle$ states, Pauli Matrices and its			

operations on  $|0\rangle$  and  $|1\rangle$  states, Explanation of i) Conjugate of a matrix and ii) Transpose of a matrix. Unitary matrix U, Examples: Row and Column Matrices and their multiplication (Inner Product), Probability, and Quantum Superposition, normalization rule. Orthogonality, Orthonormality. Numerical Problems

**Quantum Gates:**

**Single Qubit Gates:** Quantum Not Gate, Pauli – X, Y and Z Gates, Hadamard Gate, Phase Gate (or S Gate), T Gate

**Multiple Qubit Gates:** Controlled gate, CNOT Gate, (Discussion for 4 different input states). Representation of Swap gate, Controlled -Z gate, Toffoli gate.

**Pre requisites: Matrices**

**Self-learning: Moore's law**

**Module-4 (8 Hours)**

**Electrical Properties of Materials and Applications**

**Electrical Conductivity in metals**

Resistivity and Mobility, Concept of Phonon, Matheissen's rule, Failures of Classical Free Electron Theory, Assumptions of Quantum Free Electron Theory, Fermi Energy, Density of States, Fermi Factor, Variation of Fermi Factor With Temperature and Energy. Numerical Problems.

**Superconductivity**

Introduction to Super Conductors, Temperature dependence of resistivity, Meissner's Effect, Critical Field, Temperature dependence of Critical field, Types of Super Conductors, BCS theory (Qualitative), Quantum Tunnelling, High Temperature superconductivity, Josephson Junctions (Qualitative), DC and RF SQUIDS (Qualitative), Applications in Quantum Computing: Charge, Phase and Flux qubits, Numerical Problems.

**Pre requisites: Basics of Electrical conductivity**

**Self-learning: Resistivity and Mobility**

**Module-5 (8 hours)**

**Applications of Physics in computing:**

**Physics of Animation:**

Taxonomy of physics based animation methods, Frames, Frames per Second, Size and Scale, Weight and Strength, Motion and Timing in Animations, Constant Force and Acceleration, The Odd rule, Odd-rule Scenarios, Motion Graphs, Examples of Character Animation: Jumping, Parts of Jump, Jump Magnification, Stop Time, Walking: Strides and Steps, Walk Timing. Numerical Problems

**Statistical Physics for Computing:** Descriptive statistics and inferential statistics, Poisson distribution and modeling the probability of proton decay, Normal Distributions (Bell Curves), Monte Carlo Method: Determination of Value of  $\pi$ . Numerical Problems.

**Pre requisites: Motion in one dimension, Probability**

**Self-learning: Frames, Frames per Second**

**Course outcome (Course Skill Set)**

At the end of the course the student will be able to:

CO1	<b>Describe</b> the principles of LASERS and Optical fibers and their relevant applications.
CO2	<b>Discuss</b> the basic principles of the Quantum Mechanics and its application in Quantum Computing.
CO3	<b>Summarize</b> the essential properties of superconductors and its applications in qubits.
CO4	<b>Illustrate</b> the application of physics in design and data analysis.
CO5	<b>Practice</b> working in groups to conduct experiments in physics and <b>perform</b> precise and honest measurements.

**Assessment Details (both CIE and SEE)**

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50). The minimum passing mark for the SEE is 35% of the maximum marks (18 marks out of 50). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination(SEE), and a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.



**Continuous Internal Evaluation(CIE):**

The CIE marks for the theory component of the IC shall be **30 marks** and for the laboratory component **20 Marks**.

**CIE for the theory component of the IC**

- Three Tests each of 20 Marks; after the completion of the syllabus of 35-40%, 65-70%, and 90-100% respectively.
- Two Assignments/two quizzes/ seminars/one field survey and report presentation/one-course project totalling 20 marks.

Total Marks scored (test + assignments) out of 80 shall be scaled down to **30 marks**

**CIE for the practical component of the IC**

- On completion of every experiment/program in the laboratory, the students shall be evaluated and marks shall be awarded on the same day. The **15 marks** are for conducting the experiment and preparation of the laboratory record, the other **05 marks shall be for the test** conducted at the end of the semester.
- The CIE marks awarded in the case of the Practical component shall be based on the continuous evaluation of the laboratory report. Each experiment report can be evaluated for 10 marks. Marks of all experiments' write-ups are added and scaled down to 15 marks.
- The laboratory test (**duration 03 hours**) at the end of the 15<sup>th</sup> week of the semester /after completion of all the experiments (whichever is early) shall be conducted for 50 marks and scaled down to **05 marks**.

Scaled-down marks of write-up evaluations and tests added will be CIE marks for the laboratory component of IC/IPCC for **20 marks**.

- The minimum marks to be secured in CIE to appear for SEE shall be 12 (40% of maximum marks) in the theory component and 08 (40% of maximum marks) in the practical component. The laboratory component of the IC/IPCC shall be for CIE only. However, in SEE, the questions from the laboratory component shall be included. The maximum of 05 questions is to be set from the practical component of IC/IPCC, the total marks of all questions should not be more than 25 marks.

The theory component of the IC shall be for both CIE and SEE.

**Semester End Examination(SEE):**

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the subject (**duration 03 hours**)

- The question paper shall be set for 100 marks. The medium of the question paper shall be English/Kannada). The duration of SEE is 03 hours.
- The question paper will have 10 questions. Two questions per module. Each question is set for 20 marks. The students have to answer 5 full questions, selecting one full question from each module. The student has to answer for 100 marks and **marks scored out of 100 shall be proportionally reduced to 50 marks**.

There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), **should have a mix of topics** under that module.

**Suggested Learning Resources:****Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)**

1. Solid State Physics, S O Pillai, New Age International Private Limited, 8<sup>th</sup> Edition, 2018.
2. Engineering Physics by Gupta and Gour, Dhanpat Rai Publications, 2016 (Reprint).
3. A Textbook of Engineering Physics- M.N. Avadhanulu and P.G. Kshirsagar, 10th revised Ed, S. Chand. & Company Ltd, New Delhi.
4. Concepts of Modern Physics, Aurthur Beiser, McGrawhill, 6<sup>th</sup> Edition, 2009.
5. Lasers and Non Linear Optics, B B Loud, New age international, 2011 edition.
6. A Textbook of Engineering Physics by M.N. Avadhanulu, P G. Kshirsagar and T V S Arun Murthy, Eleventh edition, S Chand and Company Ltd. New Delhi-110055.
7. Quantum Computation and Quantum Information, Michael A. Nielsen & Isaac L. Chuang, Cambridge Universities Press, 2010 Edition.

8. Quantum Computing, Vishal Sahani, McGraw Hill Education, 2007 Edition.
9. Quantum Computing – A Beginner’s Introduction, Parag K Lala, Indian Edition, Mc GrawHill, Reprint 2020.
10. Engineering Physics, S P Basavaraj, 2005 Edition, Subhash Stores.
11. Physics for Animators, Michele Bousquet with Alejandro Garcia, CRC Press, Taylor & Francis, 2016.
12. Quantum Computation and Logic: How Quantum Computers Have Inspired Logical Investigations, Maria Luisa Dalla Chiara, Roberto Giuntini, Roberto Leporini, Giuseppe Sergioli, Trends in Logic, Volume 48, Springer.
13. Statistical Physics: Berkely Physics Course, Volume 5, F. Reif, McGraw Hill.
14. Introduction to Superconductivity, Michael Tinkham, McGraw Hill, INC, II Edition

**Web links and Video Lectures (e-Resources):**

**LASER:** <https://www.youtube.com/watch?v=WgzynecPiyc>

**Superconductivity :** <https://www.youtube.com/watch?v=MT5Xl5ppn48>

**Optical Fiber :** [https://www.youtube.com/watch?v=N\\_kA8EpCUQo](https://www.youtube.com/watch?v=N_kA8EpCUQo)

**Quantum Mechanics :** <https://www.youtube.com/watch?v=p7bzE1E5PMY&t=136s>

**Quantum Computing :** <https://www.youtube.com/watch?v=jHoEjvuPoB8>

**Quantum Computing :** <https://www.youtube.com/watch?v=ZuvCUU2jD30>

**Physics of Animation :** [https://www.youtube.com/watch?v=kj1kaA\\_8Fu4](https://www.youtube.com/watch?v=kj1kaA_8Fu4)

**Statistical Physics Simulation :** [https://phet.colorado.edu/sims/html/plinko-probability/latest/plinko-probability\\_en.html](https://phet.colorado.edu/sims/html/plinko-probability/latest/plinko-probability_en.html)

**NPTEL Superconductivity:** <https://archive.nptel.ac.in/courses/115/103/115103108/>

**NPTEL Quantum Computing :** <https://archive.nptel.ac.in/courses/115/101/115101092>

**Virtual LAB :** <https://www.vlab.co.in/participating-institute-amrita-vishwa-vidyapeetham>

**Virtual LAB :** <https://vlab.amrita.edu/index.php?sub=1&brch=189&sim=343&cnt=1>

**Activity Based Learning (Suggested Activities in Class)/ Practical Based learning**

<http://nptel.ac.in> <https://swayam.gov.in>

[https://virtuallabs.merlot.org/vl\\_physics.html](https://virtuallabs.merlot.org/vl_physics.html)

<https://phet.colorado.edu>

<https://www.myphysicslab.com>

**Laboratory Component:**

Any Ten Experiments have to be completed from the list of experiments

**Note:** The experiments have to be classified into

- a) Exercise
- b) Demonstration
- c) Structured Inquiry
- d) Open Ended

Based on the convenience classify the following experiments into above categories. Select at least one simulation/spreadsheet activity.

**List of Experiments**

1. Determination of wavelength of LASER using Diffraction Grating.
2. Determination of acceptance angle and numerical aperture of the given Optical Fiber.
3. Determination of Magnetic Flux Density at any point along the axis of a circular coil.
4. Determination of resistivity of a semiconductor by Four Probe Method
5. Study the I-V Characteristics of the Given Bipolar Junction Transistor.
6. Determination of dielectric constant of the material of capacitor by Charging and Discharging method.
7. Study the Characteristics of a Photo-Diode and to determine the power responsivity / Verification of Inverse Square Law of Intensity of Light.
8. Study the frequency response of Series & Parallel LCR circuits.
9. Determination of Planck's Constant using LEDs.
10. Determination of Fermi Energy of Copper.
11. Identification of circuit elements in a Black Box and determination of values of the components.
12. Determination of Energy gap of the given Semiconductor.
13. Step Interactive Physical Simulations.
14. Study of motion using spread Sheets
15. Study of Application of Statistics using spread sheets
16. PHET Interactive Simulations(<https://phet.colorado.edu/en/simulations/filter?subjects=physics&type=html.prototype>)

**COs and POs Mapping (Individual teacher has to fill up)**

COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	3	2	-	-	-	-	-	-	-	-	-	2
CO2	3	3	-	-	-	-	-	-	-	-	-	2
CO3	3	3	-	-	-	-	-	-	-	-	-	2
CO4	3	2	1	-	1	-	-	-	-	-	-	2
CO5	3	2	1	-	2	-	-	3	3	-	-	2

**Level 3- Highly Mapped, Level 2-Moderately Mapped, Level 1-Low Mapped,**

**Note :** The CO-PO mapping values are indicative. The course coordinator can alter the mapping using **Competency and Performance Indicators** mentioned in the **AICTE Exam reforms**.



## DEPARTMENT OF PHYSICS

### LESSON PLAN FOR EVEN SEMESTER FOR ACADEMIC YEAR 2023 - 2024

Course Title: Applied Physics for CSE stream	Course Code : BPHYS202
Total contact hours: L:T:P:S :: 2:2:2:0	Course Type : Integrated
CIE Marks : 50 SEE Marks :50	Total Marks : 100
Semester: II	Academic year : 2023-2024
Lesson plan Author: Dr. K Sujatha, Nagashree G, Dinesh S	Date :06/03/2024

#### Course Objective:

- To study the essentials of photonics and its application in computer science.
- To study the principles of quantum mechanics and its application in quantum computing.
- To study the electrical properties of materials
- To study the essentials of physics for computational aspects like design and data analysis.

#### Course Outcomes:

After studying this course, students will be able to:

CO1- Describe the principles of LASERS and Optical fibers and their relevant applications.

CO2 -Discuss the basic principles of the Quantum Mechanics and its application in Quantum Computing.

CO3- Summarize the essential properties of superconductors and its applications in qubits.

CO4- Illustrate the application of physics in design and data analysis.

CO5- Practice working in groups to conduct experiments in physics and perform precise and honest measurements.

### MODULE-1

Week	Days/ Date	Contents of Module Lasers and Optical Fibers	Bloom's Taxonomy Level	Course Outcome (CO)
1	1	Characteristic properties of a LASER beam, Interaction of Radiation with Matter, Einstein's A and B	R,U	CO1
	2	Coefficients and Expression for Energy Density (Derivation), Laser Action,	R,U	CO1
	3	Population Inversion, Metastable State, Requisites of a laser system,	R,U	CO1
	4	Semiconductor Diode Laser, Applications: Bar code scanner, Laser Printer, Laser Cooling(Qualitative), Numerical Problems	R,U,E,C	CO1
2	1	Principle and Structure, Propagation of Light,	R,U	CO1
	2	Acceptance angle and Numerical Aperture (NA),	R,U	CO1
	3	Derivation of Expression for NA, Modes of Propagation, RI Profile, Classification of Optical Fibers,	R,U	CO1
	4	Attenuation and Fiber Losses, Applications: Fiber Optic networking, Fiber Optic Communication. Numerical Problems	R,U	CO1

### MODULE-2

Week	Days/ Date	Contents of Module Quantum Mechanics	Bloom's Taxonomy Level	Course Outcome (CO)
3	1	de Broglie Hypothesis and Matter Waves, de Broglie wavelength	R,U	CO2
	2	derivation of expression by analogy, Phase Velocity and Group Velocity	R,U	CO2
	3	Heisenberg's Uncertainty Principle and its application (Non existence of electron inside the nucleus - Non Relativistic),	R,U	CO2
	4	Principle of Complementarity, Wave Function, Time independent Schrödinger wave equation (Derivation)	R,U	CO2
4	1	Physical Significance of a wave function and Born Interpretation	R,U	CO2
	2	Expectation value, Eigen functions and Eigen Values,	R,U	CO2
	3	Particle inside one dimensional infinite potential well,	R,U	CO2
	4	Quantization of Energy States, Waveforms and Probabilities. Numerical Problems	R,U	CO2

### MODULE-3

Week	Days/ Date	Contents of Module Quantum Computing	Bloom's Taxonomy Level	Course Outcome (CO)
5	1	Introduction to Quantum Computing, Moore's law & its end	R,U	CO2
	2	Differences between Classical & Quantum computing. Concept of qubit and its properties.	R,U	CO2
	3	Representation of qubit by Bloch sphere. Single and Two qubits. Extension to N qubits.	R,U,E	CO2
	4	Matrix representation of 0 and 1 States, Identity Operator I, Applying I to $ 0\rangle$ and $ 1\rangle$ states, Pauli Matrices and its operations on $ 0\rangle$ and $ 1\rangle$ states,	R,U	CO2
6	1	Explanation of i) Conjugate of a matrix and ii) Transpose of a matrix. Unitary matrix U, Examples: Row and Column Matrices and their multiplication (Inner Product),	R,U	CO2
	2	Probability, and Quantum Superposition, normalization rule. Orthogonality, Orthonormality. Numerical Problems	R,U	CO2
	3	Single Qubit Gates: Quantum Not Gate, Pauli – X, Y and Z Gates, Hadamard Gate, Phase Gate (or S Gate), T Gate	R,U	CO2
	4	Multiple Qubit Gates: Controlled gate, CNOT Gate, (Discussion for 4 different input states). Representation of Swap gate, Controlled -Z gate, Toffoli gate.	R,U	CO2

### MODULE-4

Week	Days/ Date	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
7	1	Resistivity and Mobility, Concept of Phonon, Matheissen's rule,	R,U,	CO3
	2	Failures of Classical Free Electron Theory	R,U	CO3
	3	Assumptions of Quantum Free Electron Theory, Fermi Energy, Density of States,	R,U	CO3
	4	Fermi Factor, Variation of Fermi Factor With Temperature and Energy. Numerical Problems	R,U	CO3
8	1	Introduction to Super Conductors, Temperature dependence of resistivity	R,U	CO3
	2	Meissner's Effect, Critical Field, Temperature dependence of Critical field, Types of Super Conductors, BCS theory (Qualitative)	R,U	CO3
	3	Quantum Tunnelling, High Temperature superconductivity, Josephson Junctions (Qualitative), DC and RF SQUIDS (Qualitative),	R,U	CO3
	4	Applications in Quantum Computing: Charge, Phase and Flux qubits, Numerical Problems.	R,U	CO3

### MODULE-5

Week	Days/ Date	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
9	1	Taxonomy of physics based animation methods, Frames, Frames per Second, Size and Scale	R,U,A2	CO4
	2	Weight and Strength, Motion and Timing in Animations, Constant Force and Acceleration,	R,U	CO4
	3	The Odd rule, Odd-rule Scenarios, Motion Graphs, Examples of Character Animation:	R,U	CO4
	4	Jumping, Parts of Jump, Jump Magnification, Stop Time, Walking: Strides and Steps, Walk Timing	R,U	CO4
10	1	Numerical Problems	R,U,E	CO4
	2	Descriptive statistics and inferential statistics, Poisson distribution and modeling the probability of proton decay,	R,U	CO4
	3	Normal Distributions (Bell Curves), Monte Carlo Method: Determination of Value of $\pi$ .	R,U	CO4
	4	Numerical Problems	R,U	CO4

**Bloom's Taxonomy Level :R-Remembering U-Understanding A1-Applying  
A2-Analysing  
E-evaluating C-Creating**

**Suggested Learning Resources:**

**Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)**

1. Solid State Physics, S O Pillai, New Age International Private Limited, 8th Edition, 2018.
2. Engineering Physics by Gupta and Gour, Dhanpat Rai Publications, 2016 (Reprint).
3. A Textbook of Engineering Physics- M.N. Avadhanulu and P.G. Kshirsagar, 10th revised Ed, S. Chand. & Company Ltd, New Delhi.
4. A Textbook of Engineering Physics by M.N. Avadhanulu, P G. Kshirsagar and T V S Arun Murthy, Eleventh edition, S Chand and Company Ltd. New Delhi-110055.
5. Quantum Computation and Quantum Information, Michael A. Nielsen & Isaac L. Chuang, Cambridge Universities Press, 2010 Edition. 26.10.2022 4
6. Quantum Computing, Vishal Sahani, McGraw Hill Education, 2007 Edition.
- 7 Quantum Computing – A Beginner's Introduction, Parag K Lala, Indian Edition, Mc GrawHill, Reprint 2020.
8. Engineering Physics, S P Basavaraj, 2005 Edition, Subhash Stores.
9. Physics for Animators, Michele Bousquet with Alejandro Garcia, CRC Press, Taylor & Francis, 2016.
10. Quantum Computation and Logic: How Quantum Computers Have Inspired Logical Investigations, Maria Luisa Dalla Chiara, Roberto Giuntini, Roberto Leporini, Giuseppe Sergioli, Trends in Logic, Volume 48, Springer.

**Web links and Video Lectures (e-Resources):**

- LASER: <https://www.youtube.com/watch?v=WgzynzPiyC>  
Superconductivity : <https://www.youtube.com/watch?v=MT5Xl5ppn48>  
Optical Fiber : [https://www.youtube.com/watch?v=N\\_kA8EpCUQo](https://www.youtube.com/watch?v=N_kA8EpCUQo)  
Quantum Mechanics : <https://www.youtube.com/watch?v=p7bzE1E5PMY&t=136s>  
Quantum Computing : <https://www.youtube.com/watch?v=jHoEjvuPoB8>  
Physics of Animation : [https://www.youtube.com/watch?v=kj1kaA\\_8Fu4](https://www.youtube.com/watch?v=kj1kaA_8Fu4)  
Statistical Physics Simulation : [https://phet.colorado.edu/sims/html/plinko-probability/latest/plinkoprobability\\_en.html](https://phet.colorado.edu/sims/html/plinko-probability/latest/plinkoprobability_en.html)  
NPTEL Quantum Computing : <https://archive.nptel.ac.in/courses/115/101/115101092>  
Virtual LAB : <https://www.vlab.co.in/participating-institute-amrita-vishwa-vidyapeetham>  
Virtual LAB : <https://vlab.amrita.edu/index.php?sub=1&brch=189&sim=343&cnt=1>

**Activity Based Learning (Suggested Activities in Class)/ Practical Based learning**

- <http://nptel.ac.in>  
<https://swayam.gov.in>  
[https://virtuallabs.merlot.org/vl\\_physics.html](https://virtuallabs.merlot.org/vl_physics.html)  
<https://phet.colorado.edu>  
<https://www.myphysicslab.com>



**Signature of Staff**



**Signature of HOD**



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## Question Bank

Course Name: Applied Physics for CSE Stream

Course Code: BPHYS202

Semester: II

Section: D,E & F

### Module-I

#### Laser and Optical Fibers:

1. Explain the three possible ways through which radiation interacts with matter.
2. Derive the expression for energy density by using Einstein's coefficients.
3. Explain the requisites and conditions to obtain a laser beam.
4. Explain the construction and working of semiconductor laser with energy level diagram.
5. Explain the applications of lasers in
  - a) Bar code
  - b) Laser printer
  - c) Laser cooling
6. What is Numerical Aperture? Derive the expression for Numerical Aperture with a neat diagram.
7. With neat diagrams explain the different types of optical fibers.
8. What is attenuation. Explain the different types of attenuation mechanisms with neat diagrams.
9. Write a note on applications of optical fibers in
  - a) Fiber optic networking
  - b) Point to point communication
10. Mention the advantages and disadvantages of optical fibers in point-to-point communication.





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## Module-II

### Quantum Mechanics:

1. Explain De-Broglie hypothesis and derive the expression for de Broglie wavelength and what are the characteristics of matter waves.
2. Define phase velocity and group velocity and mention the expression for the same.
3. State and explain Heisenberg's uncertainty principle and its physical significance.
4. Using uncertainty principle prove that free electron cannot exist inside the nucleus.
5. What is a wave function and what are the properties of wave function.
6. Explain a) Max-Born interpretation b) Normalization.
7. Derive the expression for time independent Schrodinger wave equation in one dimension.
8. Using the time independent Schrodinger wave equation obtain the solution for normalized wave function.
9. Find eigenvalues and eigen functions for a particle in one dimensional potential well.
10. Discuss the wave function probability densities and eigen energy values for a free particle in a box by considering the ground state and first two excited states.



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## Module-III

### Quantum Computing

1. State and explain Moore's law.
2. Compare classical and quantum information.
3. Mention the differences between classical and quantum computing.
4. What is qubit? Mention the properties of qubits.
5. What is Bloch sphere? Represent the single qubit states  $|0\rangle$  and  $|1\rangle$  on the Bloch sphere.
6. Discuss matrix form of single qubit, two qubit states and n-qubits.
7. Compose identity operator? Show that identity operator operates on the states  $|0\rangle$  and  $|1\rangle$  leaves the same states.
8. Mention the Pauli matrices. Discuss the Pauli matrices operation on  $|0\rangle$  and  $|1\rangle$  states.
9. Explain conjugate and transpose of matrix.
10. What are unitary, row and column matrix? What is the condition for matrix multiplication or inner product? Give one example.
11. What is unitary operator? Show that  $U^\dagger U = U U^\dagger = I$  using the matrix  $A = \begin{bmatrix} \cos\theta & i\sin\theta \\ i\sin\theta & \cos\theta \end{bmatrix}$ .
12. Explain probability, normalisation, quantum superposition, orthogonality and orthonormality.
13. Explain single qubit quantum NOT gate.
14. Mention unitary operator for Pauli X, Y, Z, and Hadamard quantum gates using tensor product or outer product. Explain the operations of Pauli X, Y, Z, and Hadamard quantum gates on  $|0\rangle$  and  $|1\rangle$  states. And represent the input and output states on the Bloch sphere.
15. Obtain unitary operator for S (Swap) gate using rotation unitary operator  $RZ(\varphi) = e^{-i\varphi/2} \cdot \sigma_Z$ . Show that  $T = \sqrt{S}$ .
16. What are two qubit quantum logic gates? Discuss two qubit quantum NOT gate or controlled NOT gate with four different input states.
17. Discuss two qubit quantum S gate or controlled S gate with four different input states.
18. Discuss two qubit quantum Z gate or controlled Z gate with four different input states.
19. What are three qubit quantum logic gates?
20. Discuss Toffoli or controlled controlled NOT or C2NOT gate with all different 8 (eight) input states.



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## Module-IV

### Electrical Properties of Materials and Applications:

1. Explain in brief classical free electron theory of metals.
2. Explain the effect of temperature and impurity on electrical resistivity of metals. (Matheissen's rule)
3. Explain the failures of classical free electron theory. What are the assumptions of quantum free electron theory.
4. Explain fermi factor and variation of fermi factor with temperature with suitable graph.
5. Explain the temperature dependence of resistivity of metals and superconductors.
6. Explain BCS theory of superconductivity and formation of cooper pairs.
7. Explain Meissner's effect with suitable diagram.
8. Explain critical field and temperature dependence of critical field.
9. Explain the different types of superconductors by giving examples of each with suitable graphs.
10. Write a note on high temperature superconductors.
11. Explain quantum tunneling, Josephson junction and its types.
12. What is a SQUID. Explain DC and RF SQUIDS using diagrams.
13. Explain flux quantization with suitable diagram.
14. What are Qubits and explain flux, charge and phase Qubits.



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## Module-V

### Physics of Animation

1. What is animation. Explain frame and frame per second.
2. Explain a) size and scale b) proportion & scale c) weight and strength.
3. Explain motion and timing in animations  
(Linear motion, uniform motion, slow in & slow out)
4. Elucidate constant force and acceleration.
5. Explain the odd rule, odd rule multiplier and odd rule scenarios with examples.
6. Give a brief discussion about motion graphs.
7. Explain jumping and ports of jump in detail.
8. Explain jump magnification and acceleration.
9. Explain the calculation of push time stop time with examples.
10. Elucidate walking and explain strides and steps with neat diagram.
11. Distinguish between descriptive and inferential statistics.
12. Discuss the salient features of normal distribution using bell curves.
13. Mention the general pattern of monte Carlo method and hence determine the value of  $\pi$ .
14. Discuss modelling the probability for proton decay.
15. Explain Poisson distribution & mass function.

**Staff**

**Mr. Dinesh S**

**HOD**

**Mrs. Nagasree G**



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## Assignment Questions

Course Name: Applied Physics for CSE Stream

Course Code: BPHYS202

Semester: II

Section: D,E & F

### Module-I

#### Laser and Optical Fibers:

1. Derive the expression for energy density by using Einstein's coefficients.
2. Explain the requisites and conditions to obtain a laser beam.
3. Explain the construction and working of semiconductor laser with energy level diagram.
4. Explain the applications of lasers in
  - a) Bar code
  - b) Laser printer
  - c) Laser cooling
5. What is Numerical Aperture? Derive the expression for Numerical Aperture with a neat diagram.
6. With neat diagrams explain the different types of optical fibers.
7. What is attenuation. Explain the different types of attenuation mechanisms with neat diagrams.
8. Write a note on applications of optical fibers in
  - a) Fiber optic networking
  - b) Point to point communication



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## Module-II

### Quantum Mechanics:

1. Explain De-Broglie hypothesis and derive the expression for de Broglie wavelength and what are the characteristics of matter waves.
2. State and explain Heisenberg's uncertainty principle and its physical significance.
3. Using uncertainty principle prove that free electron cannot exist inside the nucleus.
4. Explain a) Max-Born interpretation b) Normalization.
5. Derive the expression for time independent Schrodinger wave equation in one dimension.
6. Using the time independent Schrodinger wave equation obtain the solution for normalized wave function.
7. Find eigenvalues and eigen functions for a particle in one dimensional potential well.
8. Discuss the wave function probability densities and eigen energy values for a free particle in a box by considering the ground state and first two excited states.



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## Module-III

### Quantum Computing

1. State and explain Moore's law.
2. Compare classical and quantum information.
3. Mention the differences between classical and quantum computing.
4. What is qubit? Mention the properties of qubits.
5. What is Bloch sphere? Represent the single qubit states  $|0\rangle$  and  $|1\rangle$  on the Bloch sphere.
6. Discuss matrix form of single qubit, two qubit states and n-qubits.
7. Compose identity operator? Show that identity operator operates on the states  $|0\rangle$  and  $|1\rangle$  leaves the same states.
8. Mention the Pauli matrices. Discuss the Pauli matrices operation on  $|0\rangle$  and  $|1\rangle$  states.
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10. What are unitary, row and column matrix? What is the condition for matrix multiplication or inner product? Give one example.
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16. What are two qubit quantum logic gates? Discuss two qubit quantum NOT gate or controlled NOT gate with four different input states.
17. Discuss two qubit quantum S gate or controlled S gate with four different input states.
18. Discuss two qubit quantum Z gate or controlled Z gate with four different input states.



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## Module-IV

### Electrical Properties of Materials and Applications:

1. Explain the failures of classical free electron theory. What are the assumptions of quantum free electron theory.
2. Explain fermi factor and variation of fermi factor with temperature with suitable graph.
3. Explain the temperature dependence of resistivity of metals and superconductors.
4. Explain BCS theory of superconductivity and formation of cooper pairs.
5. Explain Meissner's effect with suitable diagram.
6. Explain critical field and temperature dependence of critical field.
7. Explain the different types of superconductors by giving examples of each with suitable graphs.
8. Write a note on high temperature superconductors.
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10. What is a SQUID. Explain DC and RF SQUIDS using diagrams.
11. Explain flux quantization with suitable diagram.
12. What are Qubits and explain flux, charge and phase Qubits.





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## Module-V

### Physics of Animation

1. What is animation. Explain frame and frame per second.
2. Explain a) size and scale b) proportion & scale c) weight and strength.
3. Explain motion and timing in animations  
(Linear motion, uniform motion, slow in & slow out)
4. Elucidate constant force and acceleration.
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8. Explain jump magnification and acceleration.
9. Explain the calculation of push time stop time with examples.
10. Elucidate walking and explain strides and steps with neat diagram.
11. Distinguish between descriptive and inferential statistics.
12. Discuss the salient features of normal distribution using bell curves.
13. Mention the general pattern of monte Carlo method and hence determine the value of  $\pi$ .

**Staff**  
**Mr. Dinesh S**

**HOD**  
**Mrs. Nagasree G**



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**CITY ENGINEERING COLLEGE**  
**First Internal Test**

**Course: Physics for CSE Stream**  
**Subject Code: BPHYS202**  
**Programme: CS/IS Branch, Sem: II<sup>nd</sup> & Sec: D, E, F**

**Date: 16/05/2024**  
**Time: 10.00AM-11.00AM**  
**Max. Marks: 25**

Q.No	ANSWER ALL QUESTIONS	Marks	CO'S	BT Level
<b>PART-A</b>				
1	Derive the expression for energy density by using Einstein's Coefficients.	5	CO1	BT2
<b>OR</b>				
2	The ratio of population inversion of two energy levels is $1.059 \times 10^{-30}$ Find the wavelength of Light emitted by spontaneous emissions at 330K.	5	CO1	BT5
<b>PART-B</b>				
3	Explain the Construction and working of Semiconductor laser.	5	CO1	BT4
<b>OR</b>				
4	Derive the expression for numerical aperture with neat diagram.	5	CO1	BT2
<b>PART-C</b>				
5	What is attenuation. Explain the different types of attenuation with neat diagrams.	5	CO1	BT1
<b>OR</b>				
6	The angle of acceptance of an optical Fiber is $30^\circ$ , when kept in air. Find the angle of acceptance when it is in a medium of refractive index 1.33.	5	CO1	BT5
<b>PART-D</b>				
7	Explain Heisenberg's uncertainty principle and prove that the free electron does not exist inside the nucleus.	5	CO2	BT3
<b>OR</b>				
8	Explain the odd rule, odd rule multiplier, odd rule Scenarios with examples.	5	CO4	BT4
<b>PART-E</b>				
9	Derive the expression for time independent schrodinger's wave equation in one dimension.	5	CO2	BT2
<b>OR</b>				
10	A particle of mass $0.5 \text{ meV}/c^2$ has kinetic energy 100eV. Find its de-Broglie wavelength, where 'C' is the velocity of light.	5	CO2	BT5



## **Course Outcomes: -**

**CO1--Describe the principles of Laser and optical fibers and their relevant application.**

**CO2--Discuss the basic principles of the Quantum mechanics and its applications.**

**CO3--Summarize the essential properties of superconductors and its applications in qubits.**

**CO4--Illustrate the application of physics in design and data analysis.**

**CO5--Practice working in groups to conduct experiments in physics and perform precise and honest measurements.**

## **Bloom's Taxonomy Level:**

**BT1—Remembering BT2---Understanding BT3---Applying BT4---Analyzing BT5----  
Evaluating BT6 ---Creating**

CITY ENGINEERING COLLEGE  
DEPARTMENT OF Applied Physics

SCHEME FOR VALUATION

Internal Test I

Semester & Section: IIud / D, E, F

Date: 16/5/2024

Question No.	Details of the answer	Marks Distribution	Total Marks
①	<p><u>Part - A</u></p> <p>Three cases Explanation</p> <p>Case (i) arrive upto Rate of absorption <math>\propto N_1 \nu_d</math> <math>= B_{12} N_1 \nu_d</math></p> <p>Case (ii) Rate of Spontaneous Emission <math>\propto N_2</math> <math>= A_{21} N_2</math></p> <p>Case (iii) Rate of Stimulated Emission <math>\propto N_2 \nu_d</math> <math>= A_{21} N_2 \nu_d</math></p> <p>W.K.T A/c to thermal equilibrium <math>B_{12} N_1 \nu_d = A_{21} N_2 + B_{21} N_2 \nu_d</math></p> <p>and arrive upto <math>\nu_d = \frac{A}{B(e^{h\nu_d/kT} - 1)}</math></p>	3M	5M
②	<p>Given - <math>\frac{N_2}{N_1} = 1.059 \times 10^{-30}</math></p> <p><math>T = 330 \text{ K}</math></p> <p><math>\lambda = ?</math></p> <p>W.K.T <math>\frac{N_2}{N_1} = e^{-\Delta E/kT} = e^{-\frac{hc}{\lambda kT}}</math></p> <p><math>\lambda = \frac{hc}{kT \ln \left( \frac{N_1}{N_2} \right)} = 632 \text{ nm}</math></p>	2M	5M
		3M	

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16/5/24

CITY ENGINEERING COLLEGE

DEPARTMENT OF .....

SCHEME FOR VALUATION

Internal Test .....

Semester & Section

Date:

Question No.	Details of the answer	Marks Distribution	Total Marks
<p>(3)</p>	<p style="text-align: center;"><u>Part - B</u></p> <p>Construction a working diagram a explanation arrive upto</p> $E_g = hf = \frac{hc}{\lambda}$ $\lambda = \frac{hc}{E_g} = 8400 \text{ \AA}$ <p>where <math>E_g = 1.4 \text{ eV}</math></p> <p style="text-align: center;">(2)</p>	<p>2M</p> <p>3M</p>	<p>5M</p>
<p>(4)</p>	<p>Diagram and explanation for it by applying snells law</p> $n_0 \sin \theta_0 = n_1 \sin \theta_1$ <p>arrive up to</p> $\sin \theta_0 = \sqrt{n_1^2 - n_2^2}$ $N.A = \sqrt{n_1^2 - n_2^2}$ <p>and <math>\sin \theta_1 &lt; N.A</math></p> <p style="text-align: center;"><u>Part - c</u></p>	<p>2M</p> <p>2M</p> <p>1M</p>	<p>5M</p>
<p>(5)</p>	<p>Explain Attenuation with three different mechanisms with suitable diagrams</p>	<p>2M</p> <p>2M</p> <p>1M</p>	<p>5M</p>

Staff *D. P. S.*

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CITY ENGINEERING COLLEGE  
DEPARTMENT OF Applied Physics

SCHEME FOR VALUATION

Internal Test I

Semester & Section: 2nd / D, E, F

Date: 16/05/2024

Question No.	Details of the answer	Marks Distribution	Total Marks
(6)	<p style="text-align: center;">(8)</p> <p>Given = <math>\theta_0 = 30^\circ</math>  <math>n_0' = 1.33</math>                      find - <math>\theta_0' = 1.33</math></p> <p>w.k.t <math>\sin \theta_0 = \frac{\sqrt{n_1^2 - n_2^2}}{n_0'}</math></p> <p><math>\sin \theta_0' = \frac{\sqrt{n_1^2 - n_2^2}}{n_0'}</math></p> <p>arrive at <math>\theta_0' = 22^\circ</math></p> <p style="text-align: center;"><u>Post - D</u></p>	2M  2M  1M	5M
(7)	<p>Heisenberg uncertainty principle statement with expression</p> <p>arrive upto <math>\Delta x \Delta p_x \geq \frac{h}{4\pi}</math></p> <p>w.k.t <math>\Delta x \leq 10^{-14} \text{ m}</math></p> <p>and arrive <math>E \geq 85 \text{ MeV}</math></p> <p>with conclusion</p>	2M  2M  1M	5M

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CITY ENGINEERING COLLEGE

DEPARTMENT OF .....

SCHEME FOR VALUATION

Internal Test .....

Semester & Section

Date:

Question No.	Details of the answer	Marks Distribution	Total Marks
8	<p>(8M)</p> <p>odd rule, odd rule multiplier                      odd rule scenarios explanation                      with examples</p>	<p>2 M                      2 M                      1 M</p>	<p>5M</p>
9	<p><u>Post-E</u></p> <p>w.k.t <math>\psi = A e^{i(kx - \omega t)}</math> <math>\lambda = \frac{h}{p}</math></p> <p>arrive up to <math>\frac{d^2\psi}{dx^2} = -\omega^2\psi</math> 1</p> <p>w.k.t T.E = K.E + P.E</p> <p>and arrive up to</p> <p><math>\frac{d^2\psi}{dx^2} + \frac{8.9 \times 10^{-18} \text{ J}}{h^2} (E - V) \psi = 0</math></p>	<p>1M                      2M                      2M</p>	<p>5M</p>
10	<p>(a)</p> <p><u>Given</u> <math>m = 0.5 \text{ MeV}/c^2</math>  <math>E = 100 \text{ eV}</math>  <math>\lambda = ?</math></p> <p>w.k.t <math>\lambda = \frac{h}{\sqrt{2mE}} = 1.24 \text{ \AA}</math></p>	<p>1M                      2+2M</p>	<p>5M</p>

Staff *S. S. S.*

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 10016/5/2



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**CITY ENGINEERING COLLEGE**  
**Second Internal Test**

**Course: Physics for CSE Stream**  
**Subject Code: BPHYS202**  
**Programme: CS/IS Branch, Sem: II<sup>nd</sup> & Sec: D, E, F**

**Date: 25/06/2024**  
**Time:10.30AM-11.30AM**  
**Max. Marks: 25**

Q.No	ANSWER ALL QUESTIONS	Marks	CO'S	BT Level
<b>PART-A</b>				
1	Explain Fermi Factor and variation of Fermi Factor with temperature with suitable graph.	5	CO3	BT4
<b>OR</b>				
2	Calculate the probability of an electron occupying an energy level 0.02 eV above the fermi level at 200 K and 400 K in a material.	5	CO3	BT5
<b>PART-B</b>				
3	Explain Meissner effect with suitable Diagrams.	5	CO3	BT2
<b>OR</b>				
4	Lead has a superconducting transition temperature of 7.26 K. If initial field at 0K is $50 \times 10^3 \text{ Am}^{-1}$ , calculate the critical field at 6 K.	5	CO3	BT5
<b>PART-C</b>				
5	What is SQUID. Explain DC & RF SQUID using diagram.	5	CO3	BT2
<b>OR</b>				
6	State and explain Moore's law.	5	CO2	BT2
<b>PART-D</b>				
7	Discuss the Pauli X, Y and Z gates and their operation with truth table.	5	CO2	BT4
<b>OR</b>				
8	Given $A = \begin{bmatrix} 0 & -i \\ i & 0 \end{bmatrix}$ , Prove that $A^\dagger = -A$	5	CO2	BT5
<b>PART-E</b>				
9	Explain C-NOT gate, SWAP gate.	5	CO2	BT3
<b>OR</b>				
10	Show that S gate can be formed by connecting two T gate in series.	5	CO2	BT5





**Course Outcomes: -**

**CO1--Describe the principles of Laser and optical fibers and their relevant application.**

**CO2--Discuss the basic principles of the Quantum mechanics and its applications.**

**CO3--Summarize the essential properties of superconductors and its applications in qubits.**

**CO4--Illustrate the application of physics in design and data analysis.**

**CO5--Practice working in groups to conduct experiments in physics and perform precise and honest measurements.**

**Bloom's Taxonomy Level:**

**BT1—Remembering BT2---Understanding BT3---Applying BT4---Analyzing BT5----  
Evaluating BT6 ---Creating**

CITY ENGINEERING COLLEGE  
DEPARTMENT OF Physics  
SCHEME FOR VALUATION  
Internal Test II

Semester & Section IIud & D/E/F

Date: 25/06/2024

Question No.	Details of the answer	Marks Distribution	Total Marks
	<u>Part - A</u>		
1)	Fermi factor explanation Graph & expression Three cases explanation	2M 1M 2M	5M
	(OR)		
2)	Data - $E - E_F = 0.02 \text{ eV}$ $= 0.02 \times 1.6 \times 10^{-19} \text{ J}$ to find - $f(E)$ at $200 \text{ K} = ?$ $f(E)$ at $400 \text{ K} = ?$ W.K.T $f(E) = \frac{1}{e^{(E - E_F)/kT} + 1}$ $f(E)_{200 \text{ K}} = 0.24$ $f(E)_{400 \text{ K}} = 0.36$	1M 2M 2M	5M
	<u>Part - B</u>		
3)	Meissner effect statement diagrams with suitable explanation	1M 2M 2M	5M

Staff

GA  
25/6/24

CITY ENGINEERING COLLEGE

DEPARTMENT OF Physics

SCHEME FOR VALUATION

Internal Test II

Semester & Section IIud X D/E/F

Date 25/6/2024

Question No.	Details of the answer	Marks Distribution	Total Marks
④	<p>(8)</p> <p>Given - <math>T_c = 7.26 K</math></p> <p><math>H_0 = 50 \times 10^3 A/m</math></p> <p>Find - <math>H_c = ?</math> at <math>T = 6K</math></p> <p>W.K.T <math>H_c = H_0 \left(1 - \frac{T}{T_c}\right)</math></p> <p><math>= 15.834 \times 10^3 A/m</math></p>	<p>1M</p> <p>2M</p> <p>2M</p>	5M
⑤	<p><u>Part - c</u></p> <p>SQUID explanation</p> <p>Explain DC &amp; RF SQUID with suitable diagrams</p>	<p>1M</p> <p>2M</p> <p>2M</p>	5M
⑥	<p>(3)</p> <p>Moore's law statement</p> <p>Diagram &amp; Graph with table</p> <p>Explanation</p>	<p>1M</p> <p>2M</p> <p>2M</p>	5M
⑦	<p><u>Part - d</u></p> <p>Pauli's x, y and z gates</p> <p>Explanation with truth table</p>	<p>3M</p> <p>2M</p>	5M

Staff

*[Signature]*

*[Signature]*  
25/6/24

## CITY ENGINEERING COLLEGE

DEPARTMENT OF Physics

SCHEME FOR VALUATION

Internal Test II

Semester &amp; Section

III / D.E.C.FDate: 25/6/24

Question No.	Details of the answer	Marks Distribution	Total Marks
8	<p>(2)</p> <p>Given <math>A = \begin{bmatrix} 0 &amp; -i \\ i &amp; 0 \end{bmatrix}</math></p> <p>To prove <math>A^\dagger = A</math></p> <p><math>A^\dagger = (A^*)^T</math></p> <p><math>A^* = \begin{bmatrix} 0 &amp; i \\ -i &amp; 0 \end{bmatrix}</math></p> <p><math>(A^*)^T = \begin{bmatrix} 0 &amp; -i \\ i &amp; 0 \end{bmatrix} = A</math></p> <p><math>\therefore A^\dagger = A =</math></p> <p><u>Post - E</u></p>	<p>1M</p> <p>2M</p> <p>2M</p>	5M
9	<p>c-NOT explanation with matrix representation and truth table with two different inputs, explanation of swap gate with matrix representation and truth table</p>	<p>3M</p> <p>2M</p>	5M

Staff



31  
25/6/24

100

CITY ENGINEERING COLLEGE

DEPARTMENT OF Physics

SCHEME FOR VALUATION

Internal Test II

Semester & Section: III | D, E, F

Date: 25/01/24

Question No.	Details of the answer	Marks Distribution	Total Marks
<p>(10)</p>	<p>(31)</p> <p>show that <math>S = T^2</math></p> <p>where <math>T = \begin{bmatrix} 1 &amp; 0 \\ 0 &amp; \frac{1+i}{\sqrt{2}} \end{bmatrix}</math></p> <p><math>\therefore S = \begin{bmatrix} 1 &amp; 0 \\ 0 &amp; 1 \end{bmatrix}</math></p>	<p>1M</p> <p>2M</p> <p>2M</p>	<p>5M</p>

Staff Sah

CS  
25/01/24  
HOD

Year : 2023-2024

Semester : Odd / Even ✓

Name of the Teacher : Mrs. Nagashree. G, Dinesh

Designation : Asst. Prof

Department : Physics

Sem/Branch	Subject Code	Subject
1. Ind/cs	BPHYS202	Applied Physics
2.		
3.		

	Initials at the End of the			
	1st Month	2nd Month	3rd Month	Semester
Staff	<del>GA</del> 28/3/24	<del>GA</del> 29/4/24	<del>GA</del> 28/6/24	<del>GA</del> 2nd Sem
HOD	<del>GA</del> 28/3/24	<del>GA</del> 29/4/24	<del>GA</del> 28/6/24	<del>GA</del> 2nd Sem
Principal	SKanban		SKanban	

# ATTENDANCE

Sl. No.	Reg. No.	Name	18	19	20	21	22	23	24	25	26	27	28	29	30	31
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			1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	ICE23CS001	Achuta S	1	1	2	3	4	5	6	7	8	9	10	11	12	13
2	003	Adithya KM	1	2	3	3	4	5	5	6	6	7	8	9	10	11
3	004	Adithya S	1	2	3	4	5	6	7	8	9	10	11	12	13	14
4	005	Abnan Pasha	1	2	3	4	5	6	7	8	9	10	11	12	13	14
5	006	Ajay K S	1	2	3	3	4	5	6	7	8	9	10	11	12	13
6	007	Akash C P	1	1	2	2	3	4	5	5	5	5	6	7	8	9
7	008	Akash J Gowda	1	2	3	3	4	5	6	6	6	6	7	8	9	10
8	009	Akashraj V T	1	1	1	1	2	2	2	3	4	5	6	7	8	9
9	010	Akhilesh	1	1	2	2	2	2	2	2	3	4	5	6	7	8
10	011	Anna Narayana N C	1	1	2	2	3	4	5	6	6	6	7	8	9	10
11	012	Anagha N	1	1	2	3	4	5	6	7	8	9	10	11	12	13
12	013	Anitha K	1	2	3	4	5	6	7	8	9	10	11	12	13	14
13	014	Anjan P	1	1	2	3	4	5	6	6	6	7	8	9	10	11
14	015	Ankitha	1	1	2	2	3	4	5	6	7	8	9	10	11	12
15	016	Arusha A	1	2	2	2	3	4	5	6	7	7	8	9	10	11
16	017	Asyan tiwari	1	1	2	3	4	5	6	7	8	9	10	11	12	13
17	018	Asha P	1	2	3	3	4	4	4	4	5	6	7	8	9	10
18	019	Ashutosh B chazekar	1	2	3	4	5	6	7	8	9	9	10	11	12	13
19	020	Ayush Upadhyay	1	2	3	4	5	5	6	6	6	7	8	9	10	11
20	021	Bhevan	1	2	2	2	3	3	4	4	5	5	6	7	8	9
21	022	Bhavara N S	1	2	3	4	5	6	7	8	9	10	11	12	13	14
22	023	Bhavani	0	1	2	3	4	5	6	7	8	9	10	11	12	13
23	024	Bhoomika P	1	1	1	1	1	2	3	4	5	6	7	8	9	10
24	025	Bhumika Babaganur	1	1	2	3	4	5	6	7	8	9	10	11	12	13
25	026	Bindu T	1	1	2	3	4	5	6	7	8	9	10	11	12	13
No. of Absents																
Initials																

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# ATTENDANCE

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			1	2	3	4	5	6	7	8	9	10	11		
26	027	Bindushree K M	1	1	2	3	3	4	5	6	7	7	8		
27	028	C.H. Harikishan Reddy	1	1	2	2	3	3	4	5	5	6	7		
28	029	Chandan D R	1	1	2	2	3	4	4	4	4	4	4		
29	030	Chandana Y	1	1	2	3	4	5	6	7	8	9	10		
30	031	Chandakanth Y	1	2	2	2	2	2	2	2	2	2	3		
31	032	Chaxen G	1	2	3	4	5	6	7	8	9	10	11		
32	033	Chaitra C	1	2	3	4	5	6	7	8	9	10	11		
33	034	Chetan B N	1	1	2	2	3	3	3	3	3	3	4		
34	035	Chethana S Y	1	2	3	4	5	6	7	8	9	10	11		
35	036	Chinmayi P N	1	2	3	4	5	6	7	8	9	9	10		
36	037	D M Manya	1	2	3	4	5	6	7	8	9	10	11		
37	038	Dandu Venkata Sai	1	2	3	3	3	4	4	5	5	6	6		
38	039	Dasha V	1	1	2	2	2	3	3	3	4	5	5		
39	040	Dasshan B S	1	2	3	4	5	6	7	8	9	10	11		
40	041	Dasshan C	1	1	2	3	4	5	6	7	8	9	9		
41	042	Dasshan Gaurda M	1	1	2	2	3	4	4	5	6	6	7		
42	045	Deepika E	1	2	3	4	5	6	7	8	9	10	11		
43	046	Deepika S J	1	1	2	3	4	5	6	7	8	9	10		
44	048	Dinesh C	1	2	3	4	5	6	7	8	9	10	11		
45	049	Divya	1	1	2	3	4	5	6	7	8	9	10		
46	051	Evans J	1	2	3	3	4	5	6	7	8	9	10		
47	053	Feroz Ahmed	1	2	2	2	3	3	3	4	5	6	6		
48	054	Gagan D C	1	2	2	2	3	3	4	5	6	7	8		
49	055	Gvindaraju S N	1	1	2	2	3	3	3	4	4	5	6		
50	056	Hari R	1	1	2	2	3	4	4	5	6	7	8		
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		Initials													

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# ATTENDANCE

Sl. No.	Reg. No.	Name	11	18	20	20	21	21	22	22	23	1	3
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			1	2	3	4	5	6	7	8	9	10	11
51	P 057	Haqshith L	1	2	2	2	3	4	5	6	7	7	8
52	058	Haqshitha M	1	1	2	3	4	4	4	5	6	7	8
53	060	Hemanth A N	1	2	2	3	4	4	5	5	5	6	
54	P 062	Indu	1	2	3	4	4	5	6	7	8	9	10
55	064	Jeevan T	1	1	1	1	1	2	3	3	3	3	3
56	066	Kallesh H V	1	1	1	2	3	4	4	5	5	6	7
57	069	Keerthi S	1	1	1	1	2	3	4	5	6	7	8
58	P 070	Keshav G K	1	1	2	3	4	5	6	6	7	8	9
59	073	Kushmittha P	1	1	1	1	2	3	4	5	6	7	8
60	P 075	Lekshitha D B	1	2	3	4	5	6	7	8	9	10	11
61	076	Lekhana D R	1	1	2	3	4	5	6	7	8	9	10
62	077	Iepaksh S Gujar	1	1	2	2	3	4	4	5	6	7	8
63	P 078	Likhitha C	1	2	3	4	5	6	7	8	9	10	11
64	P 079	Likhitha R K	1	2	2	3	4	4	4	5	6	7	8
65	P 080	M. Kishore	1	1	2	3	4	5	6	7	8	9	10
66	081	M. Mohd. Hameem	1	2	3	4	5	6	6	7	8	9	10
67	082	Madhumitha S	1	2	3	4	5	6	7	8	9	10	11
68	090	Mohd. Faizan	1	1	1	1	1	2	2	2	2	2	3
69	CS136	Ravichandran V	1	1	1	1	2	2	2	2	3	3	4
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No. of Absents													
Initials													

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# CITY ENGINEERING COLLEGE

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Doddakallasandra, Off Kanakapura Main Road,  
Next to Gokulam Apartment, Bangalore - 560 062.



**DEPARTMENT OF APPLIED SCIENCE & HUMANITIES**  
**ACADEMIC YEAR 23-24 ODD SEMESTER**  
**CIRCULAR**

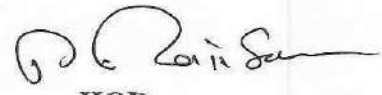
Ref No: CEC/S&H/DAC/ACY 2023-24/OR/01

Date: 06-09-2023

This is to inform the members of Department Advisory Committee that meeting is scheduled on 08-09-2023 at 11: 00 AM in Physics Laboratory.

**Agenda:**

- Commencement of classes for 1<sup>st</sup> semester students
- Phase I Student Induction Programme for 1<sup>st</sup> semester students
- Conduction of Talents day
- Organizing value added courses/ circular courses in the curriculum
- Organizing Ramanujam Day on 13/12/2023
- Organizing sports exclusively for 1<sup>st</sup> semester students

  
HOD

Dr. Rajasekhara P  
**Dr. P. RAJASEKHAR,**  
M.Sc. M.Phil. Ph.D  
HEAD OF THE DEPT. OF CHEMISTRY  
CITY ENGINEERING COLLEGE,  
Doddakallasandra, Kanakapura Main Road  
BANGALORE - 560 062.  
Ph (O) 26668313 (M) 92428 92734



# CITY ENGINEERING COLLEGE

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Next to Gokulam Apartment, Bangalore - 560 062.



## DEPARTMENT OF APPLIED SCIENCE & HUMANITIES

### Department Advisory Committee Meeting

**Date: 08-09-2023**

**Time: 11:00 AM**

**Venue: Physics Laboratory**

#### List of DAC Members

Sl. No	Member Name	Designation	Role	Signature
1	Dr. Rajasekhar. P	HOD & Professor	Convenor	
2	Dr. Jyothi. P	HOD & Professor	Member	
3	Mrs. Nagasree. G	Assistant Professor	Member	
4	Dr. Sunitha. N	Associate Professor	Member	
5	Mrs. Vanitha. G .R	Assistant Professor	Member	
6	Mr. Rekha. R	Assistant Professor	Member	
7	Mrs. Anitha. C. V	Assistant Professor	Member	
8	Ms. Janavi. R	Assistant Professor	Member	
9	Ms. Bhavitha. B. G	Assistant Professor	Member	
10	Ms. Meghana.. D	Assistant Professor	Member	
11	Mrs. Swaroopini B S	Assistant Professor	Member	
12	Mr. Sadashiva. R	Assistant Professor	Member	
13	Mr. Dinesh	Assistant Professor	Member	
14.	Pallagolla Dwarakesh	VM WARE, Bangalore 9611250471	Member	
15.	Abhilash M	Alumini, Attebele 8971787473	Member	

#### Agenda of the Meeting:

- Commencement of classes for 1<sup>st</sup> semester students
- Phase I Student Induction Programme for 1<sup>st</sup> semester students
- Conduction of Talents day
- Organizing value added courses/ circular courses in the curriculum
- National Mathematics Day is celebrated on 22 December to mark the birth anniversary of legendary Indian mathematician, Srinivasa Ramanujan as to be celebrated as Ramanujam Day on 13/12/2023 and organising an oral quiz on it.
- Organizing sports exclusively for 1<sup>st</sup> semester students.



# CITY ENGINEERING COLLEGE

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Doddakallasandra, Off Kanakapura Main Road,  
Next to Gokulam Apartment, Bangalore - 560 062.



## Minutes of Meeting:

The members discussed suggestions for improvement and reviewed the meeting agenda.

- The HOD emphasized the importance of societal projects and the need to find opportunities for such initiatives.
- The committee decided to organize value added course on Leadership and Management
- It was proposed to conduct Ramanujam Day on 13/12/2023 to mark the birth anniversary of legendary Indian mathematician, Srinivasa Ramanujan.
- It was discussed to conduct Talents day and sports day.

  
Convenor

Dr. Rajasekhar. P

**Dr P. RAJASEKHAR,**

M.Sc; M.Phil; Ph.D

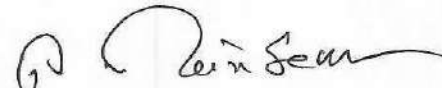
HEAD OF THE DEPT. OF CHEMISTRY

CITY ENGINEERING COLLEGE

Doddakallasandra, Kanakapura Main Road

BANGALORE - 560 062

Ph (O) 26669313 (M) 92428 92734

  
HOD

Dr. Rajasekhar P

**Dr P. RAJASEKHAR,**

M.Sc; M.Phil; Ph.D

HEAD OF THE DEPT. OF CHEMISTRY

CITY ENGINEERING COLLEGE

Doddakallasandra, Kanakapura Main Road

BANGALORE - 560 062.

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# ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ

("ವಿ ಜಿ ಯು ಅಧಿನಿಯಮ ೧೯೯೪" ರ ಅಡಿಯಲ್ಲಿ ಕರ್ನಾಟಕ ಸರ್ಕಾರದಿಂದ ಸ್ಥಾಪಿತವಾದ ರಾಜ್ಯ ವಿಶ್ವವಿದ್ಯಾಲಯ)

## VISVESVARAYA TECHNOLOGICAL UNIVERSITY

(State University of Government of Karnataka Established as per the VTU Act, 1994)

"JnanaSangama" Belagavi-590018, Karnataka, India

Prof. Dr. B. E. Rangaswamy, Ph.D.  
REGISTRAR

Phone: (0831) 2498100  
Fax : (0831) 2405467

REF: VTU/BGM/ACA/2023-24/ 3342

DATE: 5 OCT 2023

### Revised-NOTIFICATION

- Subject:** Tentative Academic Calendar of 1st semesters of B.E./B.Tech./B.Arch./B.Plan., and VII semester of B.E./B.Tech., programs of University regarding...
- Reference:** Dean faculty of Engineering, VTU Belagavi approval dated 24.08.2023  
Hon'ble Vice-Chancellor's approval dated: 24.08.2023

The tentative academic calendar concerned to 1st semesters of B.E./B.Tech./B.Arch./B.Plan., and VII semester of B.E./B.Tech., programs of University for academic year 2023-24 are hereby notified as mentioned below;

	I semester B.E./B.Tech (2022 scheme)	I semester B.Plan/B.Arch (2021 scheme)	VII semester B.E./B.Tech (2018 scheme)
Commencement of the Semester	04.09.2023	04.09.2023	14.08.2023
# Internship/Students Induction Program	04.09.2023 To 14.09.2023	04.09.2023 To 14.09.2023	14.08.2023 To 09.09.2023
Commencement of Classes	15.09.2023	15.09.2023	11.09.2023
Last Working day of the Semester	06.01.2024	06.01.2024	06.01.2024
Practical Examination	08.01.2024 To 19.01.2024	08.01.2024 To 19.01.2024	08.01.2024 To 19.01.2024
Theory Examinations	22.01.2024 To 17.02.2024	22.01.2024 To 17.02.2024	22.01.2024 To 09.02.2024
Commencement of NEXT Semester	19.02.2024	19.02.2024	13.02.2024

# Internship for VI semester completed students and Students Induction Program for 1<sup>st</sup> semester Students

#### Please Note:

- The academic sessions for ODD semesters should commence on the **date mentioned** above.

**\*\* Induction Program** shall be conducted for 11 days at the beginning of 1<sup>st</sup> semester and 10 days at the beginning of the 2<sup>nd</sup> semester. During the induction program, college has to brief about the new curriculum that implemented from the academic year 2022-23.

- If required, the college can plan to have extra classes on 1<sup>st</sup> and 3<sup>rd</sup> Saturday and Sundays to complete academic activities within the duration mentioned.
- The faculty/staff shall be available to undertake any work assigned by the university.
- Notification regarding the Calendar of Events relating to the conduct of University **Examinations** will be issued by the Registrar (Evaluation) from time to time.
- Academic Calendar **may be modified** based on guidelines/directions issued in the future by UGC/AICTE/State Government.
- Academic Calendar is also applicable for **Autonomous Colleges**. If any changes are to be effected by Autonomous Colleges in the academic terms and examination schedule, they could do so with the approval of the University.
- The circular related to AICTE Activity point will be issued by the Registrar's office separately.
- If any suggestions/clarification/correction, please email to -[sbhvtuso@yahoo.com](mailto:sbhvtuso@yahoo.com)

The Principals of Affiliated, Constituent and Autonomous Engineering Colleges, Chairpersons of the University departments are hereby informed to bring the academic calendar to the notice of all concerned.

Sd/-

REGISTRAR

To,

1. The Principals of all affiliated/ constituent /Autonomous Engineering Colleges under the ambit of VTU Belagavi.
2. The chairperson, of the Department of Mechanical Engineering /Civil Engineering /Computer Science and Engineering& Communication Electronics Engineering of the University.

Copy to.

1. To the Hon'ble Vice-Chancellor through the secretary to VC, VTU Belagavi for information
2. The Registrar (Evaluation), VTU Belagavi for information.
3. The Regional Directors (I/c) of all the regional offices of VTU for circulation.
4. The Director I/c. ITI SMU, VTU Belagavi for information and to make arrangements to upload Academic Calendar on the VTU web portal.
5. The Director of Physical Education, VTU Belagavi for information
6. The Director, Central Placement Cell, VTU Belagavi for information
7. The Special Officer Library, VTU Belagavi for information
8. OS for information and make arrangements to send the circular regarding AICTE Activity Points
9. All the concerned Special Officer/s and Caseworker/s of the academic section, VTU, Belagavi

Rav 05/10/23 BE

REGISTRAR

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**CITY ENGINEERING COLLEGE, BENGALURU-560061. ACADEMIC CALENDAR 2023-24 Odd SEM Revised on 25/10/2023**

OCT 2023		NOV 2023		DEC 2023		JAN 2024		FEB 2024		March 2024		April 2024				
DAY	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT		
SUN	1															
MON	2	GANDHI JAYANTHI					1	II test for I st sem , III test for VII sem , I st test V sem, & III sem					1	Start of 4th sem		
TUE	3						2							2		
WED	4		1	RAJYOTSAVA DAY			3							3		
THU	5		2				4		1				4			
FRI	6		3		1		5		2		1		5			
SAT	7	1st Saturday holiday	4	1st Saturday holiday	2	1st Saturday holiday	6	Last Working day I & 7	3	1st Saturday holiday	2	1st Saturday holiday	6	1st Saturday holiday		
SUN	8		5		3		7		4		3		7			
MON	9		6	I st test I sem and VII sem	4	II nd test VII sem,	8	Practical Exam I, 7	5	2nd test 3 <sup>rd</sup> sem V sem,	4	III test for V sem , Start of theory 3 <sup>rd</sup>	8			
TUE	10		7		5		9		6				5		9	Ugadhi, Ramzan
WED	11		8		6		10		7				6		10	
THU	12		9		7		11		8				7		11	
FRI	13		10		8		12		9				8		12	Maha Shivarathri
SAT	14	MAHALAYA AMAVASA	11		9		13		10		9	Last working day-5th	13			
SUN	15		12		10		14		11		10		14			
MON	16		13		11		15	Sankranthi	12		11	Start of practical 5th	15			
TUE	17		14	BALIPADYAMI	12		16		13	Start of 8th sem	12		16			
WED	18		15	Start of 3rd sem	13		17		14		13		17			
THU	19		16		14		18		15		14		18			
FRI	20		17		15		19		16		15		19			
SAT	21	3rd Saturday holiday	18	3rd Saturday holiday	16	3rd Saturday holiday	20	3rd Saturday holiday	17	3rd Saturday holiday	16	3rd Saturday holiday	20	3rd Saturday holiday		
SUN	22		19		17		21		18		17		21			
MON	23	AYUDHA POOJA	20		18		22	THEORY EXAM I & 7	19	Start of 2 <sup>nd</sup> sem	18		22	Start of 6th sem		
TUE	24	VIJAYA DASHAMI	21		19		23		20	Last working day-3rd	19		23			
WED	25	Start of 5th sem INTERNSHIP	22		20		24		21	Start of practical 3rd	20		24			
THU	26		23		21		25		22		21		25			
FRI	27		24		22		26	Republic day	23		22	Start of theory 5th	26			
SAT	28	VALMIKI JAYANTHI	25	Start of 5th sem class	23		27		24		23		27			
SUN	29		26		24		28		25		24		28			
MON	30		27		25	CHRISTMAS	29		26		25	Holi	29			
TUE	31		28		26		30		27		26		30			
WED			29		27		31		28		27					
THU			30	KANAKADASA JAYANTHI	28				29		28					
FRI					29						29	Good Friday				
SAT					30						30					
SUN					31						31					



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**ACADEMIC YEAR: 2023-24**

## DEPARTMENT OF APPLIED SCIENCE & HUMANITIES

### COURSE PREFERENCE

Name of the Faculty: Dr. Sujatha K

Designation: Professor and HOD

Sl. No	Course Code and Name	Year/Semester
1.	BPHYS102 Applied Physics for EEE Scheme For C sections	2024/I

**HOD**

**Department of Physics**

**Signature of Faculty**

**Department of Physics**





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**ACADEMIC YEAR: 2023-24**

## **DEPARTMENT OF APPLIED SCIENCE & HUMANITIES**

### **COURSE PREFERENCE**

Name of the Faculty: Mrs. Nagasree G

Designation: Assistant Professor

Sl. No	Course Code and Name	Year/Semester
1.	BPHS102 Applied Physics for Computer Science & Engineering Scheme For A, B section	2024/I

**HOD**

**Department of Physics**

**Signature of Faculty**

**Department of Physics**



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**ACADEMIC YEAR: 2023-24**

## **DEPARTMENT OF APPLIED SCIENCE & HUMANITIES**

### **COURSE PREFERENCE**

Name of the Faculty: Mr. Dinesh S

Designation: Assistant Professor

Sl. No	Course Code and Name	Year/Semester
1.	BPHYS102 Applied Physics for Computer Science & Engineering Scheme - Laboratory	2024/I

**HOD**

**Department of Physics**

**Signature of Faculty**

**Department of Physics**

**CITY ENGINEERING COLLEGE**  
**TIME TABLE –FIRST SEMESTER SEPTEMBER – 2023-24**  
**PHYSICS CYCLE**

**SECTION: A**

**BRANCH: AI&ML**

**ROOM NO: A007**

DAY	9:00-10:00	10:00-11:00	11:00-11:15	11:15 -12:15	12:15-1:15	1:15-2:00	2:00-3:00	3:00-4:00	4:00-5:00
MON	BETCK105H	BPHYS102	<b>BREAK</b>	BMATS101	BKSKK107	<b>LUNCH</b>	←---PHYL/POPL/MATL /A1/A2/A3---→		
TUE	BMATS101	←PHYL/		POPL /MATL /A2/A3/A1→					
WED	BPHYS102	BETCK105H		BPOPS103	BENGGK106		←---PHYL/POPL/MATL /A3/A1/A2---→		
THU	BESCK104D	BIDTK158		BPOPS103	BPHYS102				
FRI	BETCK105H	BMATS101		BESCK104D	BKBKK107		DEPT/COLLEGE ACTIVITIES/LIBRARY		
SAT	BESCK104D	BMATS101(T)		BPHYS102(T)	Proctor Meeting A1/A2/A3		LIBRARY		

SUBJECT CODE	SUBJECT NAME	NO. OF HOURS	FACULTY NAME
BMATS101	Mathematics for CSE Stream	4	Rekha.R
BPHYS102	Physics for CSE Stream	4	Nagasree.G
BPOPS103	Principles of Programming using C	2	Dr. Vaghdevi
BESCK104D	Introduction to Mechanical Engineering	3	Mathenullah Shariff
BETCK105H	Introduction to Internet of Things	3	Vindhya
BENGGK106	Communicative English	1	Swarupini
BKSKK107/BKBKK107	Samskruthika Kannada/ Balake Kannada	1	Deepa.G
BIDTK158	Innovation & Design Thinking	1	Vinay Kumar
MATL	Mat Lab	3x3	Anitha / Janavi
PHYL	Physics Lab	3x3	Dr. K. Sujatha / Nagasree. G
POPL	C-Programming Lab	3x3	Dr. Vaghdevi & Vindhya



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**TIMETABLE –FIRST SEMESTER – SEPTEMBER – 2023-24**  
**PHYSICS CYCLE**

SECTION: B

BRANCH: IS

ROOM NO: A006

DAY	9:00-10:00	10:00-11:00	11:00-11:15	11:15 -12:15	12:15-1:15	1:15-2:00	2:00-3:00	3:00-4:00	4:00-5:00	
MON	BETCK105H	BKSKK107	<b>BREAK</b>	BPOPS103	BESCK104D	<b>LUNCH</b>				
TUE	BMATS101	BETCK105H		BESCK104D	BPHYS102		←-PHYL/ POPL/MATL /B1/B2/B3-→			
WED	BPOPS103	←-PHYL/		POPL /MATL /B2/B3/B1→						
THU	BMATS101	BPHYS102		BESCK104D	BENGGK106		←- PHYL/POPL/MATL/B3/B1/B2-→			
FRI	BPHYS102	BETCK105H		BMATS101	BKBKK107		DEPT/COLLEGE ACTIVITIES/LIBRARY			
SAT	BMATS101(T)	BPHYS102(T)		BIDTK158	Proctor meeting B1/B2/B3		LIBRARY			

SUBJECT CODE	SUBJECT NAME	NO OF HOURS	FACULTY NAME
BMATS101	Mathematics for CSE Stream	4	Vanitha
BPHYS102	Physics for CSE Stream	4	Nagasree.G
BPOPS103	Principles of Programming using C	2	Spoorthi.M
BESCK104D	Introduction to Mechanical Engineering	3	Dr.Uma
BETCK105H	Introduction to Internet of Things	3	Vibhavi
BENGGK106	Communicative English	1	Swarupini
BKSKK107/BKBKK107	Samskruthika Kannada/ Balake Kannada	1	Deepa.G
BIDTK158	Innovation & Design Thinking	1	Vinay Kumar
MATL	Mat Lab	3x3	Anitha / Janavi
PHYL	Physics Lab	3x3	Dr. K Sujatha / Nagasree.G
POPL	C-Programming Lab	3x3	Spoorthi.M



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**TIMETABLE –FIRST SEMESTER – SEPTEMBER – 2023-24**  
**PHYSICS CYCLE**

**SECTION: C**

**BRANCH: EC**

**ROOM NO: A005**

DAY	9:00-10:00	10:00-11:00	11:00-11:15	11:15 -12:15	12:15-1:15	1:15-2:00	2:00-3:00	3:00-4:00	4:00-5:00
MON	BESCK104E	← PHYL/	<b>BREAK</b>	CPL /MATL/C1/C2/C3→		<b>LUNCH</b>	BBEE103	BENCK106	
TUE	BPHYE102	BESCK104E		BMATE101	BBEE103				
WED	BBEE103	BMATE101		BETCK105H	BPHYE102		DEPT/COLLEGE ACTIVITIES/LIBRARY		
THU	BETCK105H	← PHYL/		CPL /MATL/C2/C3/C1→					
FRI	BMATE101	BPHYE102		BKSKK107	BKBKK107		←-PHYL/ CPL/MATL/C3/C1/ C2-→		
SAT	BPHYE102(T)	BIDTK158		BETCK105H	BMATE101(T)		Proctor Meeting C1/C2/C3		

SUBJECT CODE	SUBJECT NAME	NO OF HOURS	FACULTY NAME
BMATE101	Mathematics for EEE Stream	4	Anitha
BPHYE102	Physics for EEE Stream	4	Dr. K. Sujatha
BBEE103	Basic Electronics	3	Dr. Ravindra.
BESCK104E	Introduction to C-Programming	2	Spoorthi. M
BETCK105H	Introduction to Internet of Things	3	Vibhavi
BENCK106	Communicative English	1	Swarupini
BKSKK107/ BKBKK107	Samskruthika Kannada/ Balake Kannada	1	Deepa. G
BIDTK158	Innovation & Design Thinking	1	Vinay Kumar
MATL	Mat Lab	3x3	Anitha / Janavi
PHYL	Physics Lab	3x3	Dr. K Sujatha / Nagasree. G
CPL	C-Programming Lab	3x3	Spoorthi .M /



**HOD**  
**Department of Physics**



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**CITY ENGINEERING COLLEGE**  
**TIMETABLE –FIRST SEMESTER – SEPTEMBER – 2023-24**  
**PHYSICS CYCLE**  
**Individual Time Table**

**Dr. Sujatha K**

DAY	9:00-10:00	10:00-11:00	11:00-11:15	11:15 -12:15	12:15-1:15	1:15-2:00	2:00-3:00	3:00-4:00	4:00-5:00	
MON		←-PHYL/C1	<b>BREAK</b>	-----PHYL/C1-----→		<b>LUNCH</b>				
TUE	C	←-PHYL/A2		-----PHYL/A2-----→						
WED		←-PHYL/B2		PHYL/B2----→	C					
THU		←-PHYL/C2		-----PHYL/ C2-----→						
FRI		C						←-----PHYL/ C3-----→		
SAT	C(T)									



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**CITY ENGINEERING COLLEGE**  
**TIME TABLE –FIRST SEMESTER SEPTEMBER – 2023-24**  
**PHYSICS CYCLE**  
**Individual Time Table**

Mrs. Nagashree G

DAY	9:00-10:00	10:00-11:00	11:00-11:15	11:15 -12:15	12:15-1:15	1:15-2:00	2:00-3:00	3:00-4:00	4:00-5:00
MON		A	<b>BREAK</b>			<b>LUNCH</b>	←-----PHYL / A1-----→		
TUE					B		←-----PHYL/ B1-----→		
WED	A						←-----PHYL/ A3-----→		
THU		B			A		←-----PHYL/ B3-----→		
FRI	B								
SAT		B(T)			A(T)				



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**CITY ENGINEERING COLLEGE**  
**TIMETABLE –FIRST SEMESTER – SEPTEMBER – 2023-24**  
**PHYSICS CYCLE**  
**Individual Time Table**

Mr. Dinesh S

DAY	9:00-10:00	10:00-11:00	11:00-11:15	11:15 -12:15	12:15-1:15	1:15-2:00	2:00-3:00	3:00-4:00	4:00-5:00
MON		← PHYL/C1	<b>BREAK</b>	-----PHYL/C1-----→		<b>LUNCH</b>	←----- PHYL / A1-----→		
TUE		← PHYL/A2		-----PHYL/A2-----→			←-----PHYL/ B1-----→		
WED		← PHYL/B2		-----PHYL/B2-----→			←-----PHYL/ A3-----→		
THU		← PHYL/C2		-----PHYL/ C2-----→			←----- PHYL/ B3-----→		
FRI							←-----PHYL/ C3-----→		
SAT									



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Course Title:	<b>Applied Physics for CSE Stream</b>		
Course Code:	<b>BPHYS102/202</b>	CIE Marks	50
Course Type (Theory/Practical/Integrated )	Integrated	SEE Marks	50
		Total Marks	100
Teaching Hours/Week (L:T:P: S)	2:2:2:0	Exam Hours	03
Total Hours of Pedagogy	40 hours Theory + 10-12 Lab slots	Credits	04
<b>Course objectives</b>			
<ul style="list-style-type: none"> <li>To study the essentials of photonics and its application in computer science.</li> <li>To study the principles of quantum mechanics and its application in quantum computing.</li> <li>To study the electrical properties of materials</li> <li>To study the essentials of physics for computational aspects like design and data analysis.</li> </ul>			
<b>Teaching-Learning Process</b>			
These are sample Strategies, which teacher can use to accelerate the attainment of the various course outcomes and make Teaching –Learning more effective			
<ol style="list-style-type: none"> <li>Flipped Class</li> <li>Chalk and Talk</li> <li>Blended Mode of Teaching and Learning</li> <li>Simulations, Interactive Simulations and Animations</li> <li>NPTEL and Other Videos for theory topics</li> <li>Smart Class Room</li> <li>Lab Experiment Videos</li> </ol>			
<b>Module-1 (8 Hours)</b>			
<b>Laser and Optical Fibers:</b>			
<b>LASER:</b> Characteristic properties of a LASER beam, Interaction of Radiation with Matter, Einstein's A and B Coefficients and Expression for Energy Density (Derivation), Laser Action, Population Inversion, Metastable State, Requisites of a laser system, Semiconductor Diode Laser, Applications: Bar code scanner, Laser Printer, Laser Cooling(Qualitative), Numerical Problems.			
<b>Optical Fiber:</b> Principle and Structure, Propagation of Light, Acceptance angle and Numerical Aperture (NA), Derivation of Expression for NA, Modes of Propagation, RI Profile, Classification of Optical Fibers, Attenuation and Fiber Losses, Applications: Fiber Optic networking, Fiber Optic Communication. Numerical Problems			
<b>Pre requisite:Properties of light</b>			
<b>Self-learning: Total Internal Reflection</b>			
<b>Module-2 (8 Hours)</b>			
<b>Quantum Mechanics:</b>			
de Broglie Hypothesis and Matter Waves, de Broglie wavelength and derivation of expression by analogy, Phase Velocity and Group Velocity, Heisenberg's Uncertainty Principle and its application (Non existence of electron inside the nucleus - Non Relativistic), Principle of Complementarity, Wave Function, Time independent Schrödinger wave equation (Derivation), Physical Significance of a wave function and Born Interpretation, Expectation value, Eigen functions and Eigen Values, Particle inside one dimensional infinite potential well, Quantization of Energy States, Waveforms and Probabilities. Numerical Problems.			
<b>Pre requisite:Wave–Particle dualism</b>			
<b>Self-learning: de Broglie Hypothesis</b>			
<b>Module-3 (8 Hours)</b>			
<b>Quantum Computing:</b>			
<b>Principles of Quantum Information &amp; Quantum Computing:</b>			
Introduction to Quantum Computing, Moore's law & its end, Differences between Classical & Quantum computing. Concept of qubit and its properties. Representation of qubit by Bloch sphere. Single and Two qubits. Extension to N qubits.			
<b>Dirac representation and matrix operations:</b>			
Matrix representation of 0 and 1 States, Identity Operator I, Applying I to $ 0\rangle$ and $ 1\rangle$ states, Pauli Matrices and its			

operations on  $|0\rangle$  and  $|1\rangle$  states, Explanation of i) Conjugate of a matrix and ii) Transpose of a matrix. Unitary matrix U, Examples: Row and Column Matrices and their multiplication (Inner Product), Probability, and Quantum Superposition, normalization rule. Orthogonality, Orthonormality. Numerical Problems

**Quantum Gates:**

**Single Qubit Gates:** Quantum Not Gate, Pauli – X, Y and Z Gates, Hadamard Gate, Phase Gate (or S Gate), T Gate

**Multiple Qubit Gates:** Controlled gate, CNOT Gate, (Discussion for 4 different input states). Representation of Swap gate, Controlled -Z gate, Toffoli gate.

**Pre requisites: Matrices**

**Self-learning: Moore's law**

**Module-4 (8 Hours)**

**Electrical Properties of Materials and Applications**

**Electrical Conductivity in metals**

Resistivity and Mobility, Concept of Phonon, Matheissen's rule, Failures of Classical Free Electron Theory, Assumptions of Quantum Free Electron Theory, Fermi Energy, Density of States, Fermi Factor, Variation of Fermi Factor With Temperature and Energy. Numerical Problems.

**Superconductivity**

Introduction to Super Conductors, Temperature dependence of resistivity, Meissner's Effect, Critical Field, Temperature dependence of Critical field, Types of Super Conductors, BCS theory (Qualitative), Quantum Tunnelling, High Temperature superconductivity, Josephson Junctions (Qualitative), DC and RF SQUIDS (Qualitative), Applications in Quantum Computing: Charge, Phase and Flux qubits, Numerical Problems.

**Pre requisites: Basics of Electrical conductivity**

**Self-learning: Resistivity and Mobility**

**Module-5 (8 hours)**

**Applications of Physics in computing:**

**Physics of Animation:**

Taxonomy of physics based animation methods, Frames, Frames per Second, Size and Scale, Weight and Strength, Motion and Timing in Animations, Constant Force and Acceleration, The Odd rule, Odd-rule Scenarios, Motion Graphs, Examples of Character Animation: Jumping, Parts of Jump, Jump Magnification, Stop Time, Walking: Strides and Steps, Walk Timing. Numerical Problems

**Statistical Physics for Computing:** Descriptive statistics and inferential statistics, Poisson distribution and modeling the probability of proton decay, Normal Distributions (Bell Curves), Monte Carlo Method: Determination of Value of  $\pi$ . Numerical Problems.

**Pre requisites: Motion in one dimension, Probability**

**Self-learning: Frames, Frames per Second**

**Course outcome (Course Skill Set)**

At the end of the course the student will be able to:

CO1	<b>Describe</b> the principles of LASERS and Optical fibers and their relevant applications.
CO2	<b>Discuss</b> the basic principles of the Quantum Mechanics and its application in Quantum Computing.
CO3	<b>Summarize</b> the essential properties of superconductors and its applications in qubits.
CO4	<b>Illustrate</b> the application of physics in design and data analysis.
CO5	<b>Practice</b> working in groups to conduct experiments in physics and <b>perform</b> precise and honest measurements.

**Assessment Details (both CIE and SEE)**

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks out of 50). The minimum passing mark for the SEE is 35% of the maximum marks (18 marks out of 50). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination(SEE), and a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

**Continuous Internal Evaluation(CIE):**

The CIE marks for the theory component of the IC shall be **30 marks** and for the laboratory component **20 Marks**.

**CIE for the theory component of the IC**

- Three Tests each of 20 Marks; after the completion of the syllabus of 35-40%, 65-70%, and 90-100% respectively.
- Two Assignments/two quizzes/ seminars/one field survey and report presentation/one-course project totalling 20 marks.

Total Marks scored (test + assignments) out of 80 shall be scaled down to **30 marks**

**CIE for the practical component of the IC**

- On completion of every experiment/program in the laboratory, the students shall be evaluated and marks shall be awarded on the same day. The **15 marks** are for conducting the experiment and preparation of the laboratory record, the other **05 marks shall be for the test** conducted at the end of the semester.
- The CIE marks awarded in the case of the Practical component shall be based on the continuous evaluation of the laboratory report. Each experiment report can be evaluated for 10 marks. Marks of all experiments' write-ups are added and scaled down to 15 marks.
- The laboratory test (**duration 03 hours**) at the end of the 15<sup>th</sup> week of the semester /after completion of all the experiments (whichever is early) shall be conducted for 50 marks and scaled down to **05 marks**.

Scaled-down marks of write-up evaluations and tests added will be CIE marks for the laboratory component of IC/IPCC for **20 marks**.

- The minimum marks to be secured in CIE to appear for SEE shall be 12 (40% of maximum marks) in the theory component and 08 (40% of maximum marks) in the practical component. The laboratory component of the IC/IPCC shall be for CIE only. However, in SEE, the questions from the laboratory component shall be included. The maximum of 05 questions is to be set from the practical component of IC/IPCC, the total marks of all questions should not be more than 25 marks.

The theory component of the IC shall be for both CIE and SEE.

**Semester End Examination(SEE):**

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the subject (**duration 03 hours**)

- The question paper shall be set for 100 marks. The medium of the question paper shall be English/Kannada). The duration of SEE is 03 hours.
- The question paper will have 10 questions. Two questions per module. Each question is set for 20 marks. The students have to answer 5 full questions, selecting one full question from each module. The student has to answer for 100 marks and **marks scored out of 100 shall be proportionally reduced to 50 marks**.

There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), **should have a mix of topics** under that module.

**Suggested Learning Resources:****Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)**

1. Solid State Physics, S O Pillai, New Age International Private Limited, 8<sup>th</sup> Edition, 2018.
2. Engineering Physics by Gupta and Gour, Dhanpat Rai Publications, 2016 (Reprint).
3. A Textbook of Engineering Physics- M.N. Avadhanulu and P.G. Kshirsagar, 10th revised Ed, S. Chand. & Company Ltd, New Delhi.
4. Concepts of Modern Physics, Aurthur Beiser, McGrawhill, 6<sup>th</sup> Edition, 2009.
5. Lasers and Non Linear Optics, B B Loud, New age international, 2011 edition.
6. A Textbook of Engineering Physics by M.N. Avadhanulu, P G. Kshirsagar and T V S Arun Murthy, Eleventh edition, S Chand and Company Ltd. New Delhi-110055.
7. Quantum Computation and Quantum Information, Michael A. Nielsen & Isaac L. Chuang, Cambridge Universities Press, 2010 Edition.

8. Quantum Computing, Vishal Sahani, McGraw Hill Education, 2007 Edition.
9. Quantum Computing – A Beginner’s Introduction, Parag K Lala, Indian Edition, Mc GrawHill, Reprint 2020.
10. Engineering Physics, S P Basavaraj, 2005 Edition, Subhash Stores.
11. Physics for Animators, Michele Bousquet with Alejandro Garcia, CRC Press, Taylor & Francis, 2016.
12. Quantum Computation and Logic: How Quantum Computers Have Inspired Logical Investigations, Maria Luisa Dalla Chiara, Roberto Giuntini, Roberto Leporini, Giuseppe Sergioli, Trends in Logic, Volume 48, Springer.
13. Statistical Physics: Berkely Physics Course, Volume 5, F. Reif, McGraw Hill.
14. Introduction to Superconductivity, Michael Tinkham, McGraw Hill, INC, II Edition

**Web links and Video Lectures (e-Resources):**

**LASER:** <https://www.youtube.com/watch?v=WgzynzPiyc>

**Superconductivity :** <https://www.youtube.com/watch?v=MT5Xl5ppn48>

**Optical Fiber :** [https://www.youtube.com/watch?v=N\\_kA8EpCUQo](https://www.youtube.com/watch?v=N_kA8EpCUQo)

**Quantum Mechanics :** <https://www.youtube.com/watch?v=p7bzE1E5PMY&t=136s>

**Quantum Computing :** <https://www.youtube.com/watch?v=jHoEjvuPoB8>

**Quantum Computing :** <https://www.youtube.com/watch?v=ZuvCUU2jD30>

**Physics of Animation :** [https://www.youtube.com/watch?v=kj1kaA\\_8Fu4](https://www.youtube.com/watch?v=kj1kaA_8Fu4)

**Statistical Physics Simulation :** [https://phet.colorado.edu/sims/html/plinko-probability/latest/plinko-probability\\_en.html](https://phet.colorado.edu/sims/html/plinko-probability/latest/plinko-probability_en.html)

**NPTEL Superconductivity:** <https://archive.nptel.ac.in/courses/115/103/115103108/>

**NPTEL Quantum Computing :** <https://archive.nptel.ac.in/courses/115/101/115101092>

**Virtual LAB :** <https://www.vlab.co.in/participating-institute-amrita-vishwa-vidyapeetham>

**Virtual LAB :** <https://vlab.amrita.edu/index.php?sub=1&brch=189&sim=343&cnt=1>

**Activity Based Learning (Suggested Activities in Class)/ Practical Based learning**

<http://nptel.ac.in>

<https://swayam.gov.in>

[https://virtuallabs.merlot.org/vl\\_physics.html](https://virtuallabs.merlot.org/vl_physics.html)

<https://phet.colorado.edu>

<https://www.myphysicslab.com>

**Laboratory Component:**

Any Ten Experiments have to be completed from the list of experiments

**Note:** The experiments have to be classified into

- a) Exercise
- b) Demonstration
- c) Structured Inquiry
- d) Open Ended

Based on the convenience classify the following experiments into above categories. Select at least one simulation/spreadsheet activity.

***List of Experiments***

1. Determination of wavelength of LASER using Diffraction Grating.
2. Determination of acceptance angle and numerical aperture of the given Optical Fiber.
3. Determination of Magnetic Flux Density at any point along the axis of a circular coil.
4. Determination of resistivity of a semiconductor by Four Probe Method
5. Study the I-V Characteristics of the Given Bipolar Junction Transistor.
6. Determination of dielectric constant of the material of capacitor by Charging and Discharging method.
7. Study the Characteristics of a Photo-Diode and to determine the power responsivity / Verification of Inverse Square Law of Intensity of Light.
8. Study the frequency response of Series & Parallel LCR circuits.
9. Determination of Planck's Constant using LEDs.
10. Determination of Fermi Energy of Copper.
11. Identification of circuit elements in a Black Box and determination of values of the components.
12. Determination of Energy gap of the given Semiconductor.
13. Step Interactive Physical Simulations.
14. Study of motion using spread Sheets
15. Study of Application of Statistics using spread sheets
16. PHET Interactive

Simulations(<https://phet.colorado.edu/en/simulations/filter?subjects=physics&type=html.prototype>)

**COs and POs Mapping (Individual teacher has to fill up)**

COs	POs											
	1	2	3	4	5	6	7	8	9	10	11	12
CO1	3	2	-	-	-	-	-	-	-	-	-	2
CO2	3	3	-	-	-	-	-	-	-	-	-	2
CO3	3	3	-	-	-	-	-	-	-	-	-	2
CO4	3	2	1	-	1	-	-	-	-	-	-	2
CO5	3	2	1	-	2	-	-	3	3	-	-	2

**Level 3- Highly Mapped, Level 2-Moderately Mapped, Level 1-Low Mapped,**

**Note :** The CO-PO mapping values are indicative. The course coordinator can alter the mapping using **Competency and Performance Indicators** mentioned in the **AICTE Exam reforms**.



## DEPARTMENT OF PHYSICS

### LESSON PLAN FOR EVEN SEMESTER FOR ACADEMIC YEAR 2023 - 2024

Course Title: Applied Physics for CSE stream	Course Code : BPHYS102
Total contact hours: L:T:P:S :: 2:2:2:0	Course Type : Integrated
CIE Marks : 50 SEE Marks :50	Total Marks : 100
Semester: I	Academic year : 2023-2024
Lesson plan Author: Dr. K Sujatha, Nagasree G, Dinesh S	Date :06/09/2023

#### Course Objective:

- To study the essentials of photonics and its application in computer science.
- To study the principles of quantum mechanics and its application in quantum computing.
- To study the electrical properties of materials
- To study the essentials of physics for computational aspects like design and data analysis.

#### Course Outcomes:

After studying this course, students will be able to:

CO1- Describe the principles of LASERS and Optical fibers and their relevant applications.

CO2 -Discuss the basic principles of the Quantum Mechanics and its application in Quantum Computing.

CO3- Summarize the essential properties of superconductors and its applications in qubits.

CO4- Illustrate the application of physics in design and data analysis.

CO5- Practice working in groups to conduct experiments in physics and perform precise and honest measurements.

### MODULE-1

Week	Days/ Date	Contents of Module Lasers and Optical Fibers	Bloom's Taxonomy Level	Course Outcome (CO)
1	1	Characteristic properties of a LASER beam, Interaction of Radiation with Matter, Einstein's A and B	R,U	CO1
	2	Coefficients and Expression for Energy Density (Derivation), Laser Action,	R,U	CO1
	3	Population Inversion, Metastable State, Requisites of a laser system,	R,U	CO1
	4	Semiconductor Diode Laser, Applications: Bar code scanner, Laser Printer, Laser Cooling(Qualitative), Numerical Problems	R,U,E,C	CO1
2	1	Principle and Structure, Propagation of Light,	R,U	CO1
	2	Acceptance angle and Numerical Aperture (NA),	R,U	CO1
	3	Derivation of Expression for NA, Modes of Propagation, RI Profile, Classification of Optical Fibers,	R,U	CO1
	4	Attenuation and Fiber Losses, Applications: Fiber Optic networking, Fiber Optic Communication. Numerical Problems	R,U	CO1

### MODULE-2

Week	Days/ Date	Contents of Module Quantum Mechanics	Bloom's Taxonomy Level	Course Outcome (CO)
3	1	de Broglie Hypothesis and Matter Waves, de Broglie wavelength	R,U	CO2
	2	derivation of expression by analogy, Phase Velocity and Group Velocity	R,U	CO2
	3	Heisenberg's Uncertainty Principle and its application (Non existence of electron inside the nucleus - Non Relativistic),	R,U	CO2
	4	Principle of Complementarity, Wave Function, Time independent Schrödinger wave equation (Derivation)	R,U	CO2
4	1	Physical Significance of a wave function and Born Interpretation	R,U	CO2
	2	Expectation value, Eigen functions and Eigen Values,	R,U	CO2
	3	Particle inside one dimensional infinite potential well,	R,U	CO2
	4	Quantization of Energy States, Waveforms and Probabilities. Numerical Problems	R,U	CO2

### MODULE-3

Week	Days/ Date	Contents of Module Quantum Computing	Bloom's Taxonomy Level	Course Outcome (CO)
5	1	Introduction to Quantum Computing, Moore's law & its end	R,U	CO2
	2	Differences between Classical & Quantum computing. Concept of qubit and its properties.	R,U	CO2
	3	Representation of qubit by Bloch sphere. Single and Two qubits. Extension to N qubits.	R,U,E	CO2
	4	Matrix representation of 0 and 1 States, Identity Operator I, Applying I to $ 0\rangle$ and $ 1\rangle$ states, Pauli Matrices and its operations on $ 0\rangle$ and $ 1\rangle$ states,	R,U	CO2
6	1	Explanation of i) Conjugate of a matrix and ii) Transpose of a matrix. Unitary matrix U, Examples: Row and Column Matrices and their multiplication (Inner Product),	R,U	CO2
	2	Probability, and Quantum Superposition, normalization rule. Orthogonality, Orthonormality. Numerical Problems	R,U	CO2
	3	Single Qubit Gates: Quantum Not Gate, Pauli – X, Y and Z Gates, Hadamard Gate, Phase Gate (or S Gate), T Gate	R,U	CO2
	4	Multiple Qubit Gates: Controlled gate, CNOT Gate, (Discussion for 4 different input states). Representation of Swap gate, Controlled -Z gate, Toffoli gate.	R,U	CO2

### MODULE-4

Week	Days/ Date	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
7	1	Resistivity and Mobility, Concept of Phonon, Matheissen's rule,	R,U,	CO3
	2	Failures of Classical Free Electron Theory	R,U	CO3
	3	Assumptions of Quantum Free Electron Theory, Fermi Energy, Density of States,	R,U	CO3
	4	Fermi Factor, Variation of Fermi Factor With Temperature and Energy. Numerical Problems	R,U	CO3
8	1	Introduction to Super Conductors, Temperature dependence of resistivity	R,U	CO3
	2	Meissner's Effect, Critical Field, Temperature dependence of Critical field, Types of Super Conductors, BCS theory (Qualitative)	R,U	CO3
	3	Quantum Tunnelling, High Temperature superconductivity, Josephson Junctions (Qualitative), DC and RF SQUIDS (Qualitative),	R,U	CO3
	4	Applications in Quantum Computing: Charge, Phase and Flux qubits, Numerical Problems.	R,U	CO3

### MODULE-5

Week	Days/ Date	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
9	1	Taxonomy of physics based animation methods, Frames, Frames per Second, Size and Scale	R,U,A2	CO4
	2	Weight and Strength, Motion and Timing in Animations, Constant Force and Acceleration,	R,U	CO4
	3	The Odd rule, Odd-rule Scenarios, Motion Graphs, Examples of Character Animation:	R,U	CO4
	4	Jumping, Parts of Jump, Jump Magnification, Stop Time, Walking: Strides and Steps, Walk Timing	R,U	CO4
10	1	Numerical Problems	R,U,E	CO4
	2	Descriptive statistics and inferential statistics, Poisson distribution and modeling the probability of proton decay,	R,U	CO4
	3	Normal Distributions (Bell Curves), Monte Carlo Method: Determination of Value of $\pi$ .	R,U	CO4
	4	Numerical Problems	R,U	CO4



**Bloom's Taxonomy Level :R-Remembering U-Understanding A1-Applying  
A2-Analysing  
E-evaluating C-Creating**

**Suggested Learning Resources:**

**Books (Title of the Book/Name of the author/Name of the publisher/Edition and Year)**

1. Solid State Physics, S O Pillai, New Age International Private Limited, 8th Edition, 2018.
2. Engineering Physics by Gupta and Gour, Dhanpat Rai Publications, 2016 (Reprint).
3. A Textbook of Engineering Physics- M.N. Avadhanulu and P.G. Kshirsagar, 10th revised Ed, S. Chand. & Company Ltd, New Delhi.
4. A Textbook of Engineering Physics by M.N. Avadhanulu, P G. Kshirsagar and T V S Arun Murthy, Eleventh edition, S Chand and Company Ltd. New Delhi-110055.
5. Quantum Computation and Quantum Information, Michael A. Nielsen & Isaac L. Chuang, Cambridge Universities Press, 2010 Edition. 26.10.2022 4
6. Quantum Computing, Vishal Sahani, McGraw Hill Education, 2007 Edition.
- 7 Quantum Computing – A Beginner's Introduction, Parag K Lala, Indian Edition, Mc GrawHill, Reprint 2020.
8. Engineering Physics, S P Basavaraj, 2005 Edition, Subhash Stores.
9. Physics for Animators, Michele Bousquet with Alejandro Garcia, CRC Press, Taylor & Francis, 2016.
10. Quantum Computation and Logic: How Quantum Computers Have Inspired Logical Investigations, Maria Luisa Dalla Chiara, Roberto Giuntini, Roberto Leporini, Giuseppe Sergioli, Trends in Logic, Volume 48, Springer.

**Web links and Video Lectures (e-Resources):**

- LASER: <https://www.youtube.com/watch?v=WgzynzPiyC>  
Superconductivity : <https://www.youtube.com/watch?v=MT5Xl5ppn48>  
Optical Fiber : [https://www.youtube.com/watch?v=N\\_kA8EpCUQo](https://www.youtube.com/watch?v=N_kA8EpCUQo)  
Quantum Mechanics : <https://www.youtube.com/watch?v=p7bzE1E5PMY&t=136s>  
Quantum Computing : <https://www.youtube.com/watch?v=jHoEjvuPoB8>  
Physics of Animation : [https://www.youtube.com/watch?v=kj1kaA\\_8Fu4](https://www.youtube.com/watch?v=kj1kaA_8Fu4)  
Statistical Physics Simulation : [https://phet.colorado.edu/sims/html/plinko-probability/latest/plinkoprobability\\_en.html](https://phet.colorado.edu/sims/html/plinko-probability/latest/plinkoprobability_en.html)  
NPTEL Quantum Computing : <https://archive.nptel.ac.in/courses/115/101/115101092>  
Virtual LAB : <https://www.vlab.co.in/participating-institute-amrita-vishwa-vidyapeetham>  
Virtual LAB : <https://vlab.amrita.edu/index.php?sub=1&brch=189&sim=343&cnt=1>

**Activity Based Learning (Suggested Activities in Class)/ Practical Based learning**

- <http://nptel.ac.in>  
<https://swayam.gov.in>  
[https://virtuallabs.merlot.org/vl\\_physics.html](https://virtuallabs.merlot.org/vl_physics.html)  
<https://phet.colorado.edu>  
<https://www.myphysicslab.com>



**Staff**

**Department of Physics**



**HOD**

**Department of Physics**



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## Question Bank

Course Name: Applied Physics for CSE Stream

Course Code: BPHYS102

Semester: I

Section: A, B & C

### Module-I

#### Laser and Optical Fibers:

1. Explain the three possible ways through which radiation interacts with matter.
2. Derive the expression for energy density by using Einstein's coefficients.
3. Explain the requisites and conditions to obtain a laser beam.
4. Explain the construction and working of semiconductor laser with energy level diagram.
5. Explain the applications of lasers in
  - a) Bar code
  - b) Laser printer
  - c) Laser cooling
6. What is Numerical Aperture? Derive the expression for Numerical Aperture with a neat diagram.
7. With neat diagrams explain the different types of optical fibers.
8. What is attenuation. Explain the different types of attenuation mechanisms with neat diagrams.
9. Write a note on applications of optical fibers in
  - a) Fiber optic networking
  - b) Point to point communication
10. Mention the advantages and disadvantages of optical fibers in point-to-point communication.



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## Module-II

### Quantum Mechanics:

1. Explain De-Broglie hypothesis and derive the expression for de Broglie wavelength and what are the characteristics of matter waves.
2. Define phase velocity and group velocity and mention the expression for the same.
3. State and explain Heisenberg's uncertainty principle and its physical significance.
4. Using uncertainty principle prove that free electron cannot exist inside the nucleus.
5. What is a wave function and what are the properties of wave function.
6. Explain a) Max-Born interpretation b) Normalization.
7. Derive the expression for time independent Schrodinger wave equation in one dimension.
8. Using the time independent Schrodinger wave equation obtain the solution for normalized wave function.
9. Find eigenvalues and eigen functions for a particle in one dimensional potential well.
10. Discuss the wave function probability densities and eigen energy values for a free particle in a box by considering the ground state and first two excited states.



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## Module-III

### Quantum Computing

1. State and explain Moore's law.
2. Compare classical and quantum information.
3. Mention the differences between classical and quantum computing.
4. What is qubit? Mention the properties of qubits.
5. What is Bloch sphere? Represent the single qubit states  $|0\rangle$  and  $|1\rangle$  on the Bloch sphere.
6. Discuss matrix form of single qubit, two qubit states and n-qubits.
7. Compose identity operator? Show that identity operator operates on the states  $|0\rangle$  and  $|1\rangle$  leaves the same states.
8. Mention the Pauli matrices. Discuss the Pauli matrices operation on  $|0\rangle$  and  $|1\rangle$  states.
9. Explain conjugate and transpose of matrix.
10. What are unitary, row and column matrix? What is the condition for matrix multiplication or inner product? Give one example.
11. What is unitary operator? Show that  $U^\dagger U = U U^\dagger = I$  using the matrix  $A = \begin{bmatrix} \cos\theta & i\sin\theta \\ i\sin\theta & \cos\theta \end{bmatrix}$ .
12. Explain probability, normalisation, quantum superposition, orthogonality and orthonormality.
13. Explain single qubit quantum NOT gate.
14. Mention unitary operator for Pauli X, Y, Z, and Hadamard quantum gates using tensor product or outer product. Explain the operations of Pauli X, Y, Z, and Hadamard quantum gates on  $|0\rangle$  and  $|1\rangle$  states. And represent the input and output states on the Bloch sphere.
15. Obtain unitary operator for S (Swap) gate using rotation unitary operator  $RZ(\varphi) = e^{-i\varphi/2} \cdot \sigma_Z$ . Show that  $T = \sqrt{S}$ .
16. What are two qubit quantum logic gates? Discuss two qubit quantum NOT gate or controlled NOT gate with four different input states.
17. Discuss two qubit quantum S gate or controlled S gate with four different input states.
18. Discuss two qubit quantum Z gate or controlled Z gate with four different input states.
19. What are three qubit quantum logic gates?
20. Discuss Toffoli or controlled controlled NOT or C2NOT gate with all different 8 (eight) input states.



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## Module-IV

### Electrical Properties of Materials and Applications:

1. Explain in brief classical free electron theory of metals.
2. Explain the effect of temperature and impurity on electrical resistivity of metals. (Matheissen's rule)
3. Explain the failures of classical free electron theory. What are the assumptions of quantum free electron theory.
4. Explain fermi factor and variation of fermi factor with temperature with suitable graph.
5. Explain the temperature dependence of resistivity of metals and superconductors.
6. Explain BCS theory of superconductivity and formation of cooper pairs.
7. Explain Meissner's effect with suitable diagram.
8. Explain critical field and temperature dependence of critical field.
9. Explain the different types of superconductors by giving examples of each with suitable graphs.
10. Write a note on high temperature superconductors.
11. Explain quantum tunneling, Josephson junction and its types.
12. What is a SQUID. Explain DC and RF SQUIDS using diagrams.
13. Explain flux quantization with suitable diagram.
14. What are Qubits and explain flux, charge and phase Qubits.



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## Module-V

### Physics of Animation

1. What is animation. Explain frame and frame per second.
2. Explain a) size and scale b) proportion & scale c) weight and strength.
3. Explain motion and timing in animations  
(Linear motion, uniform motion, slow in & slow out)
4. Elucidate constant force and acceleration.
5. Explain the odd rule, odd rule multiplier and odd rule scenarios with examples.
6. Give a brief discussion about motion graphs.
7. Explain jumping and ports of jump in detail.
8. Explain jump magnification and acceleration.
9. Explain the calculation of push time stop time with examples.
10. Elucidate walking and explain strides and steps with neat diagram.
11. Distinguish between descriptive and inferential statistics.
12. Discuss the salient features of normal distribution using bell curves.
13. Mention the general pattern of monte Carlo method and hence determine the value of  $\pi$ .
14. Discuss modelling the probability for proton decay.
15. Explain Poisson distribution & mass function.

**Staff**

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## Assignment Questions

Course Name: Applied Physics for CSE Stream

Course Code: BPHYS102

Semester: I

Section: A, B & C

### Module-I

#### Laser and Optical Fibers:

1. Derive the expression for energy density by using Einstein's coefficients.
2. Explain the requisites and conditions to obtain a laser beam.
3. Explain the construction and working of semiconductor laser with energy level diagram.
4. Explain the applications of lasers in
  - a) Bar code
  - b) Laser printer
  - c) Laser cooling
5. What is Numerical Aperture? Derive the expression for Numerical Aperture with a neat diagram.
6. With neat diagrams explain the different types of optical fibers.
7. What is attenuation. Explain the different types of attenuation mechanisms with neat diagrams.
8. Write a note on applications of optical fibers in
  - a) Fiber optic networking
  - b) Point to point communication



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## Module-II

### Quantum Mechanics:

1. Explain De-Broglie hypothesis and derive the expression for de Broglie wavelength and what are the characteristics of matter waves.
2. State and explain Heisenberg's uncertainty principle and its physical significance.
3. Using uncertainty principle prove that free electron cannot exist inside the nucleus.
4. Explain a) Max-Born interpretation b) Normalization.
5. Derive the expression for time independent Schrodinger wave equation in one dimension.
6. Using the time independent Schrodinger wave equation obtain the solution for normalized wave function.
7. Find eigenvalues and eigen functions for a particle in one dimensional potential well.
8. Discuss the wave function probability densities and eigen energy values for a free particle in a box by considering the ground state and first two excited states.





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## Module-III

### Quantum Computing

1. State and explain Moore's law.
2. Compare classical and quantum information.
3. Mention the differences between classical and quantum computing.
4. What is qubit? Mention the properties of qubits.
5. What is Bloch sphere? Represent the single qubit states  $|0\rangle$  and  $|1\rangle$  on the Bloch sphere.
6. Discuss matrix form of single qubit, two qubit states and n-qubits.
7. Compose identity operator? Show that identity operator operates on the states  $|0\rangle$  and  $|1\rangle$  leaves the same states.
8. Mention the Pauli matrices. Discuss the Pauli matrices operation on  $|0\rangle$  and  $|1\rangle$  states.
9. Explain conjugate and transpose of matrix.
10. What are unitary, row and column matrix? What is the condition for matrix multiplication or inner product? Give one example.
11. What is unitary operator? Show that  $U^\dagger U = U U^\dagger = I$  using the matrix  $A = \begin{bmatrix} \cos\theta & i\sin\theta \\ i\sin\theta & \cos\theta \end{bmatrix}$ .
12. Explain probability, normalisation, quantum superposition, orthogonality and orthonormality.
13. Explain single qubit quantum NOT gate.
14. Mention unitary operator for Pauli X, Y, Z, and Hadamard quantum gates using tensor product or outer product. Explain the operations of Pauli X, Y, Z, and Hadamard quantum gates on  $|0\rangle$  and  $|1\rangle$  states. And represent the input and output states on the Bloch sphere.
15. Obtain unitary operator for S (Swap) gate using rotation unitary operator  $RZ(\varphi) = e^{-i\varphi/2} \cdot \sigma_Z$ . Show that  $T = \sqrt{S}$ .
16. What are two qubit quantum logic gates? Discuss two qubit quantum NOT gate or controlled NOT gate with four different input states.
17. Discuss two qubit quantum S gate or controlled S gate with four different input states.
18. Discuss two qubit quantum Z gate or controlled Z gate with four different input states.



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## Module-IV

### Electrical Properties of Materials and Applications:

1. Explain the failures of classical free electron theory. What are the assumptions of quantum free electron theory.
2. Explain fermi factor and variation of fermi factor with temperature with suitable graph.
3. Explain the temperature dependence of resistivity of metals and superconductors.
4. Explain BCS theory of superconductivity and formation of cooper pairs.
5. Explain Meissner's effect with suitable diagram.
6. Explain critical field and temperature dependence of critical field.
7. Explain the different types of superconductors by giving examples of each with suitable graphs.
8. Write a note on high temperature superconductors.
9. Explain quantum tunneling, Josephson junction and its types.
10. What is a SQUID. Explain DC and RF SQUIDS using diagrams.
11. Explain flux quantization with suitable diagram.
12. What are Qubits and explain flux, charge and phase Qubits.



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## Module-V

### Physics of Animation

1. What is animation. Explain frame and frame per second.
2. Explain a) size and scale b) proportion & scale c) weight and strength.
3. Explain motion and timing in animations  
(Linear motion, uniform motion, slow in & slow out)
4. Elucidate constant force and acceleration.
5. Explain the odd rule, odd rule multiplier and odd rule scenarios with examples.
6. Give a brief discussion about motion graphs.
7. Explain jumping and ports of jump in detail.
8. Explain jump magnification and acceleration.
9. Explain the calculation of push time stop time with examples.
10. Elucidate walking and explain strides and steps with neat diagram.
11. Distinguish between descriptive and inferential statistics.
12. Discuss the salient features of normal distribution using bell curves.
13. Mention the general pattern of monte Carlo method and hence determine the value of  $\pi$ .

**Staff**

**Mrs. Nagasree G**  
Department of Physics

**HOD**

**Dr. Sujatha**  
Department of Physics



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**CITY ENGINEERING COLLEGE**  
**First Internal Test**

**Course: Physics for CSE Stream**  
**Subject Code: BPHYS102**  
**Programme: AIML/IS Branch, Sem: 1<sup>ST</sup>, Sec: A/B**

**Date: 16/11/2023**  
**Time: 10.30AM-11.30AM**  
**Max. Marks: 25**

Q.No	ANSWER ALL QUESTIONS	Marks	CO'S
<b>PART-A</b>			
1	Explain the construction and working of semiconductor	5	CO1
<b>OR</b>			
2	The ratio of population inversion of two energy levels is $1.059 \times 10^{-30}$ Find the wavelength of Light emitted by spontaneous emissions at 330K.	5	CO1
<b>PART-B</b>			
3	With neat diagram explain the different types of optical fiber	5	CO1
<b>OR</b>			
4	Explain different types of attenuation with neat diagram	5	CO1
<b>PART-C</b>			
5	Explain Heisenberg's uncertainty principle and prove that the free electron does not exist inside the nucleus.	5	CO2
<b>OR</b>			
6	Find the de Broglie wavelength of an electron accelerated under a potential difference of 100 V	5	CO2
<b>PART-D</b>			
7	Derive the expression for time independent one dimension schrodinger's wave equation	5	CO2
<b>OR</b>			
8	An optical fiber has a core material of R.I 1.55 and its cladding has a R.I of 1.50. Calculate its numerical aperture and acceptance angle	5	CO1
<b>PART-E</b>			
9	Derive the expression for numerical aperture with neat diagram	5	CO1
<b>OR</b>			
10	Derive the expression for energy density by using Einstein's coefficients.	5	CO1



## **Course Outcomes: -**

**CO1--Describe the principles of Laser and optical fibers and their relevant application.**

**CO2--Discuss the basic principles of the Quantum mechanics and its applications.**

**CO3--Summarize the essential properties of superconductors and its applications in qubits.**

**CO4--Illustrate the application of physics in design and data analysis.**

**CO5--Practice working in groups to conduct experiments in physics and perform precise and honest measurements.**

## **Bloom's Taxonomy Level:**

**BT1—Remembering BT2---Understanding BT3---Applying BT4---Analyzing BT5----  
Evaluating BT6 ---Creating**

CITY ENGINEERING COLLEGE  
DEPARTMENT OF Physics

SCHEME FOR VALUATION

Internal Test I

Semester & Section: Ist / A, B

Date: 16/11/2023

Question No.	Details of the answer	Marks Distribution	Total Marks
	<u>Part - A</u>		
①	<p>Constroction &amp; diagram</p> <p>working with diagram</p> <p>arrive equation <math>E_g = \frac{hc}{\lambda}</math></p> <p style="margin-left: 150px;"><math>= 8400 \text{ eV}</math></p> <p>Applications</p> <p style="text-align: center;">(8)</p>	<p>1M</p> <p>2M</p> <p>1M</p> <p>1M</p>	5M
②	<p><u>Data</u> - <math>\frac{N_2}{N_1} = 1.059 \times 10^{-30}</math></p> <p style="margin-left: 100px;"><math>T = 330 \text{ K}</math></p> <p><u>Find</u> - <math>\lambda = ?</math></p> <p>W-K-T <math>\frac{N_2}{N_1} = e^{-\frac{hc}{\lambda kT}}</math></p> <p style="margin-left: 100px;"><math>\lambda = 632 \text{ nm}</math></p>	<p>1M</p> <p>1M</p> <p>2M</p> <p>1M</p>	5M
	<u>Part - B</u>		
③	<p>3 Types of optical fibers</p> <p>Explanation and diagram</p>	<p>2M</p> <p>3M</p>	5M

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DEPARTMENT OF Physics  
SCHEME FOR VALUATION  
Internal Test I

Semester & Section: Ist / A, B

Date: 16/11/2023

Question No.	Details of the answer	Marks Distribution	Total Marks
④	(8) Explanation of attenuation three different types of attenuator Suitable diagrams	1M 2M 2M	5M
⑤	<u>Part - c</u> Heisenberg's uncertainty principle statement with equations $w \cdot k \sim 1$ $\Delta x = 10^{-14} \text{ m}$ cosec upto $E \geq 85 \text{ MeV}$	2M 1M 2M	5M
⑥	(8) <u>Data</u> - potential, $V = 100 \text{ V}$ <u>find</u> - de Broglie wavelength $\lambda = ?$ $w \cdot k \sim 1$ $\lambda = \frac{h}{\sqrt{2meV}}$ $= 1.226 \text{ \AA}$	1M 2M 2M	5M

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 SCHEME FOR VALUATION  
 Internal Test I

Semester & Section: Ist / A, B

Date: 16/11/2023

Question No.	Details of the answer	Marks Distribution	Total Marks
7	<p style="text-align: center;"><u>Part-D</u></p> <p>w.k.t <math>\lambda = \frac{h}{p}</math> <math>\psi = Ae^{i(Kx - \omega t)}</math></p> <p>wave upto <math>\frac{1}{\lambda^2} = -\frac{1}{4\pi^2\psi} \frac{d^2\psi}{dx^2}</math></p> <p>and <math>E = K.E + P.E</math></p> <p>wave the equation:</p> $\frac{d^2\psi}{dx^2} + \frac{8\pi^2m}{h^2} (E - V)\psi = 0$ <p style="text-align: center;">(a)</p>	<p>1M</p> <p>2M</p> <p>2M</p>	<p>5M</p>
8	<p><u>Given</u> - <math>n_1 = 1.55</math>  <math>n_2 = 1.50</math></p> <p><u>Find</u> - <math>N.A = ?</math> <math>\wedge \theta_0 = ?</math></p> <p>w.k.t <math>N.A = \sqrt{n_1^2 - n_2^2}</math>  <math>\wedge \theta_0 = \sin^{-1}(N.A)</math>  <math>N.A = 0.3905</math>  <math>\theta_0 = 22.98^\circ</math></p>	<p>1M</p> <p>2M</p> <p>2M</p>	<p>5M</p>

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CITY ENGINEERING COLLEGE  
DEPARTMENT OF Physics  
SCHEME FOR VALUATION  
Internal Test I

Semester & Section: 1st (A, B)

Date: 16/11/2023

Question No.	Details of the answer	Marks Distribution	Total Marks
<p>(9)</p>	<p style="text-align: center;"><u>Post-E</u></p> <p>Diagram with explanation W.K.T by applying snelle law <math>n_1 \sin \theta_0 = n_2 \sin \theta_1</math> <math>\wedge n_1 \sin(90 - \theta_1) = n_2 \sin \theta_0</math> arrive up to <math>N.A = \sqrt{n_1^2 - n_2^2}</math> <math>\sin \theta_0 = N.A</math> <math>\wedge \sin \theta_c &lt; N.A</math> (3M)</p>	<p>2M</p> <p>2M</p> <p>1M</p>	<p>5M</p>
<p>(10)</p>	<p>Arrive Einstein's coefficients by case (i), case (ii) &amp; case (iii) W.K.T <math>B_{12} N_1 \nu_{21} = A_{21} N_2 + B_{12} N_2 \nu_{21}</math> arrive up to the equation <math>\nu_{21} = \frac{A}{B \left( e^{\frac{h\nu_{21}}{kT}} - 1 \right)}</math></p>	<p>2M</p> <p>1M</p> <p>2M</p>	<p>5M</p>

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**CITY ENGINEERING COLLEGE**  
**II<sup>nd</sup> Internal Test**

**Course: Physics for CSE Stream**  
**Subject Code: BPHYS102**  
**Programme: AIML/IS Branch, Sem: I<sup>ST</sup> & Sec: A/B**

**Date: 04/01/2024**  
**Time: 10.30AM-11.30AM**  
**Max. Marks: 25**

Q.No	ANSWER ALL QUESTIONS	Marks	CO'S
<b>PART-A</b>			
1	State and explain Moore's law and its end.	5	CO1
<b>OR</b>			
2	Show that matrix, $A \begin{bmatrix} 3 & 3+i \\ 3-i & 2 \end{bmatrix}$ is Hermitian.	5	CO1
<b>PART-B</b>			
3	Explain fermi factor and variation of fermi factor with temperature with a suitable diagram	5	CO1
<b>OR</b>			
4	Calculate the probability of an electron occupying an energy level 0.02 eV above the fermi level at 200K and 400K in a material	5	CO1
<b>PART-C</b>			
5	Mention the Pauli matrices, discuss the Pauli matrices operation on $ 0\rangle$ and $ 1\rangle$ state. Given $I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ , $X = \begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$ , $Y = \begin{bmatrix} 0 & -i \\ i & 0 \end{bmatrix}$ , $Z = \begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}$	5	CO2
<b>OR</b>			
6	Discuss two qubit quantum NOT gate or controlled NOT gate with four different input states.	5	CO2
<b>PART-D</b>			
7	Explain BCS theory of superconductivity with the formation of cooper pair.	5	CO2
<b>OR</b>			
8	What is a SQUID. Explain DC and Rf SQUID using diagrams.	5	CO1
<b>PART-E</b>			
9	Explain different types of super conductors with graph and examples	5	CO1
<b>OR</b>			
10	What is Bloch sphere? Represent the single qubit $ 0\rangle$ and $ 1\rangle$ on the Bloch sphere	5	CO1



## **Course Outcomes: -**

**CO1--Describe the principles of Laser and optical fibers and their relevant application.**

**CO2--Discuss the basic principles of the Quantum mechanics and its applications.**

**CO3--Summarize the essential properties of superconductors and its applications in qubits.**

**CO4--Illustrate the application of physics in design and data analysis.**

**CO5--Practice working in groups to conduct experiments in physics and perform precise and honest measurements.**

## **Bloom's Taxonomy Level:**

**BT1—Remembering BT2---Understanding BT3---Applying BT4---Analyzing BT5----Evaluating BT6 ---Creating**

CITY ENGINEERING COLLEGE  
DEPARTMENT OF Physics

SCHEME FOR VALUATION

Semester & Section: Ist / A, B Internal Test II

Date: 04/01/2024

Question No.	Details of the Answer	Marks Distribution	Total Marks
	<u>Part-A</u>		
①	Moore's law statement tabular column, graph Explanation (2M)	2M 2M 1M	5M
②	Given $A = \begin{bmatrix} 3 & 3+i \\ 3-i & 2 \end{bmatrix}$ Prove that $A^\dagger = A$ $A^\dagger = (A^*)^T$ $= \begin{bmatrix} 3 & 3-i \\ 3+i & 2 \end{bmatrix}^T$ $= \begin{bmatrix} 3 & 3+i \\ 3-i & 2 \end{bmatrix} = A$	1M 1M 2M 1M	5M
	<u>Part-B</u>		
③	Fermi factor explanation with graph and expression Explanation of all three cases	1M 1M 3M	5M

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DEPARTMENT OF Physics

SCHEME FOR VALUATION

Internal Test II

Semester & Section: Ist / A, B

Date: 04/01/2024

Question No.	Details of the answer	Marks Distribution	Total Marks
④	<p style="text-align: center;">(a)</p> <p>Given <math>E - E_F = 0.02 \text{ eV}</math></p> <p>Find <math>f(E)</math> at <math>200 \text{ K} = ?</math></p> <p><math>f(E)</math> at <math>400 \text{ K} = ?</math></p> <p>W.K.T <math>f(E) = \left( \frac{1}{e^{\frac{E - E_F}{kT}} + 1} \right)</math></p> <p><math>f(E) = 0.24</math> at <math>200 \text{ K}</math></p> <p><math>f(E) = 0.36</math> at <math>400 \text{ K}</math></p>	<p>1M</p> <p>2M</p> <p>1M</p> <p>1M</p>	5M
⑤	<p style="text-align: center;">Part c</p> <p>Pauli Matrices explanation</p> <p><math>\sigma_x, \sigma_y, \sigma_z</math></p> <p>operate of Pauli matrices on <math> 0\rangle</math> &amp; <math> 1\rangle</math>.</p>	<p>2M</p> <p>1M</p> <p>2M</p>	5M
⑥	<p style="text-align: center;">(b)</p> <p>Explanation of two qubit NOT Gate</p> <p>Matrix representation</p> <p> <math display="block">U_{\text{CNOT}} = \begin{bmatrix} 1 &amp; 0 &amp; 0 &amp; 0 \\ 0 &amp; 1 &amp; 0 &amp; 0 \\ 0 &amp; 0 &amp; 0 &amp; 1 \\ 0 &amp; 0 &amp; 1 &amp; 0 \end{bmatrix}</math> </p> <p> <math> A\rangle \text{ --- } \bullet \text{ --- }  A\rangle</math>  <math> B\rangle \text{ --- } \oplus \text{ --- }  B \oplus A\rangle</math> </p> <p>Operation of CNOT Gate on any Input status</p>	<p>1M</p> <p>1M</p> <p>1M</p> <p>2M</p>	5M

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DEPARTMENT OF Physics

SCHEME FOR VALUATION

Internal Test II

Semester & Section:

Date:

Question No.	Details of the answer	Marks Distribution	Total Marks
(7)	<u>Part D</u> Explanation of BCS theory Cooper pairs formation (2)	3M 2M	5M
(8)	SQUID Explanation $\left\{ \begin{array}{l} \text{DC SQUID} \\ \text{RF SQUID} \end{array} \right.$ Explanation with diagrams	2M 2M 1M	5M
(9)	<u>part E</u> Type-I Super conductors Type-II Super conductors Explanation with Graph (2)	2M 2M 1M	5M
(10)	Diagram Explanation up to $ \psi\rangle = \cos \frac{\theta}{2}  0\rangle + e^{i\phi} \sin \frac{\theta}{2}  1\rangle$ $1 \quad \left  \cos \frac{\theta}{2} \right ^2 + \left  \sin \frac{\theta}{2} \right ^2 = 1$	2M 2M 1M	5M

Staff

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Year : 2023-2024

Semester : Odd / Even ✓

Name of the Teacher : Nagashree. G

Designation : Asst. prof

Department : Physics

Sem/Branch

Subject Code

Subject

1. 1st/ AIML Applied physics Applied physics  
BPHYS102

2. ....

3. ....

	Initials at the End of the			
	1st Month	2nd Month	3rd Month	Semester
Staff	<u>GA</u> 28/10/23	<u>GA</u> 29/11/23	<u>GA</u> 21/12/23	<u>1st</u> <u>GA</u> 11/1/24
HOD	<u>KS</u>	<u>KS</u>	<u>KS</u>	<u>KS</u> <u>1st</u>
Principal	<u>Dr. Swamy</u>	<u>Dr. Swamy</u>	<u>Dr. Swamy</u>	<u>Dr. Swamy</u>

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Kanakapura Main Road, Bangalore-560001.

# ATTENDANCE

Sl. No.	Reg. No.	Name	Date										
			23/09/23	24/09/23	25/09/23	26/09/23	27/09/23	28/09/23	29/09/23	30/09/23	01/10/23	02/10/23	03/10/23
1	ICE23AI001	Aaliya Zainab	1	2	3	4	5	6	7	8	9	10	11
2	004	Ang p Sai	1	2	3	4	5	6	7	8	9	10	11
3	005	Ashik T K	1	2	3	4	5	6	7	8	9	10	11
4	006	Baxani R	1	2	3	4	5	6	7	8	9	10	11
5	008	Bhuvan shetty N	1	2	3	4	5	6	7	8	9	10	11
6	009	C M shivam	1	2	3	4	5	6	7	8	9	10	11
7	011	Deepak J	1	2	3	4	5	6	7	8	9	10	11
8	012	Gagana S	1	2	3	4	5	6	7	8	9	10	11
9	014	Gurudev M	1	2	3	4	5	6	7	8	9	10	11
10	015	Hari prasad B	1	2	3	4	5	6	7	8	9	10	11
11	016	Harshvardhan G L	1	2	3	4	5	6	7	8	9	10	11
12	017	Huzaiifa Ahmed S E	1	2	3	4	5	6	7	8	9	10	11
13	022	Koushik M	1	2	3	4	5	6	7	8	9	10	11
14	023	Kushal T C	1	2	3	4	5	6	7	8	9	10	11
15	024	M K chaudan	1	2	3	4	5	6	7	8	9	10	11
16	027	Meghana K R	1	2	3	4	5	6	7	8	9	10	11
17	029	Mohammed Junaid	1	2	3	4	5	6	7	8	9	10	11
18	031	Mohd. Saad Khan	1	2	3	4	5	6	7	8	9	10	11
19	037	Owais ulla Khan	1	2	3	4	5	6	7	8	9	10	11
20	039	S J yuvraj	1	2	3	4	5	6	7	8	9	10	11
21	043	Sai deepika B	1	2	3	4	5	6	7	8	9	10	11
22	046	Shausti shrikant Angadi	1	2	3	4	5	6	7	8	9	10	11
23	047	Sooraj P	1	2	3	4	5	6	7	8	9	10	11
24	049	Soumya P	1	2	3	4	5	6	7	8	9	10	11
25	053	Tanuja B	1	2	3	4	5	6	7	8	9	10	11
No. of Absents													
Initials													

Date		Attendance										
Day	Date	1	2	3	4	5	6	7	8	9	10	11
17	10/23	1	2	3	4	5	6	7	8	9	10	11
18	11/23	1	2	3	4	5	6	7	8	9	10	11
19	12/23	1	2	3	4	5	6	7	8	9	10	11
20	13/23	1	2	3	4	5	6	7	8	9	10	11
21	14/23	1	2	3	4	5	6	7	8	9	10	11
22	15/23	1	2	3	4	5	6	7	8	9	10	11
23	16/23	1	2	3	4	5	6	7	8	9	10	11
24	17/23	1	2	3	4	5	6	7	8	9	10	11
25	18/23	1	2	3	4	5	6	7	8	9	10	11
26	19/23	1	2	3	4	5	6	7	8	9	10	11
27	20/23	1	2	3	4	5	6	7	8	9	10	11
28	21/23	1	2	3	4	5	6	7	8	9	10	11
29	22/23	1	2	3	4	5	6	7	8	9	10	11
30	23/23	1	2	3	4	5	6	7	8	9	10	11
31	24/23	1	2	3	4	5	6	7	8	9	10	11
32	25/23	1	2	3	4	5	6	7	8	9	10	11
33	26/23	1	2	3	4	5	6	7	8	9	10	11
34	27/23	1	2	3	4	5	6	7	8	9	10	11
35	28/23	1	2	3	4	5	6	7	8	9	10	11
36	29/23	1	2	3	4	5	6	7	8	9	10	11
37	30/23	1	2	3	4	5	6	7	8	9	10	11
38	31/23	1	2	3	4	5	6	7	8	9	10	11
39	01/24	1	2	3	4	5	6	7	8	9	10	11
40	02/24	1	2	3	4	5	6	7	8	9	10	11
41	03/24	1	2	3	4	5	6	7	8	9	10	11
42	04/24	1	2	3	4	5	6	7	8	9	10	11
43	05/24	1	2	3	4	5	6	7	8	9	10	11
44	06/24	1	2	3	4	5	6	7	8	9	10	11
45	07/24	1	2	3	4	5	6	7	8	9	10	11
46	08/24	1	2	3	4	5	6	7	8	9	10	11
47	09/24	1	2	3	4	5	6	7	8	9	10	11
48	10/24	1	2	3	4	5	6	7	8	9	10	11
49	11/24	1	2	3	4	5	6	7	8	9	10	11
50	12/24	1	2	3	4	5	6	7	8	9	10	11









# CITY ENGINEERING COLLEGE

Approved by AICTE New Delhi & Affiliated by VTU, Belagavi  
Doddakallasandra, Off Kanakapura Main Road,  
Next to Gokulam Apartment, Bangalore - 560 062.



## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

### CIRCULAR

**Ref. No: CEC/CSE/DAC/2023-2024/02**

**Date: 10-02-2024**

All the members of Department Advisory Committee are informed to attend a meeting which will be held as follows

Date: 16/02/2024  
Time: 10.30 AM  
Venue: LAB C108

#### Agenda:

- Conducting international conference
- Discussion on conducting certification courses and opportunities that arise
- Conduction of Project Exhibition
- Industrial Visit
- Conduction of guest lectures/ workshops

**Dr. Sowmya Naik P T**

**HOD**



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## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

### Department Advisory Committee Meeting

Date: 16/02/2024

Time: 10.30 AM

Venue: Room No. C108

#### DAC Members Present:

Sl. No	Member Name	Designation	Role	Sign
1	Dr. Sowmya Naik P T	HOD	Convenor	
2	Dr. Narayana Swamy Ramaiah	Professor	Member	
3	Mrs. Ambika P R	Assistant Professor	Co-Convenor	
4	Mrs. Laxmi M C	Assistant Professor	Member	
5	Mr. Girish G A	Assistant Professor	Member	
6	Mrs. Archana Bhat	Assistant Professor	Member	
7	Mrs. Sangeeta Uranakar	Assistant Professor	Member	
8	Mrs. Swetha A	Assistant Professor	Member	
9	Mrs. Shruthi B S	Assistant Professor	Member	
10	Mr. Narasimha Prasad K L	Project Manager, Accenture Services Pvt. Ltd	Alumni (Industry Expert)	
11	Ms. Deepika R	SAP functional consultant, Exikon Technology Private Limited	Alumni	

The Department Advisory Committee meeting was conducted at Department of CSE, on 16th February, 2024, at 10:30 am.

#### Agenda of the Meeting:

- Conducting international conference
- Discussion on conducting certification courses and opportunities that arise
- Conduction of Project Exhibition
- Industrial Visit
- Conduction of guest lectures/ workshops



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## Minutes of Meeting:

Department Advisory Committee meeting and provided an overview of the department, highlighting student achievements, result analysis, and faculty accomplishments and contributions. The members discussed suggestions for improvement and the meeting agenda.

The Committee proposed the following inputs for the agenda:

- Organize a 2-day international conference and guest lecture sessions on recent technological trends for students.
- Encourage students to undertake certification courses or MOOCs to enhance their skills.
- Arrange industrial visits for students of each year separately.
- Conduct an intercollegiate project exhibition, allowing final-year students to showcase their projects.
- Increase awareness of current technology through workshops, guest lectures, and hands-on sessions.

Dr. Sowmya Naik P T

**HOD & Convenor**



# ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ

("ವಿ ಟ ಯು ಅಧಿನಿಯಮ 1994"ರ ಅಡಿಯಲ್ಲಿ ಕರ್ನಾಟಕ ಸರ್ಕಾರದಿಂದ ಸ್ಥಾಪಿತವಾದ ರಾಜ್ಯ ವಿಶ್ವವಿದ್ಯಾಲಯ)

## VISVESVARAYA TECHNOLOGICAL UNIVERSITY

(State University of Government of Karnataka Established as per the VTU Act, 1994)

Phone : 0831-2498100 / 2405468

Fax : 0831-2405467

Email : registrar@vtu.ac.in

Web : https://vtu.ac.in

Reference: VTU/BGM/AC /2023-24/6085

Dated: 2 FEB 2024

### NOTIFICATION

**Subject:** Tentative Academic Calendar of VIII semester B.E./B.Tech./B.Arch/B.Plan programs regarding...

**Reference:** Dean Faculty of Engineering Approval Dated: 14.01.2024  
The Hon'ble Vice Chancellor's approval dated: 14.01.2024

The Tentative academic calendar concerned to VIII semesters' of B.E./B.Tech./B.Arch/B.Plan programs for the academic year 2023-24 is hereby notified as follows;

	VIII semester B.E./B.Tech.,	VIII semester B. Plan	VIII semester B.Arch.
Commencement of the Semester	12.02.2024	26.02.2024	01.02.2024
Commencement of Classes	12.02.2024	26.02.2024	01.02.2024
Last Working Day of the Semester	11.05.2024	25.05.2024	25.05.2024
Practical Examination	-----	-----	27.05.2024 To 01.06.2024
Theory Examinations	13.05.2024 To 21.05.2024	03.06.2024 To 12.06.2024	03.06.2024 To 27.06.2024
Internship/Practical Exam for Lateral Entry Students	----	----	----
Internship Viva Voce/ Project viva	23.05.2024 To 30.05.2024	----	----
Commencement of NEXT Semester	----	----	----

**Please Note:**

- The academic sessions for semesters should commence on the **date mentioned** above.

- If required, the college can plan to have extra classes on the 1st and 3rd Saturdays and Sundays to complete academic activities within the academic duration mentioned.
- The faculty/staff shall be available to undertake any work assigned by the university.
- Notification regarding the Calendar of Events relating to the conduct of University **Examinations** will be issued by the Registrar (Evaluation) from time to time.
- Academic Calendar **may be modified** based on guidelines/directions issued in the future by UGC/AICTE/State Government.
- Autonomous Colleges must adhere to the Academic Calendar as well. Any modifications to the academic terms and examination schedule that Autonomous Colleges choose to make can only be made with the University's concurrence.
- If any suggestions/clarification please email to [-sbhalbhavi@vtu.ac.in](mailto:sbhalbhavi@vtu.ac.in)

The Principals of Non-Autonomous, Constituent, and Autonomous Engineering Colleges and chairpersons of the University departments are hereby informed to bring the academic calendar to the notice of all concerned.

Sd/-

REGISTRAR

To,

1. The Principals of all Non-autonomous/ constituent /Autonomous Engineering Colleges under the ambit of VTU Belagavi.
2. The chairperson, of the Department of Mechanical Engineering /Civil Engineering /Computer Science and Engineering & Communication Electronics Engineering of the University.

Copy to.

1. To the Hon'ble Vice-Chancellor through the secretary to VC, VTU Belagavi for information
2. The Registrar (Evaluation), VTU Belagavi for information and needful.
3. The Regional Directors (I/c) of all the regional offices of VTU for circulation.
4. The Director ITI SMU, VTU Belagavi for information and to make arrangements to upload the Academic Calendar on the VTU web portal.
5. **The Director of Physical Education, VTU Belagavi for information**
6. **The Director, Central Placement Cell, VTU Belagavi for information**
7. **The Special Officer Library, VTU Belagavi for information**
8. All the concerned Special Officer/s and Caseworker/s of the academic section, VTU, Belagavi
9. Office copy

Re 02/02/24 B.E  
REGISTRAR  
7



# ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ

("ವಿ ಬ ಯು ಅಧಿನಿಯಮ 1994"ರ ಅಡಿಯಲ್ಲಿ ಕರ್ನಾಟಕ ಸರ್ಕಾರದಿಂದ ಸ್ಥಾಪಿತವಾದ ರಾಜ್ಯ ವಿಶ್ವವಿದ್ಯಾಲಯ)

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Email : registrar@vtu.ac.in

Web : https://vtu.ac.in

Ref. VTU/BOS/AC-MBA/2023-24/ 6901

Dated: 27 MAR 2024

### Revised-NOTIFICATION

**Subject:** Revised tentative- IV semester B.E./B.Tech., programs academic calendar regarding...

- Reference:**
01. VTU/BOS/AC2023-24/6540, Dated 27.02.2024
  02. VTU/Exam/QPDS/CW(2)/2023-24/1745, Dated; 21.03.2024
  03. VTU/Exam/QPDS/CW(2)/2023-24/1687, dated: 12.03.2024
  04. Hon'ble Vice-Chancellor's approval Dated:26.03.2024

Based on the examination timetable referred at 2 and 3, the commencement date for 4<sup>th</sup> semester B.E./B.Tech., program has been re-scheduled to 22.04.2024 and the academic calendar for 4<sup>th</sup> semester B.E./B.Tech., programs are published as below:

	For Regular Admitted Students, Lateral Entry (Diploma Graduate) Students and Working Professional (Diploma Graduates)	Remarks (Only applicable for Students admitted under working professional Category)
Commencement of the 4 <sup>th</sup> Semester and class	22.04.2024	The 3rd-semester Examination Time Table for Working Professionals will be published in the first week after the commencement of the 4th-semester classes
Last Working day of the Semester	07.08.2024	
Practical Examination	08.08.2024 to 17.08.2024	
Theory Examinations	19.08.2024 to 12.09.2024	
Commencement of 5 <sup>th</sup> Semester	16.09.2024	

The principals of all the colleges are hereby informed to bring the content of the NOTIFICATION to the notice of all concerned.

Sd/-

REGISTRAR

#### Please Note:

- If required, the college can plan to have extra classes on 1<sup>st</sup> and 3<sup>rd</sup> Saturdays and Sundays to complete academic activities within the academic duration mentioned. For regular and lateral entry, student academic activities should be conducted as per the academic calendar mentioned above.
  - The college has to prepare a flexible timetable for the students admitted under the category of **working professionals** so that they can attend the classes. However, as per AICTE guidelines, 60% of the classes can be held in **OFFLINE** mode and 40% of the classes can be conducted in **ONLINE** mode.

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- If required, the college can plan to have extra classes on the 1<sup>st</sup> and 3<sup>rd</sup> Saturdays and Sundays to complete the academic activities of the students admitted under the working professionals' category within the academic duration mentioned.
- The faculty handling the classes for working professionals has to maintain the attendance record properly and produce it whenever the university asks for it.
- Notification regarding the Calendar of Events relating to the conduct of University Examinations will be issued by the Registrar (Evaluation) from time to time.
- Academic Calendar **may be modified** based on guidelines/directions issued in the future by UGC/AICTE/State Government.
- The faculty/staff shall be available to undertake any work assigned by the university.
- If any suggestions/clarification please email-[registrar@vtu.ac.in](mailto:registrar@vtu.ac.in)

To,

The Principals of all the Engineering Colleges under the ambit of the university  
The Chairpersons/Program coordinators of the University Departments at Kalaburgi,  
Bengaluru, Mysuru and Belagavi

Copy to.

1. To the Hon'ble Vice-Chancellor through the secretary to VC, VTU Belagavi for information
2. The Registrar (Evaluation), VTU Belagavi for information and needful.
3. The Regional Directors (I/c) of all the regional offices of VTU for circulation.
4. The Director ITI SMU, VTU Belagavi for information and to make arrangements to upload the Academic Calendar on the VTU web portal.
5. The Director of Physical Education, VTU Belagavi for information
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9. Office copy

R  
27/03/24 Ad.E  
REGISTRAR  
7.



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Web : https://vtu.ac.in

Ref. VTU/BOS/AC-PG-6<sup>th</sup> sem BE/2023-24/ 239

Dated: 15 APR 2024

## NOTIFICATION

**Subject:** Tentative Academic Calendar of - IV semester MCA/M.Tech/M/Arch/M.Plan and VI semester B.E./B.Tech., programs academic calendar regarding...

**Reference:** 01. Dean faculty of Engineering approval dated 14.04.2024  
02. The Hon'ble Vice-Chancellor's approval date: 15.04.2024

The tentative Academic Calendar of - IV semester MCA/M.Tech/M/Arch/M.Plan and VI semester B.E./B.Tech., programs are published as below:

	IV semester MCA	IV semester M.Tech.	IV Semester M.Arch.	IV Semester M.Plan.	VI semester B.E./ B.Tech.
Commencement of the Semester	22.04.2024	22.04.2024	22.04.2024	22.04.2024	29.04.2024
Commencement of Classes	22.04.2024	22.04.2024	22.04.2024	22.04.2024	29.04.2024
Last Working day of the Semester	27.07.2024	27.07.2024	27.07.2024	27.07.2024	31.07.2024
Practical / Viva- Examination/Inter nship Viva Voce	28.07.2024 To 29.07.2024				01.08.2024 To 10.08.2024
Theory Examinations	01.08.2024 To 23.08.2024	01.08.2024 To 23.08.2024	29.07.2024 To 02.08.2024	01.08.2024 To 23.08.2024	12.08.2024 To 14.09.2024
Project viva	Will be announced after the submission of the Thesis				---
Submission of the report to university	13.07.2024 To 27.07.2024	01.08.2024 To 20.08.2024	01.08.2024 To 10.08.2024	01.08.2024 To 10.08.2024	----
Commencement of NEXT Semester	---	---	---	---	## 23.09.2024

## Commencement of the swapped VII/VIII semester. 50% strength of the students may take up an Internship (VIII sem) immediately after 14.09.2024 and the remaining 50% strength of the students may take up VII semester (23.09.2024)

The principals of all the colleges are hereby informed to bring the content of the NOTIFICATION to the notice of all concerned.

Sd/-

REGISTRAR

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9. Office copy

*R. S. Srinivas*  
**REGISTRAR**  
*J.*

	CITY ENGINEERING COLLEGE, BENGALURU-560061. ACADEMIC CALENDAR 2023-24 (EVEN SEM)													
	FEB 2024		MARCH 2024		APRIL 2024		MAY 2024		JUNE 2024		JULY 2024		AUGUST 2024	
DAY	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT
MON					1	1 <sup>st</sup> to 25 <sup>th</sup> April 24 – Theory Examination – Vth Sem					1	1 <sup>st</sup> to 11 <sup>th</sup> July 24 Practical Exam II Sem B. E		
TUE					2						2	2 <sup>nd</sup> to 4 <sup>th</sup> July 24 Test I – IV Sem B. E		
WED					3		1	Holiday – May Day		VI Sem - Display of Ist IA Marks on NB and ERP Communication to parents	3	3 <sup>rd</sup> to 5 <sup>th</sup> July 24, II Test for VI Semester		
THU	1				4		2	Sports Day			4			1
FRI	2		1		5		3	Sports Day			5			2
SAT	3	1st Saturday Holiday	2	1st Saturday Holiday	6	1st Saturday Holiday	4	1st Saturday Holiday	1	1st Saturday Holiday	6	1st Saturday Holiday	3	1st Saturday Holiday
SUN	4		3		7		5		2		7		4	
MON	5		4		8		6		3	3 <sup>rd</sup> June to 20 <sup>th</sup> June 2024 Theory Examination of I Sem MBA/MCA/M. Tech	8		5	
TUE	6		5	5 <sup>th</sup> , 6 <sup>th</sup> , 7 <sup>th</sup> Mar 24 Test 2- III Sem, Test 3-V SEM	9	Holiday – Chandramana Ugadi	7	7 <sup>th</sup> May 24, 3 <sup>rd</sup> Test VIII Semester B. E	4		9		6	
WED	7		6	Commencement of Classes of II Sem B. E	10		8	Ethnic Day	5		10	IV Semester - Display of Ist Test IA Marks on NB and ERP Communication to parents	7	
THU	8		7		11	Holiday – Qutub-e-Ramzan	9	College Day	6		11	VI Sem - Display of 2 <sup>nd</sup> IA Marks on NB and ERP Communication to parents	8	
FRI	9		8	Holiday -Maha Shiva Ratri	12		10	Holiday – Basava Jayanthi	7		12		9	
SAT	10		9	Last Working Day of classes III Sem B. E	13	Alumni Meet	11	Last Working Day of the Semester VIII Sem B. E And Farewell for VIII Semester Students	8		13		10	
SUN	11		10		14		12		9		14		11	
MON	12	Commencement of Classes of I Sem MBA/MCA/M.Tech and VIII Sem B. E	11		15		13	13 <sup>th</sup> to 21 <sup>st</sup> May 24 Theory Examinations – VIII Sem B.E	10		15	15 <sup>th</sup> July to 10 <sup>th</sup> Aug 24- Theory Exam- II Sem B. E	12	
TUE	13	Industrial Visit – 8 <sup>th</sup> Sem (CS/IS/AIML), B.E	12		16	16 <sup>th</sup> to 18 <sup>th</sup> April 24, I-Test IInd Semester	14		11		16		13	
WED	14		13	13 <sup>th</sup> to 27 <sup>th</sup> Mar 24 Theory Examination -III Sem B. E	17		15		12		17	Holiday - Muharram	14	
THU	15		14		18		16		13		18		15	Holiday – Independence Day
FRI	16		15		19	MBA/MCA/M.Tech Industrial Visit	17		14		19		16	
SAT	17	3rd Saturday Holiday	16	3rd Saturday Holiday Last Working Day of classes V Sem B. E	20	3rd Saturday Holiday	18	3rd Saturday Holiday	15	3rd Saturday Holiday	20	3rd Saturday Holiday	17	3rd Saturday Holiday
SUN	18		17		21		19		16		21		18	
MON	19	Industrial Visit – 5 <sup>th</sup> Sem (CS/IS/AIML), B. E	18		22		20	Commencement of classes of IV Semester B. E	17	Holiday - Bakrid	22		19	Commencement of Classes III Sem B. E
TUE	20		19		23		21	III Test MBA/MCA/M.Tech	18	18 <sup>th</sup> to 20 <sup>th</sup> June 24, II- Test IInd Semester	23		20	20 <sup>th</sup> to 22 <sup>nd</sup> Aug 24 Test II – IV Sem B. E
WED	21		20	20 <sup>th</sup> to 30 <sup>th</sup> Mar 24 Practical Examination – Vth Sem B. E	24	Display of Ist Test IA Marks on NB and ERP Communication to parents	22		19		24		21	
THU	22		21		25	25 <sup>th</sup> to 27 <sup>th</sup> April 24, II Test MBA/MCA/M.Tech and 25 <sup>th</sup> April VIII Semester B. E	23	23 <sup>rd</sup> to 30 <sup>th</sup> May 24, Internship Viva-voce/Project Viva- VIII Semester	20		25		22	
FRI	23	23 <sup>rd</sup> Feb to 5 <sup>th</sup> Mar 2024 Practical Exam B.E I Sem B. E	22		26	“Battle of Science” for IInd Sem Students	24		21		26		23	
SAT	24		23	“Talents Day” for IInd Sem Students	27		25	Last Working Day of I Sem MBA/MCA/M. Tech	22	Graduation Day	27		24	
SUN	25		24		28		26		23		28		25	
MON	26		25	25 <sup>th</sup> to 27 <sup>th</sup> March 24, I Test MBA/MCA/M.Tech and 25 <sup>th</sup> March VIII Semester B. E	29	Commencement of Classes of VI Semester B. E	27	27 <sup>th</sup> to 31 <sup>st</sup> May 24 Practical Examination/Internship Viva Voce/Project Viva of I Sem MCA/ M. Tech	24		29		26	Display of 2 <sup>nd</sup> Test IA Marks on NB and ERP Communication to parents
TUE	27		26		30		28	28 <sup>th</sup> to 30 <sup>th</sup> MAY 24, I Test for VI Semester	25	Commencement of Classes of II Sem MBA/MCA/M.Tech	30	International Conference	27	
WED	28		27				29		26	Display of IInd IA Marks on NB and ERP Communication to parents	31	International Conference	28	

THU	29		28			30		27			29			
FRI			29	Holiday – Good Friday				31			28	PTM – IInd Semester	30	PTM – IVth Semester
SAT			30	30 <sup>th</sup> Mar to 12 <sup>th</sup> April 24, Practical Examination – III Sem B. E						29	Last Working Day of The II Semester B. E		31	Last Working Day of the semester IV Semester
SUN			31							30				

Note: 1. Students Feedback should be taken immediately after the Test. 2. There will be no additional circular will be sent for dates mentioned for Events in CoE



**CITY ENGINEERING COLLEGE, BENGALURU-560061.**  
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**  
**ACADEMIC CALENDAR 2023-24 (EVEN SEM)**

FEB 2024		MARCH 2024		APRIL 2024		MAY 2024		JUNE 2024		JULY 2024		AUGUST 2024		
DAY	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT
MON					1	1 <sup>st</sup> to 25 <sup>th</sup> April 24 – Theory Examination – Vth Sem		VIII SEM – Industrial Visit			1	1 <sup>st</sup> to 11 <sup>th</sup> July 24 Practical Exam II Sem B. E		
TUE					2					Hackathon	2	2 <sup>nd</sup> to 4 <sup>th</sup> July 24 Test I – IV Sem B. E		
WED					3	3 <sup>rd</sup> to 5 <sup>th</sup> April 24 Faculty development program	1	Holiday – May Day		VI Sem - Display of Ist IA Marks on NB and ERP Communication to parents	3	3 <sup>rd</sup> to 5 <sup>th</sup> July 24, II Test for VI Semester		
THU	1				4		2	Sports Day			4			1
FRI	2		1		5		3	Sports Day			5			2
SAT	3	1st Saturday Holiday	2	1st Saturday Holiday	6	1st Saturday Holiday	4	1st Saturday Holiday	1	1st Saturday Holiday	6	1st Saturday Holiday	3	1st Saturday Holiday
SUN	4		3		7		5		2		7		4	
MON	5		4		8		6		3	3 <sup>rd</sup> June to 20 <sup>th</sup> June 2024 Theory Examination of I Sem MBA/MCA/M. Tech	8	Guest Lecture – VI SEM	5	
TUE	6		5	5 <sup>th</sup> , 6 <sup>th</sup> , 7 <sup>th</sup> Mar 24 Test 2- III Sem, Test 3-V SEM	9	Holiday – Chandramana Ugadi	7	7 <sup>th</sup> May 24, 3 <sup>rd</sup> Test VIII Semester B. E	4		9		6	
WED	7		6	Commencement of Classes of II Sem B. E	10		8	Ethnic Day	5		10	IV Semester - Display of Ist Test IA Marks on NB and ERP Communication to parents	7	
THU	8		7		11	Holiday – Qutub-e-Ramzan	9	College Day	6		11	VI Sem - Display of 2 <sup>nd</sup> IA Marks on NB and ERP Communication to parents	8	
FRI	9		8	Holiday -Maha Shiva Ratri	12		10	Holiday – Basava Jayanthi	7		12		9	
SAT	10		9	Last Working Day of classes III Sem B. E	13	Alumni Meet	11	Last Working Day of the Semester VIII Sem B. E And Farewell for VIII Semester Students	8	PTM – VI SEM	13	PTM – IV SEM	10	
SUN	11		10		14		12		9		14		11	
MON	12	Commencement of Classes of I Sem MBA/MCA/M.Tech and VIII Sem B. E	11		15	15 <sup>th</sup> and 16 <sup>th</sup> April 24 International conference	13	13 <sup>th</sup> to 21 <sup>st</sup> May 24 Theory Examinations – VIII Sem B.E	10		15	15 <sup>th</sup> July to 10 <sup>th</sup> Aug 24- Theory Exam- II Sem B. E	12	Guest Lecture – IV SEM
TUE	13	Industrial Visit – 8 <sup>th</sup> Sem (CS/IS/AIML), B.E	12		16	16 <sup>th</sup> to 18 <sup>th</sup> April 24, I-Test IInd Semester/ International conference	14	VI SEM – Industrial Visit	11		16		13	
WED	14		13	13 <sup>th</sup> to 27 <sup>th</sup> Mar 24 Theory Examination -III Sem B. E	17		15		12		17	Holiday - Muharram	14	
THU	15		14		18		16		13	13 <sup>th</sup> to 14 April 24 Work Shop for VI Sem (AI Product development)	18		15	Holiday – Independence Day
FRI	16		15		19	MBA/MCA/M.Tech Industrial Visit	17		14		19		16	
SAT	17	3rd Saturday Holiday	16	3rd Saturday Holiday Last Working Day of classes V Sem B. E	20	3rd Saturday Holiday	18	3rd Saturday Holiday	15	3rd Saturday Holiday	20	3rd Saturday Holiday	17	3rd Saturday Holiday
SUN	18		17		21		19		16		21		18	
MON	19	V SEM - Industrial Visit	18		22		20	Commencement of classes of IV Semest B. E	17	Holiday - Bakrid	22		19	Commencement of Classes III Sem B. E
TUE	20		19		23		21	III Test MBA/MCA/M.Tech	18	18 <sup>th</sup> to 20 <sup>th</sup> June 24, II-Test IInd Semester	23	20 <sup>th</sup> to 22 <sup>nd</sup> Aug 24 Test II – IV Sem B. E	20	
WED	21		20	20 <sup>th</sup> to 30 <sup>th</sup> Mar 24 Practical Examination – Vth Sem B. E	24	Display of Ist Test IA Marks on NB and ERP Communication to parents	22		19		24		21	
THU	22	Symposium-2024	21		25	25 <sup>th</sup> to 27 <sup>th</sup> April 24, II Test MBA/MCA/M.Tech and 25 <sup>th</sup> April VIII Semester B. E	23	23 <sup>rd</sup> to 30 <sup>th</sup> May 24, Internship Viva-voce/Project Viva- VIII Semester	20		25		22	
FRI	23	23 <sup>rd</sup> Feb to 5 <sup>th</sup> Mar 2024 Practical Exam B.E I Sem B. E	22		26	"Battle of Science" for IInd Sem Students	24		21		26		23	
SAT	24	III - Industrial Visit	23	"Talents Day" for IInd Sem Students	27		25	Last Working Day of I Sem MBA/MCA/M. Tech	22	Graduation Day	27		24	
SUN	25		24		28		26		23		28		25	
MON	26		25	25 <sup>th</sup> to 27 <sup>th</sup> March 24, I Test MBA/MCA/M.Tech and 25 <sup>th</sup> March VIII Semester B. E	29	Commencement of Classes of VI Semester B. E	27	27 <sup>th</sup> to 31 <sup>st</sup> May 24 Practical Examination/Internship Viva Voce/Project Viva of I Sem MCA/ M. Tech	24		29		26	Display of 2 <sup>nd</sup> Test IA Marks on NB and ERP Communication to parents
TUE	27		26		30	Project Exhibition for VIII SEM	28	28 <sup>th</sup> to 30 <sup>th</sup> MAY 24, I Test for VI Semester	25	Commencement of Classes of II Sem MBA/MCA/M.Tech	30	International Conference	27	
WED	28		27				29		26	Display of IInd IA Marks on NB and ERP Communication to parents	31	International Conference	28	
THU	29		28				30		27				29	
FRI			29	Holiday – Good Friday			31		28	PTM – IInd Semester			30	PTM – IVth Semester
SAT			30	30 <sup>th</sup> Mar to 12 <sup>th</sup> April 24, Practical Examination – III Sem B. E		Alumni Interaction		IV SEM – Industrial Visit	29	Last Working Day of The II Semester B. E			31	Last Working Day of the semester IV Semester
SUN			31						30					

Note: 1. Students Feedback should be taken immediately after the Test. 2. There will be no additional circular will be sent for dates mentioned for Events in CoE



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ACADEMIC YEAR: 2023-24 (Even)

## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING COURSE PREFERENCE

Name of the Faculty: *Dr. Sowmya*  
Designation: *Professor & Head.*

Sl. No	Course Code and Name	Year/Semester
1.	18CS81 - IOT	4 <sup>th</sup> / 8 <sup>th</sup>
2.	22RMI16 - RSM	I / I <sup>st</sup> Sem

  
Signature of Faculty



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ACADEMIC YEAR: 2023-24

## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

### COURSE PREFERENCE

Name of the Faculty: *Byangappa B. Demannaiah*  
Designation: *Asst professor*

Sl. No	Course Code and Name	Year/Semester
<i>(1)</i>	<i>DBMS BCS403</i>	<i>II/IV</i>
<i>(2)</i>	<i>ADA BCS401</i>	<i>II/IV</i>
<i>(3)</i>	<i>DBMS-LAB</i>	<i>II/IV</i>

Signature of Faculty





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ACY 23-24 (EVEN)

## Department of Computer Science and Engineering COURSE ALLOCATION

Sl.No	Faculty Name	Subject /Lab	Subject code	Sem	Section	Signature
1	Dr. Sowmya	IOT	18CS81	VIII	B	
		Research methodology	22RMI16	M.Tech (I SEM)	-	
2	Dr. Narayana Swamy Ramaiah	Microcontrollers	BCS402	IV	C	
3	Mr. Girish G A	Design and analysis of algorithms	BCS401	IV	B, C	
		Design and analysis of algorithms Lab	BCSL404	IV	B1, B2, B3	
		Internet of Things and Applications	22SCS14	M.Tech (I SEM)		
		Internet of Things Laboratory	22SCS17	M.Tech (I SEM)		
4	Mr. Ramesh B	Advanced Java	IS	IV	A	
		Principles of Programming using C Lab	BPOP203	II	E1, E2, E3 F1, F2, F3	
5	Dr. Ambika PR	Data science and visualization	21CS644	VI	A	
		Mini project	21CSMP67	VI	A	
		Fundamentals of data sciences	22SCS12	M.Tech (I SEM)		
6	Mrs. Laxmi M C	Software engineering and project management	21CS61	VI	A, C	
		Mini project	21CSMP67	VI	C	
		Advanced Algorithm	22SCS15	M.Tech (I Sem)		
7	Mrs. Archana Bhat	Data science and visualization	21CS644	VI	B, C	
		Mini project	21CSMP67	VI	B	
		Mathematics course stream	22SCS11	M.Tech (I SEM)	-	
8	Mrs. Sangeetha Rao	Conservation of Natural resources(OE)	21CV654	VI	C	
		Design and analysis of algorithms Lab	BCSL404	IV	B1, B2, B3 C1, C2, C3	



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9	Mrs. Tejaswini B N	Conservation of natural Resources(OE)	21CV654	VI	A, B	<i>Tejaswini</i>
		Design and analysis of algorithms Lab		IV	A1, A,2, A3	
10	Mrs. Sangeetha S Urankar	Design and analysis of algorithms	BCS401	IV	A	<i>Sangeetha</i>
		Design and analysis of algorithms Lab	BCSL404	IV	A1, A2, A3 C1, C2, C3	
11	Mrs. Shruthi Vijay	Database management systems Lab	BCS403	IV	A1, A2, A3 B1, B2, B3 C1, C2,C3	<i>Shruthi</i>
12	Mr. Gangappa B Demannavar	Database management systems	BCS403	IV	A, C	<i>Gangappa</i>
		Database management systems Lab	BCS403	IV	C1, C2,C3	
13	Mrs. Swetha A	Computer graphics and fundamentals image processing	21CS63	VI	A, B	<i>Swetha</i>
		Computer graphics and image processing Lab	21CSL66	VI	B1, B2, B3	
14	Mrs. Tara V K	Universal human values	BUHK408	IV	A, B, C	<i>Tara V. K</i>
		Microcontrollers Lab	BCS402	IV	A1, A2, A3 B1, B2, B3 C1, C2,C3	
15	Mrs. Shruthi B S	IOT	18CS81	VIII	A	<i>Shruthi B S</i>
		Computer graphics and image processing Lab	21CSL66	VI	A1,A2,A3 B1,B2,B3	
16	Mrs. Hina Nazneen	Software engineering and project management	21CS61	VI	B	<i>Hina</i>
		Principles of Programming using C Lab	BPOP203	II	E1, E2, E3 F1, F2, F3	
17	Mrs. Vibhavi R N	Full stack development	21CS62	VI	A, B	<i>Vibhavi</i>



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	Mrs. Vibhavi R N	Full stack development Lab	21CS62	VI	B1, B2, B3	<i>Vibhavi</i>
18	Ms. Shravya	Full stack development	21CS62	VI	C	<i>Shravya</i>
		Full stack development Lab	21CS62	VI	A1, A2, A3 C1, C2, C3	
19	Mrs. Krishnaveni K	Microcontrollers	BCS402	IV	A, B	<i>Krishnaveni</i>
		Microcontrollers Lab	BCS402	IV	A1, A2, A3	
20	Ms. Menaka C N	Green IT and Sustainability	BCS456A	IV	A, B, C	<i>Menaka</i>
		Full stack development Lab	21CS62	VI	A1, A2, A3 B1, B2, B3 C1, C2, C3	
21	Mr. Mahadeva Prasad H.M	Computer graphics and fundamentals image processing	21CS63	VI	C	<i>M.P.</i>
		Computer graphics and image processing Lab	21CSL66	VI	A1, A2, A3 C1, C2, C3	
22	Mrs. Spoorthi M	Principles of Programming using C	BPOP203	II	D, E, F	<i>Spoorthi</i>
		Principles of Programming using C Lab	BPOP203	II	D1, D2, D3	
23	Mrs. Ashwini J K	Database management systems	BCS403	IV	B	<i>Ashwini</i>
		Database management systems Lab	BCS403	IV	A1, A2, A3 B1, B2, B3	
24	Monisha G B	Computer graphics and image processing Lab	21CSL66	VI	C1, C2, C3	<i>Monisha</i>
		Introduction to Python Programming Lab	BPLCK205B	II	B1, B2, B3 C1, C2, C3	

*[Signature]*

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING  
EVEN 2023-2024 TIME TABLE

BSEMESTER: IV CSE 'A' SEC CBCS


2022 SCHEME


CLASS ROOM: C201

W.E.F : 22-04-2024

DAY	1	2	TEA	3	4	LUNCH	5	6	7	
	9:00 - 10:00	10:00 - 11:00		11:15 - 12:15	12:15 - 1:15		1:15 - 2:00	2:00 - 3:00	3:00 - 4:00	4:00 - 5:00
MON	BCS403	BBOC407	<b>B R E A K</b>	BCS401	BUHK408	<b>L U N C H</b>	LIBRARY			
TUE	BCS456A	BCS402		BCS405A	BCS403		LAB (A1-ADA/A2-MC/A3-DBMS)			
WED	LAB (A2-ADA/A3-MC/A1-DBMS)			BCS402	BCS405A		PE/YOGA/NSS	DEPT ACTIVITIES		
THU	BCS405A	BCS401		BCS403	PE		LAB (A3-ADA/A1-MC/A2-DBMS)			
FRI	BCS401	BBOC407		BCS402	BCS405A		PROCTORING			
SAT										

Sl. No	Course Code	Course Name	Faculty Name
1	BCS401	Analysis & Design of Algorithms	PROF. SANGEETA U
2	BCS402	Microcontrollers	PROF. KRISHNAVENI K
3	BCS403	Database Management Systems	PROF. ASHWINI J K
4	BCSL404	Analysis & Design of Algorithms Lab	PROF. SANGEETA U / PROF. TEJASWINI
5	BCS405A	Discrete Mathematical Structures	PROF. REKHA
6	BCS456A	Green IT and Sustainability	PROF. MENAKA C N
7	BBOC407	Biology For Computer Engineers	PROF. MEGHANA
8	BUHK408	Universal human values course	PROF. TARA V K
9	BNSK459/ BPEK459/ BYOK459	National Service Scheme (NSS)/ Physical Education (PE) (Sports and Athletics)/ Yoga	MR. RANGASWAMY

  
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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING  
EVEN 2023-2024 TIME TABLE

SEMESTER: IV CSE 'B' SEC CBCS

2022 SCHEME

CLASS ROOM: C202

W.E.F: 22-04-2024

DAY	1	2	TEA	3	4	LUNCH	5	6	7
	9:00 - 10:00	10:00 - 11:00		11:15 - 12:15	12:15 - 1:15		1:15 - 2:00	2:00 - 3:00	3:00 - 4:00
MON	BCS402	BCS405A	<b>B R E A K</b>	BCS403	BCS407	<b>L U N C H</b>	LAB (B1- ADA/ B2 - MC / B3 - DBMS)		
TUE	BCS407	BCS405A		BCS401	BCS403		LIBRARY		
WED	BCS405A	BCS401		LAB (B2- ADA/ B3 - MC / B1 - DBMS)			BCS402	PE/YOGA/NSS	
THU	LAB (B3 - ADA/ B1 - MC / B2 - DBMS)			BUHK408	BCS402		DEPT ACTIVITIES		
FRI	BCS403	BCS456A		BCS401	BCS405A		PROCTORING		
SAT									

Sl. No	Course Code	Course Name	Faculty Name
1	BCS401	Analysis & Design of Algorithms	PROF. GIRISH G A
2	BCS402	Microcontrollers	PROF. KRISHNAVENI K
3	BCS403	Database Management Systems	PROF. GANGAPPA. D
4	BCSL404	Analysis & Design of Algorithms Lab	PROF. GIRISH G A/ PROF. SANGEETA RAO
5	BCS405A	Discrete Mathematical Structures	PROF. VANITHA
6	BCS456A	Green IT and Sustainability	PROF. MENAKA C N
7	BBOC407	Biology For Computer Engineers	PROF. MEGHANA
8	BUHK408	Universal human values course	PROF. TARA V K
9	BNSK459/ BPEK459/ BYOK459	National Service Scheme (NSS)/ Physical Education (PE) (Sports and Athletics)/ Yoga	MR. RANGASWAMY

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING  
EVEN 2023-2024 TIME TABLE

SEMESTER: IV CSE 'C' SEC CBCS

2022 SCHEME

CLASS ROOM: C203

W.E.F: 22-04-2024

DAY	1 9:00 - 10:00	2 10:00 - 11:00	TEA	3 11:15 - 12:15	4 12:15 - 1:15	LUNCH 1:15 - 2:00	5 2:00 - 3:00	6 3:00 - 4:00	7 4:00 - 5:00	
MON	BCS403	BCS401	<b>B R E A K</b>	BCS402	BCS405A	<b>L U N C H</b>	LIBRARY			
TUE	<i>LAB (C1- ADA/ C2 - MC / C3 - DBMS)</i>			BCS405A	BUHK408		BBOC407	YOGA/NSS/PE		
WED	BCS402	BCS403		BBOC407	BCS456A		<i>LAB (C2- ADA/ C3 - MC / C1 - DBMS)</i>			
THU	BCS405A	BCS402		BCS401	BCS403		DEPT ACTIVITIES			
FRI	BCS401	BCS405A		<i>LAB (C3 - ADA/ C1 - MC / C2 - DBMS)</i>			PROCTORING			
SAT										

Sl. No	Course Code	Course Name	Faculty Name
1	BCS401	Analysis & Design of Algorithms	PROF. GIRISH G A
2	BCS402	Microcontrollers	DR. NARAYANA SWAMY
3	BCS403	Database Management Systems	PROF. GANGAPPA. D
4	BCSL404	Analysis & Design of Algorithms Lab	PROF. SANGEETA U/SANGEETA RAO
5	BCS405A	Discrete Mathematical Structures	PROF. VANITHA
6	BCS456A	Green IT and Sustainability	PROF. MENAKA C N
7	BBOC407	Biology For Computer Engineers	PROF. MEGHANA
8	BUHK408	Universal human values course	PROF. TARA V K
9	BNSK459/ BPEK459/ BYOK459	National Service Scheme (NSS)/ Physical Education (PE) (Sports and Athletics)/ Yoga	MR. RANGASWAMY

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING  
EVEN 2023-2024 TIME TABLE

SEMESTER: VI CSE 'A' SEC CBCS

2021 SCHEME

CLASS ROOM: C301

W.E.F : 29-04-2024

DAY	1 9:00 - 10:00	2 10:00 - 11:00	TEA	3 11:15 - 12:15	4 12:15 - 1:15	LUNCH 1:15 - 2:00	5 2:00 - 3:00	6 3:00 - 4:00	7 4:00 - 5:00
MON	21CS62	21CS61	<b>B R E A K</b>	21CV654	21CS644	<b>L U N C H</b>	LIBRARY		
TUE	<i>LAB (A1 - FSD/A2 - CG)</i>			21CS63	21CS61		MINIPROJECT		
WED	21CS644	21CS61		<i>LAB (A2 - FSD/A3 - CG)</i>			DEPT. ACTIVITIES		
THU	21CS61	21CV654		21CS63	21CS62		<i>LAB (A3 - FSD/A1 - CG)</i>		
FRI	21CV654	21CS62		21CS644	21CS63		MENTORING		
SAT	INTERNSHIP								

Sl. No	Course Code	Course Name	Faculty Name
1	21CS61	Software Engineering & Project Management	PROF. LAXMI M C
2	21CS62	Fullstack Development	PROF. VIBHAVI R N
3	21CS63	Computer Graphics and Fundamentals of Image Processing	PROF. SWETHA A
4	21CS644	Data Science and Visualization	PROF. AMBIKA P R
5	21CV654	Conservation of Natural resources	PROF. TEJASWINI B N
6	21CSL66	Computer Graphics and Image Processing Laboratory	PROF. SWETHA/ PROF. SHRUTHI B S
7	21CSMP67	Mini Project	PROF. AMBIKA P R
8	21INT68	Internship	PROF. LAXMI M.C / PROF. ARCHANA BHAT



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EVEN 2023-2024 TIME TABLE

SEMESTER: VI CSE 'B' SEC CBCS

2021 SCHEME

CLASS ROOM: C302

W.E.F : 29-04-2024

DAY	1	2	TEA	3	4	LUNCH	5	6	7
	9:00 - 10:00	10:00 - 11:00		11:15 - 12:15	12:15 - 1:15		1:15 - 2:00	2:00 - 3:00	3:00 - 4:00
MON	21CS61	21CS63	B R E A K	LAB (B1 - FSD/B2 - CG)		L U N C H	LIBRARY		
TUE	21CS63	21CS61		21CS62	21CS654		LAB (B2 - FSD/B3 - CG)		
WED	21CS62	21CS644		21CS61	21CS63		DEPT ACTIVITIES		
THU	LAB (B3 - FSD/B1 - CG)			21CS644	21CV654		MINI PROJECT		
FRI	21CS61	21CS644		21CV654	21CS62		MENTORING		
SAT	INTERNSHIP			INTERNSHIP					

Sl. No	Course Code	Course Name	Faculty Name
1	21CS61	Software Engineering & Project Management	PROF HINA NAZNEEN
2	21CS62	Fullstack Development	PROF. VIBHAVI R N
3	21CS63	Computer Graphics and Fundamentals of Image Processing	PROF. SWETHA A
4	21CS644	Data Science and Visualization	PROF. ARCHANA BHAT
5	21CV654	Conservation of Natural resources	PROF. TEJASWINI B N
6	21CSL66	Computer Graphics and Image Processing Laboratory	PROF. MAHADEV PRASAD
7	21CSMP67	Mini Project	PROF. ARCHANA BHAT
8	21INT68	Internship	PROF. KRISHNAVENI / PROF. SANGEETA RAO

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING  
EVEN 2023-2024 TIME TABLE

SEMESTER: VI CSE 'C' SEC CBCS

2021 SCHEME

CLASS ROOM: C303

W.E.F: 29-04-2024

DAY	1 9:00 - 10:00	2 10:00 - 11:00	TEA	3 11:15 - 12:15	4 12:15 - 1:15	LUNCH 1:15 - 2:00	5 2:00 - 3:00	6 3:00 - 4:00	7 4:00 - 5:00
MON	21CS63	21CS62	<b>B R E A K</b>	21CS644	21CS61	<b>L U N C H</b>	LAB (C2 - FSD/ C3 - CG)		
TUE	21CS644	21CS61		21CS63	21CS62		LIBRARY		
WED	LAB (C1 - FSD/ C2 - CG)			21CS654	21CS644		DEPT ACTIVITY		
THU	21CS62	21CS63		21CS61	21CS654		MINI PROJECT		
FRI	21CS61	21CV654		LAB (C3- FSD/ C1- CG)			MENTORING		
SAT	INTERNSHIP			INTERNSHIP					

Sl. No	Course Code	Course Name	Faculty Name
1	21CS61	Software Engineering & Project Management	PROF. LAXMI M C
2	21CS62	Fullstack Development	PROF. SHRAVYA
3	21CS63	Computer Graphics and Fundamentals of Image Processing	PROF. MAHADEV PRASAD
4	21CS644	Data Science and Visualization	PROF. ARCHANA BHAT
5	21CV654	Conservation of Natural resources	PROF. SANGEETA RAO
6	21CSL66	Computer Graphics and Image Processing Laboratory	PROF. MAHADEV PRASAD
7	21CSMP67	Mini Project	PROF. LAXMI M C
8	21INT68	Internship	PROF. ABIKA P. R/ PROF. MENAKA C N

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING  
EVEN 2023-2024 TIME TABLE

SEMESTER: VIII CSE 'A' SEC CBCS


2018 SCHEME


CLASS ROOM: C401

W.E.F : 26-02-2024

DAY	1	2	TEA	3	4	LUNCH	5	6	7
	9:00 – 10:00	10:00 – 11:00	11:00 – 11:15	11:15 – 12:15	12:15 – 1:15	1:15 - 2:00	2:00 – 3:00	3:00 – 4:00	4:00 – 5:00
MON	18CS822	18CS81	<b>B R E A K</b>	18CS822	LIBRARY	<b>L U N C H</b>	MENTOR AND MENTEE INTERACTION		
TUE	18CS81	18CS822		18CS81	LIBRARY		DEPARTMENT ACTIVITY		
WED	18CSP83/18CSI85			18CSP83/18CSI85			LIBRARY		
THU									
FRI									
SAT	18CSS84			18CSS84					

Sl. No	Course Code	Course Name	Faculty Name
1	18CS81	Internet of Things	Prof. Shruthi B S
2	18CS822	Storage Area Networks	Prof. John Peter
3	18CSP83	Project Work Phase - 2	Prof. Swetha. A / Prof. Shruthi B S / Prof. John Peter
4	18CSS84	Technical Seminar	Prof. Vibhavi R N / Prof. Spoorthi M
5	18CS185	Internship	Prof. Girish G A / Prof. Ramesh B

  
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Kanakapura Main Road, BANGALORE - 560 061

**CITY ENGINEERING COLLEGE**  
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING  
EVEN 2023-2024 TIME TABLE

SEMESTER: VIII CSE 'B' SEC CBCS


2018 SCHEME

CLASS ROOM: C402

W.E.F: 26-02-2024

DAY	1	2	TEA	3	4	LUNCH	5	6	7
	9:00 – 10:00	10:00 – 11:00	11:00 – 11:15	11:15 – 12:15	12:15 – 1:15	1:15 - 2:00	2:00 – 3:00	3:00 – 4:00	4:00 – 5:00
MON	18CS81	18CS822	<b>B R E A K</b>	18CS81	LIBRARY	<b>L U N C H</b>	MENTOR AND MENTEE INTERACTION		
TUE	18CS822	18CS81		18CS822	LIBRARY		DEPARTMENT ACTIVITY		
WED	18CSP83/18CSI85			18CSP83/18CSI85			LIBRARY		
THU									
FRI									
SAT	18CSS84			18CSS84					

Sl. No	Course Code	Course Name	Faculty Name
1	18CS81	Internet of Things	Dr. Sowmya Naik P T
2	18CS822	Storage Area Networks	Prof. John Peter
3	18CSP83	Project Work Phase - 2	Prof. Swetha. A / Prof. Shruthi B S / Prof. John Peter
4	18CSS84	Technical Seminar	Prof. Vibhavi R N / Prof. Spoorthi M
5	18CSI85	Internship	Prof. Girish G A / Prof. Ramesh B

  
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# CITY ENGINEERING COLLEGE

Department Of CSE

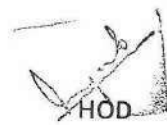
Time Table - April 2024

Faculty Name: Mrs. Shruthi B.S.

Subject: IOT

Sec: VIII CS - A

DAY	9:30 - 10:20	10:20 - 11:10	11:10-11:30	11:30-12:20	12:20-1:10	1:10-2:00	2:00-2:50	2:50-3:40	3:40-4:30	
MON		IOT	Short Break	CG LAB (B2)	Lunch Break		CG LAB (C3)			
TUE	IOT			IOT						
WED	CG LAB (C2)			CG LAB (A3)						
THU								CG LAB (A1)		
FRI						CG LAB (C1)				
SAT										

  
HOD

**INTERNET OF THINGS**  
(Effective from the academic year 2018 -2019)  
**SEMESTER – VIII**

<b>Course Code</b>	<b>18CS81</b>	<b>CIE Marks</b>	<b>40</b>
<b>Number of Contact Hours/Week</b>	<b>3:0:0</b>	<b>SEE Marks</b>	<b>60</b>
<b>Total Number of Contact Hours</b>	<b>40</b>	<b>Exam Hours</b>	<b>03</b>

**CREDITS –3**

**Course Learning Objectives:** This course (18CS81) will enable students to:

- Assess the genesis and impact of IoT applications, architectures in real world.
- Illustrate diverse methods of deploying smart objects and connect them to network.
- Compare different Application protocols for IoT.
- Infer the role of Data Analytics and Security in IoT.
- Identify sensor technologies for sensing real world entities and understand the role of IoT in various domains of Industry.

**Module 1**

What is IoT, Genesis of IoT, IoT and Digitization, IoT Impact, Convergence of IT and IoT, IoT Challenges, IoT Network Architecture and Design, Drivers Behind New Network Architectures, Comparing IoT Architectures, A Simplified IoT Architecture, The Core IoT Functional Stack, IoT Data Management and Compute Stack.

**Textbook 1: Ch.1, 2**

**RBT: L1, L2, L3**

**Contact Hours**

08

**Module 2**

Smart Objects: The “Things” in IoT, Sensors, Actuators, and Smart Objects, Sensor Networks, Connecting Smart Objects, Communications Criteria, IoT Access Technologies.

**Textbook 1: Ch.3, 4**

**RBT: L1, L2, L3**

08

**Module 3**

IP as the IoT Network Layer, The Business Case for IP, The need for Optimization, Optimizing IP for IoT, Profiles and Compliances. Application Protocols for IoT, The Transport Layer, IoT Application Transport Methods.

**Textbook 1: Ch.5, 6**

**RBT: L1, L2, L3**

08

**Module 4**

Data and Analytics for IoT, An Introduction to Data Analytics for IoT, Machine Learning, Big Data Analytics Tools and Technology, Edge Streaming Analytics, Network Analytics, Securing IoT, A Brief History of OT Security, Common Challenges in OT Security, How IT and OT Security Practices and Systems Vary, Formal Risk Analysis Structures: OCTAVE and FAIR, The Phased Application of Security in an Operational Environment

**Textbook 1: Ch.7, 8**

**RBT: L1, L2, L3**

08

**Module 5**

IoT Physical Devices and Endpoints - Arduino UNO: Introduction to Arduino, Arduino UNO, Installing the Software, Fundamentals of Arduino Programming. IoT Physical Devices and Endpoints - RaspberryPi: Introduction to RaspberryPi, About the RaspberryPi Board: Hardware Layout, Operating Systems on RaspberryPi, Configuring RaspberryPi, Programming RaspberryPi with Python, Wireless Temperature Monitoring System Using Pi, DS18B20 Temperature Sensor, Connecting Raspberry Pi via SSH, Accessing Temperature from DS18B20 sensors, Remote access to RaspberryPi, Smart and Connected Cities, An IoT

08

<p>Strategy for Smarter Cities, Smart City IoT Architecture, Smart City Security Architecture, Smart City Use-Case Examples.</p> <p><b>Textbook 1: Ch.12</b></p> <p><b>Textbook 2: Ch.7.1 to 7.4, Ch.8.1 to 8.4, 8.6</b></p> <p><b>RBT: L1, L2, L3</b></p>	
<p><b>Course Outcomes:</b> The student will be able to :</p> <ul style="list-style-type: none"> <li>• Interpret the impact and challenges posed by IoT networks leading to new architectural models.</li> <li>• Compare and contrast the deployment of smart objects and the technologies to connect them to network.</li> <li>• Appraise the role of IoT protocols for efficient network communication.</li> <li>• Elaborate the need for Data Analytics and Security in IoT.</li> <li>• Illustrate different sensor technologies for sensing real world entities and identify the applications of IoT in Industry.</li> </ul>	
<p><b>Question Paper Pattern:</b></p> <ul style="list-style-type: none"> <li>• The question paper will have ten questions.</li> <li>• Each full Question consisting of 20 marks</li> <li>• There will be 2 full questions (with a maximum of four sub questions) from each module.</li> <li>• Each full question will have sub questions covering all the topics under a module.</li> <li>• The students will have to answer 5 full questions, selecting one full question from each module.</li> </ul>	
<p><b>Textbooks:</b></p> <ol style="list-style-type: none"> <li>1. David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Robert Barton, Jerome Henry, "IoT Fundamentals: Networking Technologies, Protocols, and Use Cases for the Internet of Things", 1<sup>st</sup> Edition, Pearson Education (Cisco Press Indian Reprint). (ISBN: 978-9386873743)</li> <li>2. Srinivasa K G, "Internet of Things", CENGAGE Learning India, 2017</li> </ol>	
<p><b>Reference Books:</b></p> <ol style="list-style-type: none"> <li>1. Vijay Madiseti and Arshdeep Bahga, "Internet of Things (A Hands-on-Approach)", 1<sup>st</sup> Edition, VPT. 2014. (ISBN: 978-8173719547)</li> <li>2. Raj Kamal, "Internet of Things: Architecture and Design Principles", 1<sup>st</sup> Edition, McGraw Hill Education, 2017. (ISBN: 978-9352605224)</li> </ol>	
<p><b>Mandatory Note:</b></p> <p>Distribution of CIE Marks is as follows (Total 40 Marks):</p> <ul style="list-style-type: none"> <li>• 20 Marks through IA Tests</li> <li>• 20 Marks through practical assessment</li> </ul> <p><b>Maintain a copy of the report for verification during LIC visit.</b></p>	
<p><b>Possible list of practicals:</b></p> <ol style="list-style-type: none"> <li>1. Transmit a string using UART</li> <li>2. Point-to-Point communication of two Motes over the radio frequency.</li> <li>3. Multi-point to single point communication of Motes over the radio frequency. LAN (Sub-netting).</li> <li>4. I2C protocol study</li> <li>5. Reading Temperature and Relative Humidity value from the sensor</li> </ol>	



## DEPARTMENT OF CSE

### LESSON PLAN FOR EVEN SEMESTER FOR ACADEMIC YEAR 2023-24

Course Title: <b>Internet of Things</b>	Course Code: 18CS81
Total contact hours: 3:0:0	End Term Marks :50
Internal Marks: 50	
Semester: VIII sem A & B section	Academic year: 2023-2024
Lesson plan Author: <b>Dr. Sowmya Naik P T/ Shruthi B S</b>	Date: 07-02-2024

#### Course Learning Objectives:

This course (18CS32) will enable students to:

1. Assess the genesis and impact of IoT applications, architectures in real world.
2. Illustrate diverse methods of deploying smart objects and connect them to network.
3. Compare different Application protocols for IoT.
4. Infer the role of Data Analytics and Security in IoT.
5. Identify sensor technologies for sensing real world entities and understand the role of IoT in various domains of Industry.

#### Course Outcomes:

The student will be able to :

1. Interpret the impact and challenges posed by IoT networks leading to new architectural models.
2. Compare and contrast the deployment of smart objects and the technologies to connect them to network.
3. Appraise the role of IoT protocols for efficient network communication.
4. Elaborate the need for Data Analytics and Security in IoT.
5. Illustrate different sensor technologies for sensing real world entities and identify the applications of IoT in Industry..

#### Module 1

<u>Week</u>	<u>Contents of Module</u>	<u>Bloom's Taxonomy Level</u>	<u>Course Outcome (CO)</u>
1	What is IoT, Genesis of IoT, IoT and Digitization	L1, L2 ,L3	CO-1
	IoT and Digitization, IoT Impact,		
	Convergence of IT and IoT, IoT Challenges		
2	IoT Network Architecture and Design,	L1, L2 ,L3	CO-1
	Drivers Behind New Network Architectures		
	Comparing IoT Architectures		
3	A Simplified IoT Architecture	L1, L2 ,L3	CO-1
	The Core IoT Functional Stack,		
	IoT Data Management and Compute Stack.		

### Module 2

<u>Week</u>	<u>Contents of Module</u>	<u>Bloom's Taxonomy Level</u>	<u>Course Outcome (CO)</u>
4	Smart Objects: The "Things" in IoT,	L1, L2 ,L3	CO-2
	Sensors, Actuators		
	Smart Objects		
5	Sensor Networks, Connecting Smart Objects	L1, L2 ,L3	CO-2
	Communications Criteria		
	IoT Access Technologies.		

### Module 3

<u>Week</u>	<u>Contents of Module</u>	<u>Bloom's Taxonomy Level</u>	<u>Course Outcome (CO)</u>
6	IP as the IoT Network Layer	L1, L2 ,L3	CO-3
	The Business Case for IP		
	The need for Optimization		
7	Optimizing IP for IoT, Profiles and Compliances,	L1, L2 ,L3	CO-3
	Application Protocols for IoT, The Transport Layer		
	IoT Application Transport Methods.		

### Module 4

<u>Week</u>	<u>Contents of Module</u>	<u>Bloom's Taxonomy Level</u>	<u>Course Outcome (CO)</u>
8	Data and Analytics for IoT, An Introduction to Data Analytics for IoT	L1, L2 ,L3	CO-4
	Machine Learning		
	Big Data Analytics Tools and Technology		
9	Edge Streaming Analytics, Network Analytics	L1, L2 ,L3	CO-4
	Securing IoT, A Brief History of OT Security		
	Common Challenges in OT Security		
10	How IT and OT Security Practices and Systems Vary	L1, L2 ,L3	CO-4
	Formal Risk Analysis Structures: OCTAVE and FAIR		
	The Phased Application of Security in an Operational Environment		



### Module 5

<u>Week</u>	<u>Contents of Module</u>	<u>Bloom's Taxonomy Level</u>	<u>Course Outcome (CO)</u>
11	IoT Physical Devices and Endpoints - Arduino UNO: Introduction to Arduino, Arduino UNO, Installing the Software	L1, L2, L3	CO-5
	Fundamentals of Arduino Programming		
	IoT Physical Devices and Endpoints - RaspberryPi: Introduction to RaspberryPi		
12	About the RaspberryPi Board: Hardware Layout, Operating Systems on RaspberryPi	L1, L2, L3	CO-5
	Configuring RaspberryPi, Programming RaspberryPi with Python		
	Wireless Temperature Monitoring System Using Pi, DS18B20 Temperature Sensor		
13	Connecting Raspberry Pi via SSH, Accessing Temperature from DS18B20 sensors, Remote access to RaspberryPi. Smart and Connected Cities	L1, L2, L3	CO-5
	An IoT Strategy for Smarter Cities, Smart City IoT Architecture		
	Smart City Security Architecture, Smart City Use-Case Examples.		

#### RBT Level

L1-Remembering L2-Understanding L3-Applying L4-Analysing L5-Evaluating L6-Creating

#### Textbooks:

- David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Robert Barton, Jerome Henry, "IoT Fundamentals: Networking Technologies, Protocols, and Use Cases for the Internet of Things", 1st Edition, Pearson Education (Cisco Press Indian Reprint). (ISBN: 978-9386873743)
- Srinivasa K G, "Internet of Things", CENGAGE Learning India, 2017

#### Reference Books:

- Vijay Madiseti and Arshdeep Bahga, "Internet of Things (A Hands-on-Approach)", 1st Edition, VPT, 2014. (ISBN: 978-8173719547)
- Raj Kamal, "Internet of Things: Architecture and Design Principles", 1st Edition, McGraw Hill Education, 2017. (ISBN: 978-9352605224)

  
Signature of Faculty

  
Signature of HOD

# CITY ENGINEERING COLLEGE

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING



## Question Bank

COURSE NAME: Internet Of Things Technology

COURSE CODE:18CS81

SEMESTER: 8<sup>th</sup>

SECTION: A,B

### Module 1

1. What is IOT ? Explain evolutionary phases of the Internet
2. Explain Access Network sublayer with a neat diagram.
3. What are the elements of one M2M IOT architecture? Explain
4. Explain the functionality of IOT network management sub layer.
5. Describe IOT World Forum(IOTWF) Standardized architecture.
6. Compare and contrast IT and OT.
7. What is IOT ? Explain in detail on Genesis of IOT.
8. What does IOT and Digitization mean? Elaborate on this concept.
9. Write a short note on " IOT impact in Real World".
10. Discuss IOT challenges.
11. With a neat diagram, explain architecture of IOT.
12. Explain core IOT functional stack.
13. Explain the concept of Intersection Movement Assist(IMA) with graphical representation.
14. Explain IOT Data Management and compute stack.

### Module 2

1. Define Sensors and actuators. Explain how they interact with the physical world.
2. With a neat diagram, explain how actuators and sensors interact with the physical world. Classify actuators based on energy type.
3. Define Sensors and its characteristics.
4. List out the most useful classification scheme for the pragmatic application of sensors in a IoT network.
5. Briefly describe about communication criteria.
6. Define smart objects. Explain its characteristics.
7. What are the main topologies used for IoT connecting devices?
8. List out the limitations of the smart objects in WSN's and explain the data aggregation in WSN with a neat diagram.
9. Explain briefly the Wireless Sensor Networks (WSN).
10. What are Constrained Devices and constrained node networks? Classify them.
11. Explain Zigbee protocol stack using IEEE 802.15.4.
12. Explain Zigbee? Explain 802.15.4 physical layer, MAC layer and security.
13. Explain LoRaWAN standard and alliance MAC layer and security.
14. List and explain different types of sensors.
15. Elaborate on small physical objects and small virtual objects.
16. Explain "IoT Access Technologies".
17. Briefly explain protocol stack utilization IEEE 802.15.4.
18. What is SANET? Explain some advantages and disadvantages that a wireless based solution offers.

HSS

### Module 3

1. Explain in detail the 6LOWPAN.
2. Explain the different schedule management and packet forwarding models of 6TiSCH.
3. Explain the raw socket tunneling of SCADA using different scenarios.
4. What is COAP? Draw COAP message format. Explain its fields.
5. Compare between COAP and MQTT.
6. Explain the working of IP as the IOT network layer.
7. Write note on Business case for IP.
8. Discuss need for optimization.
9. Describe application protocols for IOT.
10. Discuss the various methods used in IOT application transport.
11. List and explain the key advantages of internet protocol.
12. Explain RPL encryption and authentication on constraint nodes.
13. Describe MQTT framework and message format in detail

### Module 4

1. Explain in detail the core function of edge analytics with necessary diagrams.
2. Explain the different components of Flexible Net flow Architecture(FNF).
3. Explain the steps and phases of OCTAVE Allegro methodology.
4. Explain Secured Network Infrastructure by using process control hierarchy model.
5. What do you mean by data and analytics for IOT? Explain.
6. Discuss big data analytics tools and technology.
7. With a case study relate the concept of securing IOT.
8. Explain in detail how IT and OT security practices and systems vary in real time.
9. Discuss OCTAVE and FAIR formal risk analysis
10. Explain the elements of Hadoop with a neat diagram.
11. Explain the neural network in machine learning with a detailed example.
12. Explain Formal Risk Analysis Structures.
13. Explain the pvrdue model for control hierarchy and OT network characteristics

### Module 5

1. Write a note on DS18B20 temperature sensors.
2. With a neat diagram, explain a four layered architecture of a smart city IoT Infrastructure.
3. Explain the following with respect to Arduino programming.
  - i. Structure
  - ii. Function
  - iii. Variables and Data types
  - iv. Digital I/O
4. Briefly explain IoT strategy for smart cities.
5. Explain smart city security architecture , also explain the IoT strategy for Smart Cities.
6. Explain the main parts of Arduino UNO learning board with a neat diagram.
7. Explain the following smart city use cases with example
  - i. Connected street lights
  - ii. Smart Parking with advantage and disadvantage
  - iii. Smart traffic control
  - iv. Connected environment
8. Write short notes on
  - i. Raspberry pi OS
  - ii. Raspberry pi 2 model B and its GPIO

FBS

# CITY ENGINEERING COLLEGE

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING



## Assignment 1

COURSE NAME: INTERNET OF THINGS  
SEMESTER: 8<sup>th</sup>

COURSE CODE:18CS81  
SECTION: A,B

1. What is IOT ? Explain evolutionary phases of the Internet
2. What does IOT and Digitization mean? Elaborate on this concept
3. With a neat diagram, explain architecture of IOT.
4. Explain core IOT functional stack
5. Write a short note on " IOT impact in Real World
6. Discuss IOT challenges
7. Define Sensors and explain its characteristics.
8. With a neat diagram, explain how actuators and sensors interact with the physical world. Classify actuators based on energy type.
9. What is Zigbee? Explain Zigbee protocol stack using IEEE 802.15.4
10. Explain LoRaWAN standard and alliance MAC layer and security

FBS

# CITY ENGINEERING COLLEGE

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING



## Assignment 2

COURSE NAME: INTERNET OF THINGS  
SEMESTER: 8<sup>th</sup>

COURSE CODE: 18CS81  
SECTION: A,B

1. Explain the working of IP as the IOT network layer.
2. Discuss the various methods used in IOT application transport.
3. Explain in detail the 6LOWPAN.
4. Explain the raw socket tunneling of SCADA using different scenarios.
5. Explain COAP and MQTT.
6. List and explain the key advantages of internet protocol
7. Explain in detail the core function of edge analytics with necessary diagrams.
8. Explain the different components of Flexible Net flow Architecture(FNF).
9. Explain in detail how IT and OT security practices and systems vary in real time.
10. What do you mean by data and analytics for IOT? Explain.

A-BS

# CITY ENGINEERING COLLEGE

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING



## Assignment 3

COURSE NAME: INTERNET OF THINGS

COURSE CODE:18CS81

SEMESTER: 8<sup>th</sup>

SECTION: A,B

1. Explain the elements of Hadoop with a neat diagram.
2. Explain the neural network in machine learning with a detailed example
3. With a case study relate the concept of securing IOT.
4. Explain in detail how IT and OT security practices and systems vary in real time.
5. Write a note on DS18B20 temperature sensors.
6. With a neat diagram, explain a four layered architecture of a smart city IoT Infrastructure.
7. Briefly explain IoT strategy for smart cities.
8. Explain smart city security architecture, also explain the IoT strategy for Smart Cities.
9. Write short notes on
  - i Raspberry pi OS
  - ii. Raspberry pi 2 model B and its GPIO
10. Explain the following with respect to Arduino programming.
11. i) Structure ii) Function

ABS

# CITY ENGINEERING COLLEGE

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING



## CLASSROOM ACTIVITY

**COURSE NAME:** Internet of Things

**COURSE CODE:**18CS81

**SEMESTER:** 8<sup>th</sup>

**SECTION:** A,B

1. Hands-On Projects:

- Implemented hands-on projects to allow students to apply theoretical knowledge practically.
- Students were engaged in designing, building, and programming connected devices.
- Practical application of IoT concepts was emphasized through project work.

2. Simulations and Virtual Labs:

- Utilized IoT simulation tools and virtual labs to create a virtual learning environment.
- Provided students with opportunities to experiment with IoT devices and networks virtually.
- Reduced costs and increased accessibility through the use of simulation technology.

3. Industry Partnerships:

- Established partnerships with IoT companies and professionals.
- Guest lectures, workshops, and real-world case studies were organized.
- Students gained insights into industry practices and applications of IoT technology.

4. Problem-Based Learning (PBL):

- Implemented a problem-based learning approach to foster critical thinking.
- Presented students with real-world problems solvable through IoT solutions.
- Emphasized the practical application of IoT knowledge in addressing specific challenges.

ABS

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8/5/2024

COURSE CODE: 18CS81

# CITY ENGINEERING COLLEGE

Kanakapura Road, Doddakallasandra, Bengaluru - 560062

## Computer Science & Engineering

### THIRD INTERNAL

Course Name: INTERNET OF THINGS

Semester : VIII

Duration : 1 ½Hrs

Date: 8/05/2024

Time: 10:30-12:00AM

MAX MARKS: 50

*Note: Answer any FIVE questions choosing at least ONE from each Part.*

		CO'S	BT'S
<i>Part - A</i>			
1.	Explain the elements of Hadoop with a neat diagram.	10	CO4 BT2
<i>Or</i>			
2.	Explain the neural network in machine learning with a detailed example	10	CO4 BT2
<i>Part - B</i>			
3.	With a case study relate the concept of securing IOT.	10	CO4 BT2
<i>Or</i>			
4.	Explain in detail how IT and OT security practices and systems vary in real time.	10	CO4 BT2
<i>Part-C</i>			
5.	Write a note on DS18B20 temperature sensors.	10	CO5 BT2
<i>Or</i>			
6.	With a neat diagram, explain a four layered architecture of a smart city IoT Infrastructure.	10	CO5 BT1,2
<i>Part-D</i>			
7.	Briefly explain IoT strategy for smart cities.	10	CO5 BT1,2
<i>Or</i>			
8.	Explain smart city security architecture, also explain the IoT strategy for Smart Cities.	10	CO5 BT2
<i>Part-E</i>			
9.	Write short notes on i. Raspberry pi OS ii. Raspberry pi 2 model B and its GPIO	10	CO5 BT2
<i>Or</i>			
10.	Explain the following with respect to Arduino programming. i) Structure ii) Function	10	CO5 BT2

**Blooms Taxonomy Levels (BTL):** BT1-Remembering BT2- Understanding BT3-Applying BT4-Analysing

**Course Outcomes (CO's):** After studying this course, students will be able to;

CO4: Infer the role of Data Analytics and Security in IoT.

CO5: Identify sensor technologies for sensing real world entities and understand the role of IoT in various domains of Industry.



# CITY ENGINEERING COLLEGE

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING


## SCHEME FOR EVALUATION

CIE TEST 3

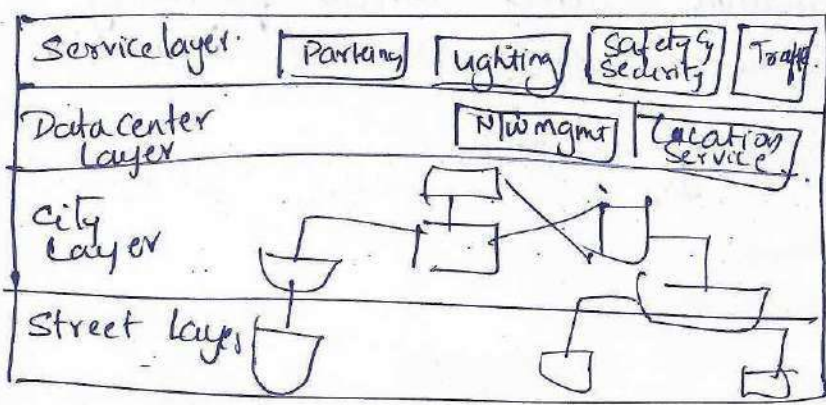
SEMESTER & SECTION: 8th A & B.

DATE: 8/5/24.

Q. No	Details of the Answer	Marks Distribution	Total marks
1.	<p>The two main key elements of hadoop are.</p> <p>1) HDFS</p> <p>a) Name Node b) Data Node</p> <p>2) MapReduce.</p>	5  5	10
2.	<p>Neural n/w's are ML methods that mimic the way the human brain works.</p> <p>Machine Learning &amp; Getting intelligence from BigData</p> <p>i) Local Learning ii) Remote Learning.</p> <p>Examples : a) <del>Monitoring</del> b) Behavioural Control. c) Operations optimization. d) Self healing, Self optimization</p>	5  5	10
3.	<p>IT environments have face active attacks and information security threats for many decades &amp; the incidents are well documented.</p> <p>Cyber security incidents.</p>	5  5	10

Staff Signature: 

  
HOD

Q.No	Details of the Answer	Marks Distribution	Total marks
47	<p>a) Ptude model for control hierarchy</p> <p>level 5 level 4 level 3 level 2 level 1. Safety zone</p> <p>b) OT N/w Characteristics impacting Security</p> <p>a) IT Networks b) OT Networks. c) Security Priorities : Integrity, Availability &amp; Confidentiality. d) Security Focus.</p>	5	10
57	<p>DS18B20 Temperature Sensors</p> <p>→ 1 wire programmable sensors. → Used in hard environments. → range <math>-55^{\circ}\text{C}</math> to <math>+125^{\circ}\text{C}</math> accuracy <math>\pm 1^{\circ}\text{C}</math>.</p> <p>Steps to connect Raspberry Pi via SSH.</p> <ol style="list-style-type: none"> <li>1. Set up local N/w &amp; wireless connectivity.</li> <li>2. Enable SSH.</li> <li>3. Enable SSH on headless Raspberry Pi.</li> <li>4. Set up your client.</li> </ol> <p>Accessing temperature from DS18B20 sensor.</p>	3	10
6)	 <p>Explanation of each layer</p>	3	10

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

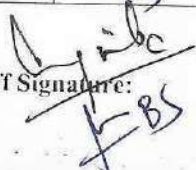
## SCHEME FOR EVALUATION

CIE TEST 3

SEMESTER & SECTION: 8th A & B

DATE: 8/5/24

Q. No	Details of the Answer	Marks Distribution	Total marks
7)	<p>i) Vertical IoT Needs for smart city.</p> <p>ii) Global vs Siloed Strategies.</p> <p>IoT expects to have the following economic impact over 10-year period.</p> <ol style="list-style-type: none"> <li>1) Smart building</li> <li>2) Gas Monitoring</li> <li>3) Smart Parking</li> <li>4) Water management</li> <li>5) Road Pricing</li> </ol>	<p>5</p> <p>5</p>	10
8)	<p>A serious concern for smart city and their citizens is data security.</p> <ul style="list-style-type: none"> <li>→ vast quantities of</li> <li>→ security protocol should be used for authentication</li> <li>→ street level sensors.</li> </ul> <p>Common elements for security on n/w layers</p> <ul style="list-style-type: none"> <li>Firewall</li> <li>VLAN</li> <li>Encryption</li> </ul> <p>Strategies.</p> <ol style="list-style-type: none"> <li>1) Vertical IoT needs for smart city.</li> <li>2) Global vs Siloed Strategies</li> </ol>	<p>5</p> <p>5</p>	10

Staff Signature: 

HOD: 

Q.No	Details of the Answer	Marks Distribution	Total marks
97	<p>Raspherey pi OS.</p> <ul style="list-style-type: none"> <li>→ Installed through SD Card.</li> <li>→ Micro SD slot used.</li> <li>→ 3rd party OS → MA Ubuntu MATE, Ubuntu core, windows 10 core.</li> <li>RISC OS.</li> <li>→ steps involved in installation</li> </ul> <p>ii) Raspberry pi 2 model B &amp; its GPIO</p> <p>Diagram</p> <p>Processor. Power source. SD card. GPIO. DSE Display &amp; Arduino Jack.</p>	<p>10</p> <p>2</p> <p>3</p>	<p>10</p>
10	<p>Arduino Programming</p> <ul style="list-style-type: none"> <li>17 Structure</li> <li>27 Function</li> </ul>	<p>5</p> <p>5</p>	<p>10</p>

Year : 2023 - 2024

Semester : Odd / Even ✓

Name of the Teacher : Shruthi B.S

Designation : Asst. Prof.

Department : CSE

Sem/Branch	Subject Code	Subject
1. <u>8<sup>th</sup> CSE (A sec)</u>	<u>18CS81</u>	<u>Internet of Things</u>
2. ....	.....	.....
3. ....	.....	.....

	Initials at the End of the			
	1st Month	2nd Month	3rd Month	Semester
Staff	<u>FBS</u>	<u>FBS</u>	<u>FBS</u>	<u>FBS</u>
HOD	<u>[Signature]</u>	<u>[Signature]</u>	<u>[Signature]</u>	<u>[Signature]</u>
Principal	<u>[Signature]</u>	<u>[Signature]</u>	<u>[Signature]</u>	<u>[Signature]</u>

### ATTENDANCE

Sl. No.	Reg. No.	Name	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	ICE20CS001	Abhay	1	2	3	4	5	6	7	8	9	10									
2	ICE20CS002	Abhinav Kumar Singh	0	1	2	3	4	5	6	7	8	9									
3	ICE20CS003	Abhishek Vats	1	2	3	4	5	6	7	8	9	10									
4	ICE20CS004	Adarsh Mishra S	0	1	2	3	4	5	6	7	8	9	10								
5	ICE20CS005	Aditi B	0	0	1	2	3	4	5	6	7	8	9								
6	ICE20CS006	Afran Ahmed	0	1	2	3	4	5	6	7	8	9	10								
7	ICE20CS007	Arshvasya	1	2	3	4	5	6	7	8	9	10	11								
8	ICE20CS008	Ajay Anupam	0	1	2	3	4	5	6	7	8	9	9								
9	ICE20CS009	Amita Anjum	1	2	3	4	5	6	7	8	9	10	11								
10	ICE20CS010	Arnulya V R	0	1	2	3	4	5	6	7	8	9	10								
11	ICE20CS011	Anand M	0	1	2	3	4	5	6	7	8	9									
12	ICE20CS012	Aranya B C	1	2	3	4	5	6	7	8	9	10	11								
13	ICE20CS013	Aranya Bhagavan	1	2	3	4	5	6	7	8	9	10									
14	ICE20CS014	Anuradha Sharma	0	1	2	3	4	5	6	7	8	9	9								
15	ICE20CS015	Aravind V	1	2	3	4	5	6	7	8	9	10									
16	ICE20CS017	Ashra	1	2	3	4	5	6	7	8	9	10	11								
17	ICE20CS018	B Dhanalakshmi Bai	0	1	2	3	4	5	6	7	8	9	10								
18	ICE20CS019	Bonita Hathiyal X	1	2	3	4	5	6	7	8	9	10	11								
19	ICE20CS021	Bhargavi N Prakash	0	1	2	3	4	5	6	7	8	9	10								
20	ICE20CS024	Daniya Khanum	1	2	3	4	5	6	7	8	9	10	11								
21	ICE20CS025	Deeksha R Gauda	1	2	3	4	5	6	7	8	9	10	10								
22	ICE20CS026	Deepak Kumar R	1	2	3	4	5	6	7	8	9	10	11								
23	ICE20CS027	Deepashree N	0	1	2	3	4	5	6	7	8	9	10								
24	ICE20CS028	Deepthi S	1	2	3	4	5	6	7	8	9	10	11								
25	ICE20CS029	Dhanush Kumar D	0	0	1	2	3	4	5	6	7	8	9								
No. of Absents																					
Initials																					

### ASSESSMENT

Sl. No.	Reg. No.	Name	Test Marks					Sessional Marks	Remarks
			1	2	3	4	5		
1	ICE20CS001	Abhay	16	14	12	10		32	
2	ICE20CS002	Abhinav Kumar Singh	30	30	30	10		40	
3	ICE20CS003	Abhishek Vats	30	30	30	10		40	
4	ICE20CS004	Adarsh Mishra S	26	27	30	10		40	
5	ICE20CS005	Aditi B	30	24	30	20		39	
6	ICE20CS006	Afran Ahmed	22	25	15	10		36	
7	ICE20CS007	Arshvasya	30	30	30	10		40	
8	ICE20CS008	Ajay Anupam	12	24	30	10		36	
9	ICE20CS009	Amita Anjum	AB	28	15	10		32	
10	ICE20CS010	Arnulya V R	30	30	30	10		40	
11	ICE20CS011	Anand M	22	24	27	10		37	
12	ICE20CS012	Aranya B C	30	30	30	10		40	
13	ICE20CS013	Aranya Bhagavan	30	30	30	10		40	
14	ICE20CS014	Anuradha Sharma	30	27	30	16		40	
15	ICE20CS015	Aravind V	30	30	30	10		40	
16	ICE20CS017	Ashra	30	30	30	10		40	
17	ICE20CS018	B Dhanalakshmi Bai	30	30	30	10		40	
18	ICE20CS019	Bonita Hathiyal X	30	30	30	10		40	
19	ICE20CS021	Bhargavi N Prakash	30	30	30	10		40	
20	ICE20CS024	Daniya Khanum	26	30	30	10		40	
21	ICE20CS025	Deeksha R Gauda	30	30	30	10		40	
22	ICE20CS026	Deepak Kumar R	29	30	30	10		40	
23	ICE20CS027	Deepashree N	16	30	30	10		38	
24	ICE20CS028	Deepthi S	30	30	30	10		40	
25	ICE20CS029	Dhanush Kumar D	16	25	26	10		36	

### ATTENDANCE

Sl. No.	Reg. No.	Name	Days											
			22	23	24	25	26	27	28	29	30	31		
1	ICE20CS001	Abhay	22	23	24	25	26	27	28	29	30	31		
2	ICE20CS002	Abhinav Kumar Singh	22	23	24	25	26	27	28	29	30	31		
3	ICE20CS003	Abhishek Vats	22	23	24	25	26	27	28	29	30	31		
4	ICE20CS004	Adarsh Mishra S	22	23	24	25	26	27	28	29	30	31		
5	ICE20CS005	Aditi B	22	23	24	25	26	27	28	29	30	31		
6	ICE20CS006	Ahnan Ahmed	22	23	24	25	26	27	28	29	30	31		
7	ICE20CS007	Aishwarya	22	23	24	25	26	27	28	29	30	31		
8	ICE20CS008	Ajay Anupam	22	23	24	25	26	27	28	29	30	31		
9	ICE20CS009	Amir Anjum	22	23	24	25	26	27	28	29	30	31		
10	ICE20CS010	Amulya V R	22	23	24	25	26	27	28	29	30	31		
11	ICE20CS011	Anand M	22	23	24	25	26	27	28	29	30	31		
12	ICE20CS012	Ananya B C	22	23	24	25	26	27	28	29	30	31		
13	ICE20CS013	Ananya Bhagavan	22	23	24	25	26	27	28	29	30	31		
14	ICE20CS014	Anusadha Shatma	22	23	24	25	26	27	28	29	30	31		
15	ICE20CS015	Aravind V	22	23	24	25	26	27	28	29	30	31		
16	ICE20CS017	Asha	22	23	24	25	26	27	28	29	30	31		
17	ICE20CS018	B Dhanalakshmi Bai	22	23	24	25	26	27	28	29	30	31		
18	ICE20CS019	Banitta Hathsiyal X	22	23	24	25	26	27	28	29	30	31		
19	ICE20CS021	Bhargavi N Prakash	22	23	24	25	26	27	28	29	30	31		
20	ICE20CS024	Daniya Khanum	22	23	24	25	26	27	28	29	30	31		
21	ICE20CS025	Deeksha R Gauda	22	23	24	25	26	27	28	29	30	31		
22	ICE20CS026	Deepak Kumar R	22	23	24	25	26	27	28	29	30	31		
23	ICE20CS027	Deepashree N	22	23	24	25	26	27	28	29	30	31		
24	ICE20CS028	Deepthi S	22	23	24	25	26	27	28	29	30	31		
25	ICE20CS029	Dhanush Kumar D	22	23	24	25	26	27	28	29	30	31		
No. of Absents														
Initials														

### ASSESSMENT

Sl. No.	Reg. No.	Name	Test Marks					Sessional Marks	Remarks
			1	2	3	4	5		
			1	ICE20CS001	Abhay	16	14		
2	ICE20CS002	Abhinav Kumar Singh	30	30	30	10	40		
3	ICE20CS003	Abhishek Vats	30	30	30	10	40		
4	ICE20CS004	Adarsh Mishra S	26	27	30	10	40		
5	ICE20CS005	Aditi B	30	24	30	10	39		
6	ICE20CS006	Ahnan Ahmed	22	25	15	10	36		
7	ICE20CS007	Aishwarya	30	30	30	10	40		
8	ICE20CS008	Ajay Anupam	12	24	30	10	36		
9	ICE20CS009	Amir Anjum	AB	25	15	10	32		
10	ICE20CS010	Amulya V R	30	30	30	10	40		
11	ICE20CS011	Anand M	22	24	27	10	37		
12	ICE20CS012	Ananya B C	30	30	30	10	40		
13	ICE20CS013	Ananya Bhagavan	30	30	30	10	40		
14	ICE20CS014	Anusadha Shatma	30	27	30	10	40		
15	ICE20CS015	Aravind V	30	30	30	10	40		
16	ICE20CS017	Asha	30	30	30	10	40		
17	ICE20CS018	B Dhanalakshmi Bai	30	30	30	10	40		
18	ICE20CS019	Banitta Hathsiyal X	30	30	30	10	40		
19	ICE20CS021	Bhargavi N Prakash	26	30	30	10	40		
20	ICE20CS024	Daniya Khanum	30	30	30	10	40		
21	ICE20CS025	Deeksha R Gauda	30	30	30	10	40		
22	ICE20CS026	Deepak Kumar R	29	30	30	10	40		
23	ICE20CS027	Deepashree N	16	30	30	10	38		
24	ICE20CS028	Deepthi S	30	30	30	10	40		
25	ICE20CS029	Dhanush Kumar D	16	25	26	10	36		
No. of Absents									
Initials									

### ATTENDANCE

Sl. No.	Reg. No.	Name											
			1	2	3	4	5	6	7	8	9	10	11
26	ICE20CS030	Dinyastee S	0	1	2	3	4	5	6	7	8	9	10
27	ICE20CS031	DR Motan Kumar	1	2	3	4	5	6	7	8	9	10	11
28	ICE20CS033	Ganesh	0	0	1	2	3	4	5	6	7	8	9
29	ICE20CS034	Bhishma Narayana Hegde	0	1	2	3	4	5	6	7	8	9	10
30	ICE20CS035	Gowtham S V	1	2	3	4	5	6	7	8	9	10	11
31	ICE20CS036	Haleema Sultan	0	1	2	3	4	5	6	7	8	9	10
32	ICE20CS037	Ipam Balikh	1	2	3	4	5	6	7	8	9	10	11
33	ICE20CS038	Judah A	1	2	3	4	5	6	7	8	9	10	11
34	ICE20CS040	K G Dhanya Jiji	0	0	1	2	3	4	5	6	7	8	9
35	ICE20CS039	Jyothi JR Sahani	1	2	3	4	5	6	7	8	9	10	11
36	ICE20CS047	M R Adhithi	0	1	2	3	4	5	6	7	8	9	10
37	ICE20CS062	Ravi Kumar	1	2	3	4	5	6	7	8	9	10	11
38	ICE20CS069	Shaha S	1	2	3	4	5	6	7	8	9	10	11
39	ICE20CS071	Spoorthi M G	0	1	2	3	4	5	6	7	8	9	10
40	ICE20CS079	Tarun V	1	2	3	4	5	6	7	8	9	10	11
41	ICE20CS081	Tejas J Kumar	1	2	3	4	5	6	7	8	9	10	11
42	ICE20CS085	Venugopal D	0	1	2	3	4	5	6	7	8	9	10
43													
44													
45													
46													
47													
48													
49													
50													
No. of Absents													
Initials													

### ASSESSMENT

Attn.	Test Marks					Sessional Marks	Remarks
	1	2	3	4	5		
	30	30	30	10		40	Dinyastee S
	22	18	30	10		37	
	12	24	21	10		35	Ganesh v. jithu
	28	30	30	10		40	
	24	30	30	10		39	
	30	24	24	10		38	Haleema
	30	30	30	10		40	
	19	16	24	10		35	
	16	24	24	10		36	
	27	30	30	10		40	
	26	30	30	10		40	
	11	AB	27	10		32	
	30	30	30	10		40	
	11	6	26	10		32	
	24	30	30	10		40	
	25	23	30	10		38	
	25	24	30	10		38	



### ATTENDANCE

Sl. No.	Reg. No.	Name	22	23	24	25	26	27	28	29	30	31
26	ICE20CS030	Dhnyastree S	21	22	23	24	25	26	27	28	29	30
27	ICE20CS031	DR Mohan Kumar	22	23	24	25	26	27	28	29	30	31
28	ICE20CS033	Ganesh	20	21	22	23	24	25	26	27	28	29
29	ICE20CS034	Bhijja Nanayana Hegde	20	21	22	23	24	25	26	27	28	29
30	ICE20CS035	Browham S V	20	21	22	23	24	25	26	27	28	29
31	ICE20CS036	Haleema Sultan	21	22	23	24	25	26	27	28	29	30
32	ICE20CS037	Pranav Shalkh	21	22	23	24	25	26	27	28	29	30
33	ICE20CS038	Judah A	21	22	23	24	25	26	27	28	29	30
34	ICE20CS040	K G Dhanya Jogi	30	20	21	22	23	24	25	26	27	28
35	ICE20CS039	Jyothi JR Sahani	22	23	24	25	26	27	28	29	30	31
36	ICE20CS047	M R Adithi	21	22	23	24	25	26	27	28	29	30
37	ICE20CS062	Ravi Kumar	21	22	23	24	25	26	27	28	29	30
38	ICE20CS069	Shrha S	22	23	24	25	26	27	28	29	30	31
39	ICE20CS071	Sparsh M G	21	22	23	24	25	26	27	28	29	30
40	ICE20CS079	Tarun V	21	22	23	24	25	26	27	28	29	30
41	ICE20CS081	Tejas J Kumar	21	22	23	24	25	26	27	28	29	30
42	ICE20CS085	Venuopal D	21	22	23	24	25	26	27	28	29	30
43												
44												
45												
46												
47												
48												
49												
50												
	No. of Absents											
	Initials											

### ASSESSMENT

Attn.	Test Marks					Sessional Marks	Remarks
	1	2	3	4	5		
31	20	20	30	10		40	Dhnyastree S
32	22	18	30	10		37	
30	12	24	21	10		35	Ganesh v. jhree
30	28	30	30	10		40	
32	24	30	30	10		39	
31	30	24	24	10		38	Haleema
31	30	30	30	10		40	
30	19	16	24	10		35	
29	16	24	24	10		36	
32	27	30	30	10		40	
31	26	30	30	10		40	
31	11	AB	27	10		32	
32	30	30	30	10		40	
31	11	6	26	10		32	
30	29	30	30	10		40	
30	25	23	30	10		38	
30	25	24	30	10		38	

**CITY ENGINEERING COLLEGE**  
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**  
**LESSON PLAN 2023-2024**

**SUBJECT: INTERNET OF THINGS**

**FACULTY NAME: Prof. Shruthi B S**  
**SEM: 8<sup>th</sup>**

**SUBJECT CODE:18CS81**  
**SEC: A,B**

Week	Date		Topics Planned
	From	To	
I	12/2/2024	18/2/2024	<b>Module 1</b> What is IoT, Genesis of IoT, IoT and Digitization, IoT Impact, Convergence of IT and IoT, IoT Challenges
II	19/2/2024	25/2/2024	IoT Network Architecture and Design, Drivers Behind New Network Architectures, Comparing IoT Architectures
III	27/2/2024	2/3/2024	A Simplified IoT Architecture, The Core IoT Functional Stack, IoT Data Management and Compute Stack.
IV	5/3/2024	9/3/2024	<b>Module 2</b> Smart Objects: The "Things" in IoT, Sensors, Actuators, and Smart Objects,
V	12/3/2024	16/3/2024	Sensor Networks, Connecting Smart Objects, Communications Criteria, IoT Access Technologies.
VI	18/3/2024	23/3/2024	<b>Module 3</b> IP as the IoT Network Layer, The Business Case for IP, The need for Optimization
VII	25/3/2024	30/3/2024	Optimizing IP for IoT, Profiles and Compliances, Application Protocols for IoT, The Transport Layer, IoT Application Transport Methods.
VIII	1/4/2024	6/4/2024	<b>Module 4</b> Data and Analytics for IoT, An Introduction to Data Analytics for IoT, Machine Learning, Big Data Analytics Tools and Technology
IX	8/4/2024	13/4/2024	Edge Streaming Analytics, Network Analytics, Securing IoT, A Brief History of OT Security, Common Challenges in OT Security,


**CITY ENGINEERING COLLEGE**  
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**  
**LESSON PLAN 2023- 2024**

**SUBJECT: INTERNET OF THINGS**

**FACULTY NAME: Prof. Shruthi B S**  
**SEM: 8<sup>th</sup>**

**SUBJECT CODE:18CS81**  
**SEC: A,B**

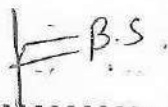
Week	Date		Topics Planned
	From	To	
X	15/4/2024	20/4/2024	How IT and OT Security Practices and Systems Vary, Formal Risk Analysis Structures: OCTAVE and FAIR, The Phased Application of Security in an Operational Environment
XI	22/4/2024	27/4/2024	<b>Module 5</b> IoT Physical Devices and Endpoints - Arduino UNO: Introduction to Arduino, Arduino UNO, Installing the Software, Fundamentals of Arduino Programming, IoT Physical Devices and Endpoints - RaspberryPi: Introduction to RaspberryPi,
XII	29/4/2024	4/5/2023	About the RaspberryPi Board: Hardware Layout, Operating Systems on RaspberryPi, Configuring RaspberryPi, Programming RaspberryPi with Python, Wireless Temperature Monitoring System Using Pi, DS18B20 Temperature Sensor
XIII	6/5/2023	11/5/2023	Connecting Raspberry Pi via SSH, Accessing Temperature from DS18B20 sensors, Remote access to RaspberryPi, Smart and Connected Cities, An IoT Strategy for Smarter Cities, Smart City IoT Architecture, Smart City Security Architecture, Smart City Use-Case Examples.

  
Teacher Signature

  
HOD Signature

## RECORD OF CLASS WORK

Date	Period	Topics Covered
12/2/24	2	<del>Module 1</del> What is IOT? Genesis of IOT
14/2/24	2	IOT and digitalization.
19/2/24	2	IOT Impact
20/2/24	1	Convergence of IOT
21/2/24	2	Drivers behind IOT architecture
26/2/24	1	Comparing two architectures
	2	Comparing two architectures, Simplified <sup>architect</sup>
27/2/24	1	Functional stack & computational stack
	3	<del>Module 2</del> Smart objects: The Things, Sensors actuators & smart objects
4/3/24	2	Sensor N/w, Connecting smart objects, Communication
5/3/24		Criteria
5/3/24	1	IOT Access Technologies, <sup>M3</sup> IP as IOT N/w layer
	3	Business Cases for IP, Need for optimization.
11/3/24	2	Optimization IP for IOT, Profiles & compliance
11/3/24	4	Appln protocols for IOT, Transport layer, IOT Appln transport method
12/3/24	1	M4 Data and Analytics for IOT, Data ML
	3	Big Data Analytics tools & Technologies.
18/3/24	2	Edge streaming Analytics, N/w Analytics
	4	Securing IOT, History of OT Security



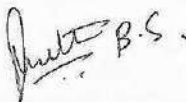
.....  
Teacher's Signature




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HOD'S Signature

## RECORD OF CLASS WORK

Date	Period	Topics Covered
19/3/24	1	Challenges for OT Security, Formal Risk Analysis
	3	OCTAVE & FAIR
25/3/24	2	The phased Application of security in operational environments
	4	MS Arduino UNO, Installing SW,
11/4/24	2	Fundamentals of Arduino Programming
	4	Raspberry Pi - HW layout, OS on Raspberry Pi.
2/4/24	1	Configuring, Programming with Raspberry Pi,
	3	Raspberry Pi with Python.
8/4/24	2	Wireless Temperature Monitoring S/m using Pi
15/4/24	2	DS18B20 - Temperature sensor.
16/4/24	1	Connecting RPi via SSH, Accessing temp from DS18B20
	3	Smart & connected cities.
2/5/24	1	An IoT Strategy for smart city
6/5/24	2	Smart City IoT architecture.
	4	Smart City IoT architecture
7/5/24	1	} Use Case Examples - Smart city
	3	

.....  
  
 Teacher's Signature

.....  
  
 HOD'S Signature



# CITY ENGINEERING COLLEGE

Approved by AICTE New Delhi & Affiliated by VTU, Belagavi  
Doddakallasandra, Off Kanakapura Main Road,  
Next to Gokulam Apartment, Bangalore - 560 062.



## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

### CIRCULAR

Ref. No: CEC/CSE/DAC/ACY 2023-2024/01

Date: 22-08-2023

This is to inform the members of Department Advisory Committee that meeting is scheduled on 01-09-2023 at 11: 00 AM in CSE department at Lab C107.

#### Agenda:

- Conduct an orientation for 3<sup>rd</sup> semester students
- Planning of Internships for 5<sup>th</sup> semester students
- Involving students in technical activities
- Societal Projects for PG students.
- Conducting workshop/seminar/guest lectures

**Dr. Sowmya Naik P T**

**HOD**



# CITY ENGINEERING COLLEGE

Approved by AICTE New Delhi & Affiliated by VTU, Belagavi  
Doddakallasandra, Off Kanakapura Main Road,  
Next to Gokulam Apartment, Bangalore - 560 062.



## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

### Department Advisory Committee Meeting

Date: 01/09/2023

Time: 11:00 AM

Venue: Room No. C107

DAC Members Present:

Sl. No	Member Name	Designation	Role	Sign
1	Dr. Sowmya Naik P T	HOD	Convenor	
2	Dr. Y S Kumaraswamy	Professor	Member	
3	Mrs. Ambika P R	Assistant Professor	Co-Convenor	
4	Mrs. Laxmi M C	Assistant Professor	Member	
5	Mr. Girish G A	Assistant Professor	Member	
6	Mrs. Archana Bhat	Assistant Professor	Member	
7	Mrs. Sangeeta Uranakar	Assistant Professor	Member	
8	Mrs. Swetha A	Assistant Professor	Member	
9	Mrs. Shruthi B S	Assistant Professor	Member	
10	Mr. Narasimha Prasad K L	Project Manager, Accenture Services Pvt. Ltd	Alumni (Industry Expert)	
11	Ms. Deepika R	SAP functional consultant, Exikon Technology Private Limited	Alumni	

The Department Advisory Committee meeting was conducted at Department of CSE, on 1<sup>st</sup> September, 2023, at 11 AM.

#### Agenda of the Meeting:

- Conduct an orientation for 3<sup>rd</sup> semester students
- Planning of Internships for 5<sup>th</sup> semester students
- Involving students in technical activities
- Societal Projects for PG students.
- Conducting workshop/seminar/guest lectures.



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Next to Gokulam Apartment, Bangalore - 560 062.



## Minutes of Meeting:

During the Department Advisory Committee meeting, an overview of the department was provided, showcasing student achievement, and faculty accomplishments and contributions. The members discussed suggestions for improvement and reviewed the meeting agenda.

The following points were discussed in the meeting:

- Committee members suggested establishing MOUs with various IT industries to provide students with internship opportunities.
- It was proposed to conduct a technical symposium with increased student participation.
- The committee decided to organize guest lecture, industry visit, and workshop for students in the 3rd, 5th, and 7th semesters.
- It was discussed to conduct an orientation for third-semester students to raise awareness about the 22-Scheme curriculum, particularly regarding registration for NSS, Yoga, or Physical Education.
- The HOD emphasized the importance of societal projects and the need to find opportunities for such initiatives.

**Dr. Sowmya Naik P T**

**HOD & Convenor**





# ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ

(ವಿ ಟಿ ಯು ಅಧಿಸಿಯಮ 1994 ರ ಅಡಿಯಲ್ಲಿ ಕರ್ನಾಟಕ ಸರ್ಕಾರದಿಂದ ಸ್ಥಾಪಿತವಾದ ರಾಜ್ಯ ವಿಶ್ವವಿದ್ಯಾಲಯ)

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY**

(State University of Government of Karnataka Established as per the VTU Act, 1994)

Phone : 0831-2498100 / 2405468

Fax : 0831-2405467

Email : registrar@vtu.ac.in

Web : https://vtu.ac.in

Reference: VTU/BGM/AC14/2023-24/5761

Dated: 18 JAN 2024

## Revised-NOTIFICATION

**Subject:** Tentative Academic Calendar of 3rd semester of B.E./B. Tech. programs, regarding...

**Reference:** Hon'ble Vice-Chancellor's approval dated: 16.01.2024

The tentative academic calendar concerned to 3rd semester of B.E./B.Tech. programs, for academic year 2023-24 are hereby notified(revised) as mentioned below;

	III Semester B.E. / B. Tech. (2022 scheme)	III Semester B.E. / B. Tech. (2022 scheme)
Commencement of the Semester	15.11.2023	15.11.2023
Commencement of Classes	15.11.2023	15.11.2023
Last Working day of the Semester	20.02.2024	02.03.2024 (for lateral Entry Students only)
Practical Examination (Regular Students)	21.02.2024 To 29.02.2024	-----
Theory Examinations	04.03.2024 To 23.03.2024	04.03.2024 To 23.03.2024
Practical Examinations (For Lateral Entry Students)	----	25.03.2024 To 30.03.2024
Commencement of NEXT Semester	01.04.2024	01.04.2024

### Please Note:

- If required, the college can plan to have extra classes on 1<sup>st</sup> and 3<sup>rd</sup> Saturday and Sundays to complete academic activities within the academic duration mentioned. For lateral entry students academic activities should be conducted up to 02.03.2024.
- The faculty/staff shall be available to undertake any work assigned by the university.

R

- Notification regarding the Calendar of Events relating to the conduct of University **Examinations** will be issued by the Registrar (Evaluation) from time to time.
- Academic Calendar **may be modified** based on guidelines/directions issued in the future by UGC/AICTE/State Government.
- Autonomous Colleges must adhere to the Academic Calendar as well. Any modifications to the academic terms and examination schedule that Autonomous Colleges choose to make can only be made with the University's agreement.
- If any suggestions/clarification please email to **-sbhalbhavi@vtu.ac.in**

The Principals of Non-Autonomous, Constituent, and Autonomous Engineering Colleges and chairpersons of the University departments are hereby informed to bring the academic calendar to the notice of all concerned.

Sd/-

REGISTRAR

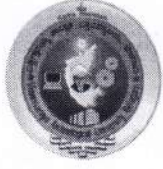
To,

1. The Principals of all Non-autonomous/ constituent /Autonomous Engineering Colleges under the ambit of VTU Belagavi.
2. The chairperson, of the Department of Mechanical Engineering /Civil Engineering /Computer Science and Engineering& Communication Electronics Engineering of the University.

Copy to.

1. To the Hon'ble Vice-Chancellor through the secretary to VC, VTU Belagavi for information
2. The Registrar (Evaluation), VTU Belagavi for information and needful.
3. The Regional Directors (I/c) of all the regional offices of VTU for circulation.
4. The Director ITI SMU, VTU Belagavi for information and to make arrangements to upload the Academic Calendar on the VTU web portal.
5. The Director of Physical Education, VTU Belagavi for information
6. The Director, Central Placement Cell, VTU Belagavi for information
7. The Special Officer Library, VTU Belagavi for information
8. All the concerned Special Officer/s and Caseworker/s of the academic section, VTU, Belagavi

Ra 17/01/24 BE  
REGISTRAR  
F.



# ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ

("ವಿ ಟಿ ಯು ಅಧಿನಿಯಮ ೧೯೯೪" ರ ಅಡಿಯಲ್ಲಿ ಕರ್ನಾಟಕ ಸರ್ಕಾರದಿಂದ ಸ್ಥಾಪಿತವಾದ ರಾಜ್ಯ ವಿಶ್ವವಿದ್ಯಾಲಯ)

## VISVESVARAYA TECHNOLOGICAL UNIVERSITY

(State University of Government of Karnataka Established as per the VTU Act, 1994)

"JnanaSangama" Belagavi-590018, Karnataka, India

**Prof. Dr. B. E. Rangaswamy, Ph.D.**  
REGISTRAR

**Phone: (0831) 2498100**  
**Fax : (0831) 2405467**

REF: VTU/BGM/ACA/2023-24/ 3252

DATE: 30 SEP 2023

### NOTIFICATION

- Subject:** Tentative Academic Calendar of 1st semester of B.Sc(Hons) program, 3<sup>rd</sup> and 5<sup>th</sup> semesters B.E./B.Tech. programs, 4<sup>th</sup> semester of MBA(IEV) program regarding...
- Reference:** Hon'ble Vice-Chancellor's approval dated: 30.09.2023

The tentative academic calendar concerned to 1st semester of B.Sc.(Hons) program, 3<sup>rd</sup> and 5<sup>th</sup> semesters B.E./B.Tech. programs, 4<sup>th</sup> semester of MBA(IEV) program for academic year 2023-24 are hereby notified as mentioned below;

	III semester B.E./B.Tech. (2022 scheme)	V semester B.E./ B.Tech. (2021 scheme)	I sem B.Sc(Hons)	IV semester MBA(IEV)*
Commencement of the Semester	25.10.2023	25.10.2023	03.10.2023	09.10.2023
Internship	----	25.10.2023 To 23.11.2023	---	----
Commencement of Classes	25.10.2023	25.11.2023	03.10.2023	09.10.2023
Last Working day of the Semester	10.02.2024	09.03.2024	25.01.2024	27.01.2024
Practical Examination/ Internship Viva Voce/ Project viva	12.02.2024 To 22.02.2024	11.03.2024 To 20.03.2024	29.01.2024 To 09.02.2024	01.02.2024 To 08.02.2024
Theory Examinations	26.02.2024 To 15.03.2024	22.03.2024 To 20.04.2024	12.02.2024 To 01.03.2024	
Commencement of NEXT Semester	18.03.2024	22.04.2024	04.03.2024	-----

\*Students have to complete skill certification and Internship within this duration (09.10.2023 to 27.01.2024)

**Please Note:**

- The academic sessions for semesters should commence on the **date mentioned** above.
- If required, the college can plan to have extra classes on 1<sup>st</sup> and 3<sup>rd</sup> Saturday and Sundays to complete academic activities within the academic duration mentioned.
- The faculty/staff shall be available to undertake any work assigned by the university.
- Notification regarding the Calendar of Events relating to the conduct of University **Examinations** will be issued by the Registrar (Evaluation) from time to time.
- Academic Calendar **may be modified** based on guidelines/directions issued in the future by UGC/AICTE/State Government.
- Academic Calendar is also applicable for **Autonomous Colleges**. If any changes are to be effected by Autonomous Colleges in the academic terms and examination schedule, they could do so with the approval of the University.
- If any suggestions/clarification/correction, please email to **-sbhvtuso@yahoo.com**

The Principals of Affiliated, Constituent and Autonomous Engineering Colleges, Chairpersons of the University departments are hereby informed to bring the academic calendar to the notice of all concerned.

Sd/-  
REGISTRAR

**To,**

1. The Principals of all affiliated/ constituent /Autonomous Engineering Colleges under the ambit of VTU Belagavi.
2. The chairperson, of the Department of Mechanical Engineering /Civil Engineering /Computer Science and Engineering& Communication Electronics Engineering of the University.

**Copy to.**

1. To the Hon'ble Vice-Chancellor through the secretary to VC, VTU Belagavi for information
2. The Registrar (Evaluation), VTU Belagavi for information.
3. The Regional Directors (I/c) of all the regional offices of VTU for circulation.
4. The Director ITI SMU, VTU Belagavi for information and to make arrangements to upload Academic Calendar on the VTU web portal.
5. The Director of Physical Education, VTU Belagavi for information
6. The Director, Central Placement Cell, VTU Belagavi for information
7. The Special Officer Library, VTU Belagavi for information
8. All the concerned Special Officer/s and Caseworker/s of the academic section, VTU, Belagavi

Rax  
30/09/13 BE  
REGISTRAR  
[Signature]



# ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ

("ವಿ ಜಿ ಯು ಅಧಿನಿಯಮ ೧೯೯೪" ರ ಅಡಿಯಲ್ಲಿ ಕರ್ನಾಟಕ ಸರ್ಕಾರದಿಂದ ಸ್ಥಾಪಿತವಾದ ರಾಜ್ಯ ವಿಶ್ವವಿದ್ಯಾಲಯ)

## VISVESVARAYA TECHNOLOGICAL UNIVERSITY

(State University of Government of Karnataka Established as per the VTU Act, 1994)

"JnanaSangama" Belagavi-590018, Karnataka, India

Prof. Dr. B. E. Rangaswamy, Ph.D.  
REGISTRAR

Phone: (0831) 2498100  
Fax : (0831) 2405467

REF: VTU/BGM/ACA/2023-24/ 3342

DATE: 5 OCT 2023

### Revised-NOTIFICATION

- Subject:** Tentative Academic Calendar of 1st semesters of B.E./B.Tech./B.Arch./B.Plan., and VII semester of B.E./B.Tech., programs of University regarding...
- Reference:** Dean faculty of Engineering, VTU Belagavi approval dated 24.08.2023  
Hon'ble Vice-Chancellor's approval dated: 24.08.2023

The tentative academic calendar concerned to 1st semesters of B.E./B.Tech./B.Arch./B.Plan., and VII semester of B.E./B.Tech., programs of University for academic year 2023-24 are hereby notified as mentioned below;

	I semester B.E./B.Tech (2022 scheme)	I semester B.Plan/B.Arch (2021 scheme)	VII semester B.E./B.Tech (2018 scheme)
Commencement of the Semester	04.09.2023	04.09.2023	14.08.2023
# Internship/Students Induction Program	04.09.2023 To 14.09.2023	04.09.2023 To 14.09.2023	14.08.2023 To 09.09.2023
Commencement of Classes	15.09.2023	15.09.2023	11.09.2023
Last Working day of the Semester	06.01.2024	06.01.2024	06.01.2024
Practical Examination	08.01.2024 To 19.01.2024	08.01.2024 To 19.01.2024	08.01.2024 To 19.01.2024
Theory Examinations	22.01.2024 To 17.02.2024	22.01.2024 To 17.02.2024	22.01.2024 To 09.02.2024
Commencement of NEXT Semester	19.02.2024	19.02.2024	13.02.2024

# Internship for VI semester completed students and Students Induction Program for 1<sup>st</sup> semester Students

#### Please Note:

- The academic sessions for ODD semesters should commence on the **date mentioned** above.

**\*\* Induction Program** shall be conducted for 11 days at the beginning of 1<sup>st</sup> semester and 10 days at the beginning of the 2<sup>nd</sup> semester. During the induction program, college has to brief about the new curriculum that implemented from the academic year 2022-23.

- If required, the college can plan to have extra classes on 1<sup>st</sup> and 3<sup>rd</sup> Saturday and Sundays to complete academic activities within the duration mentioned.
- The faculty/staff shall be available to undertake any work assigned by the university.
- Notification regarding the Calendar of Events relating to the conduct of University **Examinations** will be issued by the Registrar (Evaluation) from time to time.
- Academic Calendar **may be modified** based on guidelines/directions issued in the future by UGC/AICTE/State Government.
- Academic Calendar is also applicable for **Autonomous Colleges**. If any changes are to be effected by Autonomous Colleges in the academic terms and examination schedule, they could do so with the approval of the University.
- The circular related to AICTE Activity point will be issued by the Registrar's office separately.
- If any suggestions/clarification/correction, please email to -[sbhvtuso@yahoo.com](mailto:sbhvtuso@yahoo.com)

The Principals of Affiliated, Constituent and Autonomous Engineering Colleges, Chairpersons of the University departments are hereby informed to bring the academic calendar to the notice of all concerned.

Sd/-

REGISTRAR

To,

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4. The Director I/c. ITI SMU, VTU Belagavi for information and to make arrangements to upload Academic Calendar on the VTU web portal.
5. The Director of Physical Education, VTU Belagavi for information
6. The Director, Central Placement Cell, VTU Belagavi for information
7. The Special Officer Library, VTU Belagavi for information
8. OS for information and make arrangements to send the circular regarding AICTE Activity Points
9. All the concerned Special Officer/s and Caseworker/s of the academic section, VTU, Belagavi

Rav 05/10/23 BE

REGISTRAR

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## CITY ENGINEERING COLLEGE ACADEMIC CALENDAR 2023-24 Odd SEM

OCT 2023		NOV 2023		DEC 2023		JAN 2024		FEB 2024		March 2024		April 2024			
DAY	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	
SUN	1														
MON	2	GANDHI JAYANTHI					1	II test for 1st sem , III test for VII sem, I st test V sem, & III sem					1	Start of 4th sem	
TUE	3						2							2	
WED	4		1	RAJYOTSAVA DAY			3							3	
THU	5		2				4		1				4		
FRI	6		3		1		5		2		1		5		
SAT	7	1st Saturday holiday	4	1st Saturday holiday	2	Alumni Meet 1st Saturday holiday	6	Last Working day I & 7	3	1st Saturday holiday	2	1st Saturday holiday	6	1st Saturday holiday	
SUN	8		5		3		7		4		3		7		
MON	9		6	1st test I sem and VII sem	4	II nd test VII sem,	8	Practical Exam I, 7	5	2nd test 3 <sup>rd</sup> sem V sem,	4	III test for V sem, Start of theory 3 <sup>rd</sup>	8		
TUE	10		7		5		9		6		5		9	Ugadhi, Ramzan	
WED	11		8		6		10		7		6		10		
THU	12		9		7		11		8		7		11		
FRI	13		10		8		12		9		8		12	Maha Shivarathri	
SAT	14	MAHALAYA AMAVASA	11	9	13	10	9	13	Last working day- 5th						
SUN	15		12	10	14		14		11		10		14		
MON	16		13	11	15		15	Sankranthi	12		11	Start of practical 5th	15		
TUE	17		14	BALIPADYAMI	12		16		13	Start of 8th sem	12		16		
WED	18		15	Start of 3rd sem	13		17		14		13		17		
THU	19		16		14		18		15		14		18		
FRI	20		17		15		19		16		15		19		
SAT	21	3rd Saturday holiday	18	Graduation Day 3rd Saturday holiday	16	3rd Saturday holiday	20	3rd Saturday holiday	17	3rd Saturday holiday	16	3rd Saturday holiday	20	3rd Saturday holiday	
SUN	22		19		17		21		18		17		21		
MON	23	AYUDHA POOJA	20		18		22	THEORY EXAM 1 & 7	19	Start of 2 <sup>nd</sup> sem	18		22	Start of 6th sem	
TUE	24	VIJAYA DASHAMI	21		19		23		20	Last working day- 3rd	19		23		
WED	25	Start of 5th sem INTERNSHIP	22		20		24		21	Start of practical 3rd	20		24		
THU	26		23		21		25		22		21		25		
FRI	27		24		22		26	Republic day	23		22	Start of theory 5th	26		
SAT	28	VALMIKI JAYANTHI	25	Start of 5th sem class	23		27		24		23		27		
SUN	29		26		24		28		25		24		28		
MON	30		27		25	CHRISTMAS	29		26		25	Holi	29		
TUE	31		28		26		30		27		26		30		
WED			29		27		31		28		27				
THU			30	KANAKADASA JAYANTHI	28				29		28				
FRI					29						29	Good Friday			
SAT					30						30				
SUN					31						31				



## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING ACADEMIC CALENDAR 2023-24 Odd SEM

OCT 2023		NOV 2023		DEC 2023		JAN 2024		FEB 2024		March 2024		April 2024			
DAY	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	
SUN	1														
MON	2	GANDHI JAYANTHI					1	II test for 1st sem , III test for VII sem, I st test V sem, & III sem					1	Start of 4th sem	
TUE	3						2							2	
WED	4		1	RAJYOTSAVA DAY			3							3	
THU	5		2				4		1				4		
FRI	6		3		1		5		2		1		5		
SAT	7	1st Saturday holiday	4	1st Saturday holiday	2	Alumni Meet 1st Saturday holiday	6	Last Working day I & 7	3	1st Saturday holiday	2	1st Saturday holiday	6	1st Saturday holiday	
SUN	8		5		3		7		4		3		7		
MON	9		6	Ist test I sem and VII sem	4	II nd test VII sem, ATAL FDP – Basic (4 <sup>th</sup> – 9 <sup>th</sup> Dec)	8	Practical Exam I, 7	5	2nd test 3 <sup>rd</sup> sem V sem,	4	III test for V sem, Start of theory 3 <sup>rd</sup>	8		
TUE	10		7		5		9		6		5		9	Ugadhi, Ramzan	
WED	11		8		6		10		7		6		10		
THU	12		9		7		11		8		7		11		
FRI	13		10		8		12	Workshop for III Sem	9				8	Maha Shivarathri	
SAT	14	MAHALAYA AMAVASA	11		9		13		10		9	Last working day- 5th	13		
SUN	15		12		10		14		11		10		14		
MON	16		13		11	ATAL FDP Advanced (11 <sup>th</sup> – 16 <sup>th</sup> Dec)	15	Sankranthi	12		11	Start of practical 5th	15		
TUE	17		14	BALIPADYAMI	12		16		13	Start of 8th sem	12		16		
WED	18		15	Start of 3rd sem	13		17		14		13		17		
THU	19		16		14		18		15		14		18		
FRI	20		17		15		19		16	Guest Lecture	15		19		
SAT	21	3rd Saturday holiday	18	Graduation Day 3rd Saturday holiday	16	3rd Saturday holiday	20	3rd Saturday holiday	17	3rd Saturday holiday	16	3rd Saturday holiday	20	3rd Saturday holiday	
SUN	22		19		17		21		18		17		21		
MON	23	AYUDHA POOJA	20		18		22	THEORY EXAM 1 & 7	19	Start of 2 <sup>nd</sup> sem	18		22	Start of 6th sem	
TUE	24	VIJAYA DASHAMI	21		19		23		20	Last working day- 3rd	19		23		
WED	25	Start of 5th sem INTERNSHIP	22		20		24		21	Start of practical 3rd	20		24		
THU	26		23		21		25	Industrial Visit – V sem	22		21		25		
FRI	27		24		22	Alumni Interaction	26	Republic day	23		22	Start of theory 5th	26		
SAT	28	VALMIKI JAYANTHI	25	Start of 5th sem class	23		27		24		23		27		
SUN	29		26		24		28		25		24		28		
MON	30		27		25	CHRISTMAS	29		26		25	Holi	29		
TUE	31		28		26		30		27		26		30		
WED			29		27		31		28		27				
THU			30	KANAKADASA JAYANTHI	28				29		28				
FRI					29	Tech Symposium					29	Good Friday			
SAT					30						30				
SUN					31						31				





# CITY ENGINEERING COLLEGE

Approved by AICTE New Delhi & Affiliated by VTU, Belagavi  
Doddakallasandra, Off Kanakapura Main Road,  
Next to Gokulam Apartment, Bangalore - 560 062.



ACADEMIC YEAR: 2023-24 (odd)

## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING COURSE PREFERENCE

Name of the Faculty: Dr. Sowmya Naik

Designation: Professor & Head

Sl. No	Course Code and Name	Year/Semester
1.	18CS34 - User Interface Design	4 <sup>th</sup> / 7 <sup>th</sup>
2.	18CS71 - AI & ML	4 <sup>th</sup> / 7 <sup>th</sup>

Signature of Faculty



# CITY ENGINEERING COLLEGE

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Next to Gokulam Apartment, Bangalore - 560 062.



ACADEMIC YEAR: 2023-24  
odd

## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

### COURSE PREFERENCE

Name of the Faculty: B. Ramiah  
Designation: Asst. Professor

Sl. No	Course Code and Name	Year/Semester
1.	Data Analysis with Excel	2/3rd
2.	operable systems BC8358A	2/3rd
3.	Automata Theory BC8-03 21051	3/5 <sup>th</sup>

Signature of Faculty



# CITY ENGINEERING COLLEGE

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Doddakallasandra, Off Kanakapura Main Road,  
Next to Gokulam Apartment, Bangalore - 560 062.



ACADEMIC YEAR: 2023-24(Odd)

## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

### COURSE ALLOCATION

Sl.No	Name of the Faculty	Course Code and Name	Year/ Semester	Signature
1	Dr. Sowmya Naik P. T.	18CS34-User Interface Design	4 <sup>th</sup> /7 <sup>th</sup>	
2	Dr. Y. S. Kumaraswamy	18CS742- Network Management	4 <sup>th</sup> /7 <sup>th</sup>	
3	Mrs. Ambika P. R.	21CS54-Artificial Intelligence & Machine Learning	5 <sup>th</sup> /3 <sup>rd</sup>	
4	Mrs. Archana Bhat	18CS53- Database Management System 18CSL55- DBMS lab with Mini Project	5 <sup>th</sup> /3 <sup>rd</sup>	
5	Mr. G. A. Girish	18CS72 - Big Data Analytics 18CSL55- DBMS lab with Mini Project	4 <sup>th</sup> /7 <sup>th</sup> 3 <sup>rd</sup> /5 <sup>th</sup>	
6	Mrs. Laxmi M. C.	21CS51- Automata Theory and Compiler Design	5 <sup>th</sup> /3 <sup>rd</sup>	
7	Mr. Gangappa B Demannavar	BCS306A- Object Oriented Programming with Java 18CSP77-Project Phase-1	4 <sup>th</sup> /7 <sup>th</sup>	
8	Mrs. Tejaswini B N	BCS304- Data Structure & Applications BCSL305- Data Structure Lab	2 <sup>nd</sup> /3 <sup>rd</sup>	
9	Mrs. Sangeeta S Uranakar	BCS303-Operating Systems	2 <sup>nd</sup> /3 <sup>rd</sup>	
10	Mr. B. Ramesh	BCS358A- Data Analytics wit Excel	2 <sup>nd</sup> /3 <sup>rd</sup>	
11	Mrs. Shruthi B.S.	BPLCK105B- Introduction to Python Programming	1 <sup>st</sup> / 1 <sup>st</sup>	





# CITY ENGINEERING COLLEGE

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12	Mrs. Sangeetha Rao S	21CSL581- Angular JS & Node JS	3 <sup>rd</sup> /5 <sup>th</sup>	
13	Mrs. Shwetha A	18CS71-Artificial Intelligence and Machine Learning 18CSL76- AI&ML Lab 18CSP77-Project Phase 1	4 <sup>th</sup> /7 <sup>th</sup>	
14	Mrs. Tara V K	18RMI56-Research Methodology and Intellectual Property Rights	3 <sup>rd</sup> /5 <sup>th</sup>	
15	Mr.Mahadev Prasad	BCS304- Data Structure & Applications BCSL305- Data Structure Lab	2 <sup>nd</sup> /3 <sup>rd</sup>	
16	Ms. Shruthi Vijay	BCS306A-Object Oriented Programming with Java	2 <sup>nd</sup> /3 <sup>rd</sup>	
17	Mrs. Hina Nazneen	BCS303-Operating Systems	2 <sup>nd</sup> /3 <sup>rd</sup>	
18	Mrs. Vibhavi R N	BETCK105H- Introduction to IoT	1 <sup>st</sup> /1 <sup>st</sup>	
19	Shravya S	18CS34-User Interface Design 18CSL55- DBMS lab with Mini Project	4 <sup>th</sup> /7 <sup>th</sup> 3 <sup>rd</sup> /5 <sup>th</sup>	
20	Menaka C N	21CS52-Computer Networks	3 <sup>rd</sup> /5 <sup>th</sup>	
20	Krishnaveni K	21CS52-Computer Networks	3 <sup>rd</sup> /5 <sup>th</sup>	
22	Varalakshmi P	21CSL581- Angular JS & Node JS	3 <sup>rd</sup> /5 <sup>th</sup>	
23	Mrs. Spoorthi	BPOPS203- Principles of Programming Using C	1 <sup>st</sup> /1 <sup>st</sup>	

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Dept of Computer Science & Engineering  
CITY ENGINEERING COLLEGE  
Doddakallasandra, Off Kanakapura Road  
Bangalore 560031



W.E.F 15<sup>th</sup> NOV. 2023



# CITY ENGINEERING COLLEGE

## Department Of CSE

September 2023

Time Table for III Sem 'A' Section

Room No: C201

DAY	9:00 -10:00	10:00 - 11:00	11:00 11:15	11:15- 12:15	12:15 -1:15	1:15 - 2:00	2:00 - 3:00	3:00 - 4:00	4:00 -5:00	
MON	DDCO	OOPS	Short Break	DS	MAT	Lunch Break	OS - A2/ DS - A3/ DDCO - A1			
TUE	DS	MAT		DDCO - A2/ OS - A3/ DS - A1			OOPS	DDCO	PE	
WED	MAT	OS		OOPS - A1/ DAE - A2			Department Activities			
THU	OOPS - A2/ DAE - A3			OS	MAT		OOPS - A3/ DAE - A1			
FRI	MAT	DDCO		DDCO - A3/ OS - A1/ DS - A2			DS	OS		
SAT	PE			SCR						

Sl. No	Course Code	Course Name	Course	Faculty Name
1	BCS301	Mathematics for Computer Science	MAT	Ms. Bhavitha
2	BCS302	Digital Design & Computer Organization	DDCO	Mrs. Anita Patil
3	BCS303	Operating Systems	OS	Mrs. Hina Nazneen
4	BCS304	Data Structures and Applications	DSA	Mrs. Tejaswini
5	BCSL305	Data Structures Lab	DS LAB	Mrs. Tejaswini/ Mr. Mahadeva Prasad
6	BCS306A	Object Oriented Programming with Java	OOP	Ms. Shruthi V
7	BSCK307	Social Connect and Responsibility	SCR	Ms. Meghana
8	BCS358A	Data Analytics with Excel	DAE	Mr. Ramesh B / Mrs. Nayana
9	BPEK359	National Service Scheme / Physical Education/ Yoga	PE	Mr. Rangaswamy

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(Archana Bhat)  
TT coordinator

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W.E.F 15<sup>th</sup> NOV 2023



# CITY ENGINEERING COLLEGE

## Department Of CSE

September 2023

Time Table for III Sem 'B' Section

Room No: C202

DAY	9:00 -10:00	10:00 - 11:00	11:00 11:15	11:15- 12:15	12:15 -1:15	1:15 - 2:00	2:00 - 3:00	3:00 - 4:00	4:00 -5:00
MON	OS	OOPS	Short Break	MAT	DDCO	Lunch Break	OOPS - B1/ DAE - B2		
TUE	MAT	DDCO		OOPS - B2/ DAE - B3			SCR		
WED	MAT	OS		DDCO-B1/ OS -B2/ DS -B3			DS	DDCO	PE
THU	DDCO - B2/ OS - B3/ DS - B1			DS	MAT		DDCO - B3/ OS - B1/ DS - B2		
FRI	DS	MAT		OOPS - B3/ DAE - B1			OS	OOPS	
SAT	PE			Department Activities					

Sl . No	Course Code	Course Name	Course	Faculty Name
1	BCS301	Mathematics for Computer Science	MAT	Ms. Janavi
2	BCS302	Digital Design & Computer Organization	DDCO	Mrs. Anita Patil
3	BCS303	Operating Systems	OS	Mrs. Sangeetha U
4	BCS304	Data Structures and Applications	DSA	Mr. Mahadeva Prasad
5	BCSL305	Data Structures Lab	DS LAB	Mr. Mahadeva Prasad/ Mrs. Sangeetha Rao
6	BCS306A	Object Oriented Programming with Java	OOP	Mr. Gangappa D
7	BSCK307	Social Connect and Responsibility	SCR	Ms. Meghana
8	BCS358A	Data Analytics with Excel	DAE	Mr. Ramesh B / Mrs. Nayana
9	BPEK359	Physical Education	PE	Mr. Rangaswamy

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W.E.F 15<sup>th</sup> NOV 2023



**CITY ENGINEERING COLLEGE**  
**Department Of CSE**  
**September 2023**  
**Time Table for III Sem 'C' Section** **Room No: C203**

DAY	9:00 -10:00	10:00 - 11:00	11:00 11:15	11:15- 12:15	12:15 -1:15	1:15 - 2:00	2:00 - 3:00	3:00 - 4:00	4:00 -5:00		
MON	DDCO - C1/ OS - C2/ DS-C3		Short Break	OS	OOPS	Lunch Break	MAT	DS			
TUE	OS - C1/ OOPS - C3			OS	MAT		DS - C1/DDCO - C2/ OS - C3				
WED	OOPS - C1/ DAE-C2			MAT	DDCO		SCR				
THU	MAT	DS		DDCO - C3/ DS-C2/ DAE-C1			DDCO	OS	PE		
FRI	DS	OOPS		DDCO	MAT		OOPS-C2/ DAE-C3				
SAT	PE			Department Activities							


Sl . No	Course Code	Course Name	Course	Faculty Name
1	BCS301	Mathematics for Computer Science	MAT	Mrs. Rekha R
2	BCS302	Digital Design & Computer Organization	DDCO	Mrs. Vani
3	BCS303	Operating Systems	OS	Mrs. Sangeetha U
4	BCS304	Data Structures and Applications	DSA	Mrs. Tejaswini B N
5	BCSL305	Data Structures Lab	DS LAB	Mrs. Tejaswini B N/ Mr. Mahadeva Prasad
6	BCS306A	Object Oriented Programming with Java	OOP	Mrs. Shruthi V
7	BSCK307	Social Connect and Responsibility	SCR	Ms. Meghana
8	BCS358A	Data Analytics with Excel	DAE	Mr. Ramesh B / Mrs. Nayana
9	BPEK359	Physical Education	PE	Mr. Rangaswamy

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W.E.F 25<sup>th</sup> NOV 2023

 <b>CITY ENGINEERING COLLEGE</b> Department Of CSE September 2023 Time Table for V Sem 'A' Section										Room No: C301	
DAY	9:00 -10:00	10:00 - 11:00	11:00 11:15	11:15- 12:15	12:15 -1:15	1:15 - 2:00	2:00 - 3:00	3:00 - 4:00	4:00 -5:00		
MON	CN -A1/ DBMS -A2/ AJ-A3		Short Break	AIML	DBMS	Lunch Break	Physical Education				
TUE	AIML	DBS		CN	ATCD		CN - A3/ DBMS - A1/ AJ -A2				
WED	RMI	ATCD		AJ	CN		INTERNSHIP/DET.ACTIVITY/ ICT				
THU	CN	RMI		DBMS	AIML		INTERNSHIP/DET.ACTIVITY/ ICT				
FRI	ATCD	ES		CN - A2/ DBMS - A3/ AJ -A1			DBMS MINI PROJECT				
SAT	DBMS MINI PROJECT			DBMS MINI PROJECT							

Sl. No	Course Code	Course Name	Course	Faculty Name
1	21CS51	AUTOMATA THEORY AND COMPILER DESIGN	ATCD	Mrs. Laxmi M C
2	21CS52	COMPUTER NETWORKS	CN	Mrs. Krishnaveni K
3	21CS53	DATABASE MANAGEMENT SYSTEMS	DBMS	Mrs. Archana Bhat
4	21CS54	ARTIFICIAL INTELLIGENCE & MACHINE LEARNING	AIML	Mrs. Ambika P R
5	21CSL55	DATABASE MANAGEMENT LAB WITH MINI PROJECT	DBMS LAB	Ms. Shravya / Mrs. Archana Bhat
6	21RMI56	RESEARCH METHODOLOGY AND INTELLECTUAL PROPERTY RIGHTS	RMI	Mrs. Tara V K
7	21CIV57	ENVIRONMENTAL STUDIES	ES	Ms. Meghana
8	21CSL581	ANGULAR JS AND NODE JS	AJ	Mrs. Sangeetha Rao/ Mrs. Varalakshmi P

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W.E.F 25<sup>th</sup> Nov 2023



# CITY ENGINEERING COLLEGE

## Department Of CSE

September 2023

Time Table for V Sem 'B' Section

Room No: C302

DAY	9:00 -10:00	10:00 - 11:00	11:00 11:15	11:15- 12:15	12:15 -1:15	1:15 - 2:00	2:00 - 3:00	3:00 - 4:00	4:00 -5:00
MON	AIML	DBMS	Short Break	CN	RMI	Lunch Break	INTERNSHIP/DET.ACTIVITY/ ICT		
TUE	RMI	ATCD		CN - B1/ DBMS - B2/ AJ -B3			Physical Education		
WED	CN -B2/ DBMS -B3/ AJ -B1			ES	ATCD		INTERNSHIP/DET.ACTIVITY/ ICT		
THU	DBMS	AIML		ATCD	CN		CN - B3/ DBMS - B1/ AJ -B2		
FRI	CN	AJNJ		DBMS	AIML		DBMS MINI PROJECT		
SAT	DBMS MINI PROJECT			DBMS MINI PROJECT					

Sl. No	Course Code	Course Name	Course	Faculty Name
1	21CS51	AUTOMATA THEORY AND COMPILER DESIGN	ATCD	Mrs. Laxmi M C
2	21CS52	COMPUTER NETWORKS	CN	Mrs. Krishnaveni K
3	21CS53	DATABASE MANAGEMENT SYSTEMS	DBMS	Mrs. Archana Bhat
4	21CS54	ARTIFICIAL INTELLIGENCE & MACHINE LEARNING	AIML	Mrs. Ambika P R
5	21CSL55	DATABASE MANAGEMENT LAB WITH MINI PROJECT	DBMS LAB	Ms. Shravya / Mr. Girish G A
6	21RMI56	RESEARCH METHODOLOGY AND INTELLECTUAL PROPERTY RIGHTS	RMI	Mrs. Tara V K
7	21CIV57	ENVIRONMENTAL STUDIES	ES	Ms. Meghana
8	21CSL581	ANGULAR JS AND NODE JS	AJ	Mrs. Sangeetha Rao/ Mrs. Varalakshmi P

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W.E.F 25<sup>th</sup> NOV 2023

# CITY ENGINEERING COLLEGE

## Department Of CSE

September 2023

Time Table for V Sem 'C' Section

Room No: C303

DAY	9:00 -10:00	10:00 - 11:00	11:00 11:15	11:15- 12:15	12:15 -1:15	1:15 - 2:00	2:00 - 3:00	3:00 - 4:00	4:00 -5:00
MON	AJNJ	RMI	Short Break	CN	ATCD	Lunch Break	INTERNSHIP/DET.ACTIVITY/ ICT		
TUE	CN -C1/ DBMS - C2/ AJ -C3			AIML	DBMS		INTERNSHIP/DET.ACTIVITY/ ICT		
WED	CN	DBMS		AIML	RMI		CN - C2/ DBMS - C3/ AJ -C1		
THU	ATCD	CN		CN - C3/ DBMS - C1/ AJ -C2			Physical Education		
FRI	DBMS	AIML		ATCD	ES		DBMS MINI PROJECT		
SAT	DBMS MINI PROJECT			DBMS MINI PROJECT					

Sl . No	Course Code	Course Name	Course	Faculty Name
1	21CS51	AUTOMATA THEORY AND COMPILER DESIGN	ATCD	Mrs. Laxmi M C
2	21CS52	COMPUTER NETWORKS	CN	Ms. Menaka C N
3	21CS53	DATABASE MANAGEMENT SYSTEMS	DBMS	Mrs. Archana Bhat
4	21CS54	ARTIFICIAL INTELLIGENCE & MACHINE LEARNING	AIML	Mrs. Ambika P R
5	21CSL55	DATABASE MANAGEMENT LAB WITH MINI PROJECT	DBMS LAB	Ms. Shravya / Mrs. Archana Bhat
6	21RMI56	RESEARCH METHODOLOGY AND INTELLECTUAL PROPERTY RIGHTS	RMI	Mrs. Tara V K
7	21CIV57	ENVIRONMENTAL STUDIES	ES	Ms. Meghana
8	21CSL581	ANGULAR JS AND NODE JS	AJ	Mrs. Sangeetha Rao/ Mrs. Varalakshmi P

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# CITY ENGINEERING COLLEGE

## Department Of CSE

September 2023


Time Table for VII Sem 'A' Section

Room No: C407

DAY	9:00 -10:00	10:00 - 11:00	11:00 11:15	11:15- 12:15	12:15 -1:15	1:15 -2:00	2:00 - 3:00	3:00 - 4:00	4:00 -5:00		
MON	BDA	NMS	Short Break	AIML	UID	Lunch Break	AIML LAB (A1 Batch)				
TUE	NMS	AIML		UID	E&E		BDA	Project Work			
WED	UID	NMS		BDA	AIML		AIML LAB (A2 Batch)				
THU	AIML	BDA		E&E	E&E		Project Work				
FRI	Internship			Internship			Placement Activities				
SAT											

Sl. No	Course Code	Course Name	Course	Faculty Name
1	18CS71	Artificial Intelligence and Machine Learning	AI&ML	Mrs. Swetha. A
2	18CS72	Big Data Analytics	BDA	Mr. Girish G A
3	18CS734	User Interface Design	UID	Dr. Sowmya Naik P T
4	18CS742	Network Management	NM	Dr. Y S Kumaraswamy
5	18ME751	Energy and Environment (Open Elective)	E&E	Mr. Harshavardhan
6	18CSL76	Artificial Intelligence and Machine Learning Laboratory	AI&ML LAB	Mrs. Swetha A
7	18CSP77	Project Work Phase I	Project	Mrs. Swetha A/ Mr. Gangappa

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W.E.F 11-09-2023



# CITY ENGINEERING COLLEGE

## Department Of CSE

September 2023

Time Table for VII Sem 'B' Section

Room No: C408

DAY	9:00 -10:00	10:00 - 11:00	11:00 11:15	11:15- 12:15	12:15 -1:15	1:15 - 2:00	2:00 - 3:00	3:00 - 4:00	4:00 -5:00	
MON	AIML	E&E	Short Break	BDA	NMS	Lunch Break	UID	Project Work		
TUE	UID	BDA		NMS	AIML		AIML LAB (B1 Batch)			
WED	BDA	AIML		E&E	E&E		Internship			
THU	NMS	UID		AIML	BDA		AIML LAB (B2 Batch)			
FRI	Internship			Internship			Placement Activities			
SAT										

Sl. No	Course Code	Course Name	Course	Faculty Name
1	18CS71	Artificial Intelligence and Machine Learning	AI&ML	Mrs. Swetha. A
2	18CS72	Big Data Analytics	BDA	Mr. Girish G A
3	18CS734	User Interface Design	UID	Ms. Shrivya
4	18CS742	Network Management	NM	Dr. Y S Kumaraswamy
5	18ME751	Energy and Environment (Open Elective)	E&E	Mr. Harshavardhan
6	18CSL76	Artificial Intelligence and Machine Learning Laboratory	AI&ML LAB	Mrs. Swetha A
7	18CSP77	Project Work Phase I	Project	Mrs. Swetha A/ Mr. Gangappa

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TT coordinator

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# CITY ENGINEERING COLLEGE

Department Of CSE

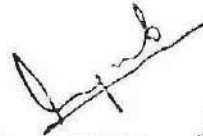
Time Table - September 2023

Faculty Name: Mrs. Archana Bhat

Subject: Database Management Systems(21CS53)

Sec: V CS - A, B, C

DAY	9:00 -10:00	10:00 - 11:00	11:00 11:15	11:15- 12:15	12:15 -1:15	1:15 -2:00	2:00 - 3:00	3:00 - 4:00	4:00 -5:00	
MON	DBMS LAB (A2)	V - B	Short Break		V - A	Lunch Break				
TUE		V - A			V - C			DBMS LAB (A1)		
WED		V - C								
THU	V - B				V - A					
FRI	V - C				V - B		DBMS LAB (A3)			
SAT										

  
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<b>DATABASE MANAGEMENT SYSTEMS</b>			
Course Code	21CS53	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	3:0:0:0	SEE Marks	50
Total Hours of Pedagogy	40	Total Marks	100
Credits	03	Exam Hours	03
<b>Course Learning Objectives</b>			

- CLO 1. Provide a strong foundation in database concepts, technology, and practice.  
 CLO 2. Practice SQL programming through a variety of database problems.  
 CLO 3. Demonstrate the use of concurrency and transactions in database  
 CLO 4. Design and build database applications for real world problems.

#### **Teaching-Learning Process (General Instructions)**

These are sample Strategies, which teachers can use to accelerate the attainment of the various course outcomes.

1. Lecturer method (L) need not to be only a traditional lecture method, but alternative effective teaching methods could be adopted to attain the outcomes.
2. Use of Video/Animation to explain functioning of various concepts.
3. Encourage collaborative (Group Learning) Learning in the class.
4. Ask at least three HOT (Higher order Thinking) questions in the class, which promotes critical thinking.
5. Adopt Problem Based Learning (PBL), which fosters students' Analytical skills, develop design thinking skills such as the ability to design, evaluate, generalize, and analyze information rather than simply recall it.
6. Introduce Topics in manifold representations.
7. Show the different ways to solve the same problem with different circuits/logic and encourage the students to come up with their own creative ways to solve them.
8. Discuss how every concept can be applied to the real world - and when that's possible, it helps improve the students' understanding.

#### **Module-1**

**Introduction to Databases:** Introduction, Characteristics of database approach, Advantages of using the DBMS approach, History of database applications.

**Overview of Database Languages and Architectures:** Data Models, Schemas, and Instances. Three schema architecture and data independence, database languages, and interfaces, The Database System environment.

**Conceptual Data Modelling using Entities and Relationships:** Entity types, Entity sets, attributes, roles, and structural constraints, Weak entity types, ER diagrams, Examples

**Textbook 1: Ch 1.1 to 1.8, 2.1 to 2.6, 3.1 to 3.7**

<b>Teaching-Learning Process</b>	Chalk and board, Active Learning, Problem based learning
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<b>Module-2</b>	
<b>Relational Model:</b> Relational Model Concepts, Relational Model Constraints and relational database schemas, Update operations, transactions, and dealing with constraint violations.	
<b>Relational Algebra:</b> Unary and Binary relational operations, additional relational operations (aggregate, grouping, etc.) Examples of Queries in relational algebra.	
<b>Mapping Conceptual Design into a Logical Design:</b> Relational Database Design using ER-to-Relational mapping.	
<b>Textbook 1: Ch 5.1 to 5.3, 8.1 to 8.5, 9.1;</b>	
<b>Teaching-Learning Process</b>	Chalk and board, Active Learning, Demonstration
<b>Module-3</b>	
<b>SQL:</b> SQL data definition and data types, specifying constraints in SQL, retrieval queries in SQL, INSERT, DELETE, and UPDATE statements in SQL, Additional features of SQL.	

<b>Advances Queries:</b> More complex SQL retrieval queries, Specifying constraints as assertions and action triggers, Views in SQL, Schema change statements in SQL. Database	
<b>Application Development:</b> Accessing databases from applications, An introduction to JDBC, JDBC classes and interfaces, SQLJ, Stored procedures, Case study: The internet Bookshop.	
<b>Textbook 1: Ch 6.1 to 6.5, 7.1 to 7.4; Textbook 2: 6.1 to 6.6;</b>	
<b>Teaching-Learning Process</b>	Chalk and board, Problem based learning, Demonstration
<b>Module-4</b>	
<b>Normalization: Database Design Theory</b> – Introduction to Normalization using Functional and Multivalued Dependencies: Informal design guidelines for relation schema, Functional Dependencies, Normal Forms based on Primary Keys, Second and Third Normal Forms, Boyce-Codd Normal Form, Multivalued Dependency and Fourth Normal Form, Join Dependencies and Fifth Normal Form. Examples on normal forms.	
<b>Normalization Algorithms:</b> Inference Rules, Equivalence, and Minimal Cover, Properties of Relational Decompositions, Algorithms for Relational Database Schema Design, Nulls, Dangling tuples, and alternate Relational Designs, Further discussion of Multivalued dependencies and 4NF, Other dependencies and Normal Forms	
<b>Textbook 1: Ch 14.1 to -14.7, 15.1 to 15.6</b>	
<b>Teaching-Learning Process</b>	Chalk& board, Problem based learning

### Module-5

**Transaction Processing:** Introduction to Transaction Processing, Transaction and System concepts, Desirable properties of Transactions, Characterizing schedules based on recoverability, Characterizing schedules based on Serializability, Transaction support in SQL.

**Concurrency Control in Databases:** Two-phase locking techniques for Concurrency control, Concurrency control based on Timestamp ordering, Multiversion Concurrency control techniques, Validation Concurrency control techniques, Granularity of Data items and Multiple Granularity Locking.

**Textbook 1: Ch 20.1 to 20.6, 21.1 to 21.7;**

**Teaching-Learning Process** | Chalk and board, MOOC

#### Course Outcomes

At the end of the course the student will be able to:

- CO 1. Identify, analyze and define database objects, enforce integrity constraints on a database using RDBMS
- CO 2. Use Structured Query Language (SQL) for database manipulation and also demonstrate the basic of query evaluation.
- CO 3. Design and build simple database systems and *relate* the concept of transaction, concurrency control and recovery in database
- CO 4. Develop application to interact with databases, relational algebra expression.
- CO 5. Develop applications using tuple and domain relation expression from queries.

#### Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination (SEE), and a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together

#### Continuous Internal Evaluation:

Three Unit Tests each of **20 Marks (duration 01 hour)**

1. First test at the end of 5<sup>th</sup> week of the semester
2. Second test at the end of the 10<sup>th</sup> week of the semester
3. Third test at the end of the 15<sup>th</sup> week of the semester

Two assignments each of **10 Marks**

4. First assignment at the end of 4<sup>th</sup> week of the semester
5. Second assignment at the end of 9<sup>th</sup> week of the semester

Group discussion/Seminar/quiz any one of three suitably planned to attain the COs and POs for **20 Marks (duration 01 hours)**

6. At the end of the 13<sup>th</sup> week of the semester

The sum of three tests, two assignments, and quiz/seminar/group discussion will be out of 100 marks and will be **scaled down to 50 marks**

(to have less stressed CIE, the portion of the syllabus should not be common /repeated for any of the methods of the CIE. Each method of CIE should have a different syllabus portion of the course).

**CIE methods /question paper has to be designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.**



**Semester End Examination:**

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the subject (**duration 03 hours**)

1. The question paper will have ten questions. Each question is set for 20 marks. Marks scored shall be proportionally reduced to 50 marks.
2. There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), **should have a mix of topics** under that module.

The students have to answer 5 full questions, selecting one full question from each module

**Suggested Learning Resources:****Textbooks**

1. Fundamentals of Database Systems, Ramez Elmasri and Shamkant B. Navathe, 7th Edition, 2017, Pearson.
2. Database management systems, Ramakrishnan, and Gehrke, 3rd Edition, 2014, McGraw Hill

**Reference Books:**

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1. <https://www.youtube.com/watch?v=3EIllovevfcA>
2. <https://www.youtube.com/watch?v=9TwMRs3qTcU>
3. <https://www.youtube.com/watch?v=ZWl0Xow304I>
4. <https://www.youtube.com/watch?v=4YilEjkNPrQ>
5. <https://www.youtube.com/watch?v=CZTkgMoqVss>
6. <https://www.youtube.com/watch?v=Hl4NZB1XR9c>
7. [https://www.youtube.com/watch?v=EGEwkad\\_IIA](https://www.youtube.com/watch?v=EGEwkad_IIA)
8. <https://www.youtube.com/watch?v=t5hsV9lC1rU>

**Activity Based Learning (Suggested Activities in Class)/ Practical Based learning**

**Demonstration of real time Database projects** - E-commerce Platform, Inventory Management, Railway System, College Data Management, Library Data Management, Solution for Saving Student Records, Hospital Data Management, Blood Donation Management.



**DEPARTMENT OF CSE**

**LESSON PLAN FOR ODD SEMESTER FOR ACADEMIC YEAR 2023 - 2024**

Course Title: Database Management System	Course Code : 21CS53
Teaching Hours/Week: L:T:P:S :: 3 : 0 : 0: 0	End Term Marks :50
Internal Marks : 40	
Semester : V	Academic year : 2023-24
Lesson plan Author: Mrs. Archana Bhat	Date : 17/10/2023

**Course learning objectives:**

- CLO1. Provide a strong foundation in database concepts, technology, and practice.
- CLO2. Practice SQL programming through a variety of database problems.
- CLO3. Demonstrate the use of concurrency and transactions in database
- CLO4. Design and build database applications for real world problems.

**Course Outcomes:**

At the end of the course the student will be able to:

- CO 1. Identify, analyze and define database objects, enforce integrity constraints on a database using RDBMS
- CO 2. Use Structured Query Language (SQL) for database manipulation and also demonstrate the basic of query evaluation.
- CO 3. Design and build simple database systems and relate the concept of transaction, concurrency control and recovery in database
- CO 4. Develop application to interact with databases, relational algebra expression.
- CO 5. Develop applications using tuple and domain relation expression from queries

**Module 1**

Week	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
1	<b>Introduction to Databases:</b> Introduction, Characteristics of database approach	L1,L2	CO1
	Advantages of using the DBMS approach, History of database applications.	L1,L2	CO1
	<b>Overview of Database Languages and Architectures:</b> Data Models, Schemas, and Instances, Three schema architecture and data independence	L1,L2	CO1
2	Database languages, and interfaces, The Database System environment	L1,L2	CO1
	<b>Conceptual Data Modeling using Entities and Relationships:</b> Entity types, Entity sets, attributes	L1,L2	CO3
	Roles, and structural constraints	L1,L2	CO3
3	Weak entity types	L1,L2	CO3
	ER diagrams, examples	L2,L3	CO3
	Specialization and Generalization	L1,L2	CO3

## Module 2

Week	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
4	<b>Relational Model:</b> Relational Model Concepts	L1,L2,L3	CO1
	Relational Model Constraints and relational database schemas	L1,L2,L3	CO1
	Update operations, transactions, and dealing with constraint violations	L1,L2,L3	CO1
5	<b>Relational Algebra:</b> Unary and Binary relational operations	L1,L2,L3	CO4
	Additional relational operations (aggregate, grouping, etc.)	L1,L2,L3	CO4
	Examples of Queries in relational algebra	L2,L3	CO4
6	<b>FIRST CIE</b>		
	<b>Mapping Conceptual Design into a Logical Design:</b> Relational Database Design using ER-to-Relational mapping	L2, L3	CO3

## Module 3

Week	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
7	<b>SQL:</b> SQL data definition and data types, Specifying constraints in SQL	L2, L3	CO2
	Retrieval queries in SQL	L2, L3	CO2
	INSERT, DELETE, and UPDATE statements in SQL	L2, L3	CO2
8	Additional features of SQL	L2, L3	CO2
	<b>Advanced Queries:</b> More complex SQL retrieval queries	L2, L3	CO2
	Specifying constraints as assertions and action triggers	L2, L3	CO2
9	Views in SQL, Schema change statements in SQL	L2, L3	CO2
	<b>Database Application Development:</b> Accessing databases from applications	L2, L3	CO5
	An introduction to JDBC, JDBC classes and interfaces	L1, L2	CO5
10	SQLJ	L1, L2	CO5
	Stored procedures, Case study: The internet Bookshop	L1, L2	CO5
	Case study: The internet Bookshop	L2, L3	CO5
11	<b>SECOND CIE</b>		

### Module 4

Week	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
11	<b>Normalization: Database Design Theory</b> – Introduction to Normalization using Functional and Multivalued Dependencies; Informal design guidelines for relation schema	L2, L3	CO3, CO5
	Functional Dependencies, Normal Forms based on Primary Keys	L2, L3	CO3, CO5
12	Second and Third Normal Forms, Boyce-Codd Normal Form	L2, L3	CO3, CO5
	Multivalued Dependency and Fourth Normal Form, Join Dependencies and Fifth Normal Form.	L2, L3	CO3, CO5
	<b>Normalization Algorithms:</b> Inference Rules, Equivalence, and Minimal Cover.	L2, L3	CO3, CO5
13	Properties of Relational Decompositions	L2, L3	CO3, CO5
	Algorithms for Relational Database Schema Design, Nulls, Dangling tuples and alternate Relational Designs	L2, L3	CO3, CO5

### Module 5

Week	Contents of Module	Bloom's Taxonomy Level	Course Outcome (CO)
13	Desirable properties of Transactions, characterizing schedules based on recoverability	L1, L2	CO3
14	Desirable properties of Transactions, characterizing schedules based on recoverability	L1, L2	CO3
	Transaction support in SQL	L1, L2	CO3
	<b>Concurrency Control in Databases:</b> Two-phase locking techniques for Concurrency control, Concurrency control based on Timestamp ordering	L1, L2	CO3
15	Multi version Concurrency control techniques, Validation Concurrency control techniques	L1, L2	CO3
	Granularity of Data items and Multiple Granularity Locking	L1, L2	CO3
THIRD CIE			

#### RBT Level

L1-Remembering L2-Understanding L3-Appling L4-Analysing L5-Evaluating L6-Creating

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4. <https://www.youtube.com/watch?v=4YiIEjkNPrQ>
5. <https://www.youtube.com/watch?v=CZTkgMoqVss>
6. <https://www.youtube.com/watch?v=H14NZB1XR9c>
7. [https://www.youtube.com/watch?v=EGEwkad\\_HIA](https://www.youtube.com/watch?v=EGEwkad_HIA)
8. <https://www.youtube.com/watch?v=t5hsV9lC1rU>



Signature of Faculty



Signature of HOD

# CITY ENGINEERING COLLEGE

## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING



### Question Bank

**COURSE NAME: DATABASE MANAGEMENT SYSTEMS**

**COURSE CODE:21CS53**

**SEMESTER: V**

**SECTION: A, B & C**

### MODULE 1

1. Define Database and DBMS. With a neat diagram explain the database system environment.
2. Describe the characteristics of the database approach.\*
3. Explain the types of end users with suitable examples.
4. What are the responsibilities of the DBA and Database Designer?
5. Discuss the advantage of using Database approach.\*

OR

List and discuss the advantages of DBMS over File system.

6. Define Database Model, Schema, Instance and Database state.
7. Explain a three-schema architecture with a neat diagram. Why do we need mapping between schema levels?\*
8. Discuss Database languages and the different types of user friendly interfaces.
9. Explain the component modules of DBMS and their interaction with the help of a diagram.\*
10. List and explain the criteria for classification of DBMS.
11. Explain with block diagram the different phases of database design.
12. Explain different types of attributes that occur in the ER diagram model with examples.
13. Define the following terms  
Entity, Weak entity, DBMS catalog, Snapshot, Value sets, Cardinality ratio, Degree of a relationship, Cardinality, Program data independence.
14. What are the structural constraints on a relationship type? Explain with examples.  
ER Diagram related questions
15. Write an ER diagram to represent CAR entity type with 2 key attributes Registration and Vehicle ID.
16. Write an ER diagram for hospital management considering at least four entities.
17. Draw an ER diagram for an AIRLINES database schema with atleast five entities. Also specify primary key and structural constraints.
18. Design an ER diagram for an employee database with at least four entities considering all the constraints.
19. Draw an ER diagram of the movie database. Assume your own entities, attributes and relationships.

20. Draw an ER diagram of an airline reservation system, taking into account at least five entities. Indicate all keys, constraints and assumptions that are made. 9. Define snapshot, metadata, intention and database.
21. Draw an ER diagram of Banking System taking into account at least five entities; indicate all keys, constraints and assumptions that are made.
22. Draw the ER diagram for an Employee database. The constraints are as follows:
  - An employee works for a department
  - Every department is headed by a manager
  - An employee works on one or more projects
  - An employee has dependents
  - A department controls the projects.

## MODULE 2

1. Define the following : Domain, relation schema, relation state, arity.
2. List and briefly explain the characteristics of Relations.
3. What is NULL? What is its importance? How are these values handled in relational models?
4. Explain the terms key, super key, candidate key, primary key, foreign key
5. Explain the different relational model constraints.
6. Explain in detail about various key constraints used in the database system.
7. Explain the entity integrity and referential integrity constraints. Why is each considered important? Give examples.
8. How is referential integrity constraint implemented in SQL?
9. What are the basic operations that can change the states of relations in the database?
10. Explain how the basic operations deal with constraints violations.\*
11. By considering an example, describe various data update operations in SQL.

OR

Explain about different DML operations.

12. Discuss in detail the operators SELECT, PROJECT with suitable examples.
13. Explain the relational algebra operations from Set theory, with examples.
14. Explain different types of JOIN operations with suitable examples for each.
15. Explain the ER to relational mapping algorithm with suitable examples for each step.\*

Queries using Relational Algebra Notation

16. Consider the following schema:
  - EMP(name, id, age, salary)
  - Works\_for(pid, eid, #hours)
  - Proj(pid, name)
 Write the relational algebra for the following.
  - i) Retrieve employee name and employee id who works for all the projects.
  - ii) Retrieve employee name and age whose salary > 1000
  - iii) For each employee, get the number of projects and number of hours worked on projects
  - iv) Retrieve the employee name who is working for 'CSE' project.
17. Write the relational algebra operations to perform the following queries:
  - i) Retrieve the name and address of all employees who work for the "Accounts" department.
  - ii) Retrieve the names of employers who have no dependents.
  - iii) Find the names of employees who work on all the projects controlled by department number 2.
18. By referring the following database schema
  - Employee(Fname, Minit, Name, SSN, Bdate, Address, Sex, Salary, Sup\_SSN, Dno)
  - Department(Dname, Dnumber, Mgr\_SSN, Mgr\_Start\_date)
  - Dept\_Locations(Dnumber, Location)
  - Project(Pname, Number, Plocation, Dnum)

Works\_On(Essn, Pno, Hours)

Dependent(Essn, Dependent\_Name, ex, Bdate, Relationship)

Write the relational algebra expressions for the following queries

- i) Retrieve all the employee names who are working for department number 5.
- ii) Retrieve all the projects which are controlled by department number 4.
- iii) Retrieve the names of employees who have no dependents
- iv) Retrieve all the employee Name who is working on all the projects in which John Smith works on.
- v) Retrieve all the project numbers along with number of employee working on each project

19. Given the following schema:

Emp(Fname, Name, SSN, Bdate, Address, Gender, Salary, SuperSSN, Dno)

Dept( Dname, Dnumber, MgrSSN, Mgrstartdate)

Dept\_loc(Dnumber, Dloc)

Project(Pname, Number, Ploc, Dnum)

Works\_on(ESSN, Pno, Hour)

Dependent(ESSN, Dependent\_name, Gender, Bdate, Relationship)

Give the relation algebra expression for the following:

- i) Retrieve the name of the manager of each department.
- ii) For each project retrieve the project number, project name and number of employees who worked on the project.
- iii) Retrieve the names of employees who work on all the projects controlled by department 5.
- iv) Retrieve the name of employees who have no dependents.
- v) Retrieve the number of Male and Female employees working in the company.

20. Given the schema:

Passenger(PID, Pname, Pgender, Pcity)

Agency(AID, Aname, Acity)

Flight(FID, FDate, Time, Src, Dest)

Booking(Pid, Aid, Fid, FDate)

Give relation algebra expression for the following:

- i) Get the complete details of all flights to new Delhi
- ii) Find only the flight numbers for passenger with paid 123 for flights to Chennai before 06.11/2020
- iii) Find the passenger names for those who do not have any bookings in any flights
- iv) Get the details of flights that are scheduled on both dates 01/12/2020 and 02/12/2020 at 16:00 hours
- v) Find the details of all male passengers who are associated with jet agency

### MODULE 3

1. In SQL which command is used for table creation? Explain how constraints are specified in SQL during table creation with suitable example.
2. Explain the data types available for attribute specification in SQL.
3. Discuss EXISTS and UNIQUE functions in SQL.
4. Illustrate insert, delete, update, alter and drop statements in SQL.
5. Discuss how each of the following constructs is used in SQL and discuss the various options for each construct:
  - i) Nested queries
  - ii) aggregate functions
  - iii) schema change statements
  - iv) Group by and having clause
6. How do you create a view in SQL? Give examples. Can you update a view table? If yes, how? If not, why not? Discuss.



7. What are assertions and triggers in SQL? Write a SQL program to create an assertion to specify the constraint that the salary of an employee must not be greater than the salary of the department. Add this constraint to works\_for relation in the COMPANY database.
  8. Write a trigger in SQL to call a stored procedure INFORM\_SUPERVISOR() whenever a new record is inserted or updated, check whether an employee's salary is greater than the salary of his or her direct supervisor in the COMPANY database.
  9. With example, explain the following: i) JDBC ii) Correlated queries iii) Stored Procedure iv) Schema change statements in SQL
  10. With the program segment, explain retrieving of tuples with embedded SQL in C.
  11. What is dynamic SQL and how is it different from Embedded SQL?
  12. What is SQLJ and how is it different from JDBC?
  13. Define stored procedure. Explain the creating and calling of stored procedure with suitable examples.
  14. What is a cursor? Explain with example, retrieving multiple tuples with embedded SQL.
  15. Write a complete high level language program (in Java or C) to display the rows of a customer table created in oracle having columns with embedded SQL.
  16. By referring the following database schema  
Employee(Fname, Minit, Name, SSN, Bdate, Address, Sex, Salary, Sup\_SSN, Dno)  
Department(Dname, Dnumber, Mgr\_SSN, Mgr\_Start\_date)  
Dept\_Locations(Dnumber, Location)  
Project(Pname, Number, Plocation, Dnum)  
Works\_On(Essn, Pno, Hours)  
Dependent(Essn, Dependent\_Name, ex, Bdate, Relationship)  
Specify the following queries in SQL on the database schema given above.
    - i) For every project located in 'Stafford', list the project number, the controlling department number and the department manager's last name, address and birthdate.
    - ii) Retrieve the birth date and address of the employees whose name is 'John B, Smith'
    - iii) Retrieve the name and address of all employees who work for the 'Research' department.
    - iv) Retrieve each department number, number of employees and their average salary
    - v) Retrieve the name of employees with 2 or more dependents.
    - vi) List female employees from Dno = 20 earning more than 50000
    - vii) Make a list of all project numbers for projects that involve an employee whose last name is 'Smith', either as a worker or as a manager of the department.
    - viii) For each project, retrieve the project number, the project name, and the number of employees who work on that project.
    - ix) List the name of managers who have at least one dependent
1. Write the SQL queries for the following database schema:  
Student(USN, NAME, BRANCH, PERCENTAGE)  
Faculty(FID, FNAME, DEPARTMENT, DESIGNATION, SALARY)  
Course(CID, CNAME, FID)  
Enroll(CID, USN, GRADE)
    - i) Retrieve the names of all students enrolled for the course 'CS\_54'
    - ii) List all the departments having an average salary of the faculties above Rs. 10,000
    - iii) List the names of the students enrolled for the course 'CS\_51' and having 'B' grade.
  1. Write SQL query for the following schema:  
Employee(employee\_name, street, city)  
Works(employee\_name, company\_name, salary)  
Company(company\_name, city)  
Manages(employee\_name, manager\_name)

- i) Find the names, street address, and cities of residence for all employees who work for 'First Bank Corporation' and earn more than \$10,000
- ii) Find the names of all employees who do not work for 'First Bank Corporation'. Assume that all people work for exactly one company.
- iii) Find the names of all employees in the database who earn more than every employee of 'Small Bank Corporation'. Assume that all people work for at most one company.
- iv) Find the name of the company that has the smallest payroll.
- v) Find the name of all employees in the database who live in the same cities and on the same streets as do their managers.

## MODULE 4

1. Discuss the informal guidelines to determine the quality of relations schema design with a suitable example.
2. Discuss the Insertion, Deletion and Modification anomalies. Illustrate, why are they considered bad, with an example.
3. What do you mean by normalization? Explain 2NF and BCNF with a suitable example for each.
4. What is the need for normalization? Explain 1NF, 2NF and 3NF with examples.
5. What is BCNF? How is it different from 3NF? Prove that a relation with two attributes is always in BCNF.
6. Which normal form is based on transitive functional dependencies and full functional dependency? Explain the same with example.
7. What is functional dependency? Explain the inference rules for functional dependency with proof. List the conditions for a set of functional dependencies to be minimal.
8. Define 4NF. When it is violated? Why is it useful?
9. What do you understand by attribute closure? Give an example. Write an algorithm to find closure of attribute.
10. Explain the properties of relational decomposition.
11. Write an algorithm to find a minimal cover F for a set of functional dependencies E. Construct the minimal cover m for set of functional dependencies which are:  
E: {B->A, D->A, AB->D}
12. What is the dependency preservation property for decomposition? Why is it useful?
13. Write the algorithm for testing non additive join property.
14. Explain armstrong inference rules
15. Describe the three main techniques to achieve the first normal form for the relation by taking the following example schema.
16. Consider the relation R(A, B, C, D, E, F) and the functional dependencies A->B, C->DF, AC->E, D->F. What is the primary key of this relation R? What is the highest normal form? Preserving the dependency, decompose R into third normal form.
17. Let R = {SSN, Ename, Pnumber, Pname, Plocn, Hrs} and D={R1, R2, R3} where R1= Emp(SSN, Ename) R2=Proj(Pnumber, Pname, Plocn) R3=Works\_On(SSn, Pnumber, Hrs) The following functional dependency hold in R. F={SSN->Ename; Pname->{Pname, Plocn}; {SSN, Pnumber}->Hrs} Prove that above decomposition of relation 'R' has the lossless join property.
18. Consider the schema R=(A, B, C, D,E). Suppose the following dependencies hold E->A, CD->E, A->BC, B->D State whether the following decomposition of R are lossless join decomposition or not, justify. {(A, B, C), (A, D, E)} {(A, B, C), (C, D, E)}
19. Consider R={A,B,C,D,E,F}. FDs are {A->BC, C->E, CD->EF}. Show that AD->F.
20. Find the key and normalize. R(Book\_Title, Auth\_Name, Book\_Type, List\_Price, Affiliation,Publication) FDs are (Book\_Title-> {Book\_Type,Publication}); Auth\_Name->Affiliation; Book\_Type->List\_Price}

21. Given relation R with 4 attributes R=(A, B, C, D) and following FDs. Identify the candidate keys for R and highest normal form. i)  $C \rightarrow D, C \rightarrow A, B \rightarrow C$  ii)  $B \rightarrow C, D \rightarrow A$ .
22. Given below are two sets of FDs for a relation R(A, B, C, D, E). Are they equivalent?  
a.  $A \rightarrow B, AB \rightarrow C, D \rightarrow AC, D \rightarrow E$  b)  $A \rightarrow BC, D \rightarrow AE$
23. Consider the following universal relation R(A, B, C, D, E, F, G, H, I, J) and the set of functional dependencies.  $F = \{ \{A, B\} \rightarrow C; A \rightarrow \{D, E\}; B \rightarrow F; F \rightarrow \{G, H\}; D \rightarrow \{I, J\} \}$ . What is the key of R? Decompose R into 2NF and then 3NF relations.  
Determine whether each decomposition has the lossless join property with respect to F.  
 $D1 = \{R1, R2, R3\}; R2 = \{A, B, C, D, E\}; R3 = \{B, F, G, H\}; R4 = \{D, I, J\}$
23. Consider two sets of functional dependency  $F = \{A \rightarrow C, AC \rightarrow D, E \rightarrow AD, E \rightarrow H\}$  and  $G = \{A \rightarrow CD, E \rightarrow AH\}$ . Are they equivalent?
25. Consider the universal relation R=(U, C, L, A) and the set of functional dependencies.  $F = \{P \rightarrow LCA, LC \rightarrow AP, A \rightarrow C\}$ . Decompose the relation R into 3NF with dependency preservation and non-additive join property.
26. Consider the schema R = ABCD, subjected to FDs  $F = \{A \rightarrow B, B \rightarrow C\}$ , and the non binary partition  $D1 = \{ACD, AB, BC\}$ . State whether D1 is a lossless decomposition? [Give all steps in detail].

## MODULE 5

1. Define transaction. Discuss the ACID properties of database transaction and system log.\*
2. With a neat diagram explain the transition diagram of a transaction.
3. Why is concurrency control needed? Demonstrate with an example.\*
4. Explain types of problems that may occur when two simple transactions run concurrently.
5. Explain transaction support in SQL.
6. Briefly explain two-phase locking protocol.\*
7. Write a short note on
  - a) Single user and multi user systems
  - b) Transaction rollback and cascading rollback
  - c) Shadow paging
  - d) Deadlock prevention protocol
  - e) Database backup and recovery from catastrophic failure
8. What anomalies occur due to interleaved execution? Explain them with examples.
9. Explain different types of locks used in concurrency control.
10. How shadow paging helps to recover from transaction failure?\*
11. Discuss the timestamp ordering protocol for concurrency control.
12. What is serializability? How can serializability be ensured? Do you need to restrict concurrent execution of transactions to ensure serializability? Justify your answer.
13. When deadlock and starvation problems occur? How can these problems be resolved?\*

*Aachen*

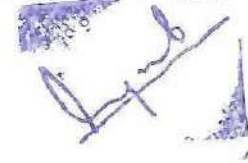
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COURSE CODE: 21CS53

**CITY ENGINEERING COLLEGE  
FIRST INTERNAL TEST**



Program Name: CSE

Course Name: Database Management Systems

Sem &amp; Sec: V SEM A, B, C

Max Marks: 40

Date: 04/01/2024

Time: 10:30AM – 12:00PM

Duration: 1 ½ hrs.

*Note: Answer all Questions selecting any ONE FULL question from each part.*

Q No.	SQ No.	Questions	Marks	BT Levels	CO's
<i>PART - A</i>					
1		Explain the component modules of DBMS and their interaction with the help of a diagram.	10	BT1, BT2	CO1
<i>Or</i>					
2	a. b.	Describe the characteristics of the database approach Explain a three-schema architecture with a neat diagram.	4 6	BT1, BT2	CO1
<i>PART - B</i>					
3		What are the structural constraints on a relationship type? Explain with examples.	10	BT1, BT2	CO3
<i>Or</i>					
4		Explain with block diagram the different phases of database design.	10	BT1, BT2	CO3
<i>PART - C</i>					
		Draw an ER diagram of an airline reservation system, taking into account at least five entities. Indicate all keys, constraints and assumptions that are made.	10	BT3, BT4	CO3
<i>Or</i>					
6	a. b.	Explain different types of attributes that occur in the ER diagram model with examples. Define the following: i) Database ii) DBMS iii) Weak entity iv) Snapshot v) Degree of a relationship	5 5	BT1, BT2	CO1, CO3
<i>PART - D</i>					
7		Illustrate insert, delete, update, alter and drop statements in SQL.	10	BT3	CO2
<i>Or</i>					

8	<p>In SQL which command is used for table creation? Explain how constraints are specified in SQL during table creation by considering EMPLOYEE and DEPARTMENT schemas as given below.  EMPLOYEE (Name, Emp_id, Aadhaar, D_Num, Salary)  DEPARTMENT(D_Num, D_Name, Location)</p> <p>Write SQL queries for the following:</p> <ol style="list-style-type: none"> <li>List the name of employees working in Department 5 with salary above 30000.</li> <li>Display the details of employees working in 'IT' department.</li> <li>Update the salary of the employee to 50000 whose id is 12.</li> </ol>	10	BT3, BT4	CO2
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**Bloom's Taxonomy Level:** BT1-Remembering BT2-Understanding BT3-Applying BT4-Analysing BT5-Evaluating BT6-Creating

**Course Outcomes:**

- CO 1. Identify, analyze and define database objects, enforce integrity constraints on a database using RDBMS.
- CO 2. Use Structured Query Language (SQL) for database manipulation and also demonstrate the basic of query evaluation.
- CO 3. Design and build simple database systems and relate the concept of transaction, concurrency control and recovery in database.
- CO 4. Develop application to interact with databases, relational algebra expression.
- CO 5. Develop applications using tuple and domain relation expression from queries.

# CITY ENGINEERING COLLEGE

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

## SCHEME FOR EVALUATION

CIE TEST I

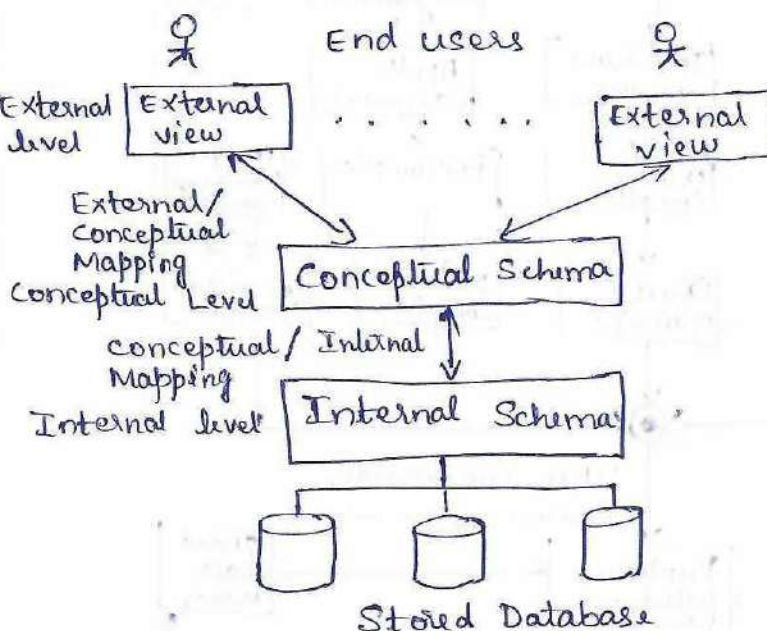
SEMESTER & SECTION: V - A, B & C

DATE: 04/11/2024

Q. No	Details of the Answer	Marks Distribution	Total marks
1.	<p><u>Part - A</u></p>	<p style="text-align: right;">Diagram - 5 M Explanation - 5 M</p>	10 M

Staff Signature: *Ash*

*[Signature]*  
HOD

Q. No	Details of the Answer	Marks Distribution	Total marks
2.a.	<p>Characteristics of the Database approach</p> <ul style="list-style-type: none"> <li>* Self describing nature of a database system</li> <li>* Insulation between programs and data, and data abstraction</li> <li>* Support of multiple views of data</li> <li>* Sharing of data and multiuser transaction processing.</li> </ul> <p style="text-align: center;">Each point with explanation</p>	1 M * 4	4M
2b.	<p>Three schema Architecture</p>  <p>The diagram illustrates the Three Schema Architecture. At the top, 'End users' are represented by stick figures. Below them are two boxes labeled 'External view' under the 'External Level'. Arrows point from these views to a central box labeled 'Conceptual Schema' under the 'Conceptual Level'. A double-headed arrow connects the 'Conceptual Schema' to a box labeled 'Internal Schema' under the 'Internal Level', with the label 'conceptual / Internal Mapping' next to it. Below the 'Internal Schema' are three cylinder icons representing the 'Stored Database'.</p> <p style="text-align: center;">Part-B.</p>	<p>Diagram - 3M</p> <p>Explanation - 3M</p>	6M
3.	<p>cardinality ratios</p> <ul style="list-style-type: none"> <li>* One-to one - 2M</li> <li>* One-to Many } - 2M</li> <li>* Many to one }</li> <li>* Many to Many - 2M</li> </ul> <p>Participation constraints</p> <ul style="list-style-type: none"> <li>* Partial - 2M</li> <li>* total - 2M</li> </ul> <p style="text-align: center;">Explanation with example 2M * 5</p>		10M

# CITY ENGINEERING COLLEGE

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

## SCHEME FOR EVALUATION

CIE TEST I

SEMESTER & SECTION: V - A, B & C

DATE: 04-1-24

Q. No	Details of the Answer	Marks Distribution	Total marks
4.	<p style="text-align: center;"><u>Phases of Database Design.</u></p> <p style="text-align: right; margin-top: 20px;">Diagram - 6M Explanation - 4M</p>		10M

Staff Signature: Aeel

**HOD**



Q. No	Details of the Answer	Marks Distribution	Total marks
	<u>Part - c</u>		
5.	Identifying Entities and its attributes - 5M Relationship between entities - 2M key constraints and participation constraints - 3M		10M
6a.	Simple, composite, single valued, Multivalued derived attributes. Explanation with example - 1M * 5		5M
6b.	i) Database - collection of related information - 1M ii) DBMS - General purpose software system that facilitates the process of identifying, defining, constructing manipulating & sharing of data among various users & applications - 1M iii) Weak Entity - which does not have key attribute of its own - 1M iv) Snapshot - Data in the database at a particular moment in time. - 1M v) Degree of Relationship - number of participating entities in the relationship - 1M		5M
	<u>Part - D.</u>		
7.	Explanation with examples of following insert, delete, update, alter and drop Each carries 2M - 2M * 5		10M
8.	CREATE TABLE DEPARTMENT (D-Num int primary key, D-Name varchar(20) not null, Location varchar(20)); - 2M		

# CITY ENGINEERING COLLEGE

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

## SCHEME FOR EVALUATION

CIE TEST I

SEMESTER & SECTION: V A, B & C

DATE: 04-01-2024

Q. No	Details of the Answer	Marks Distribution	Total marks
	<pre>CREATE TABLE EMPLOYEE (Name varchar(20) not null, Emp-id int primary key, Aadhaar int unique, Salary numeric(10,2) default 1000, D-num int, Foreign key (D-num) references DEPARTMENT (D-Num), check (Salary &gt;= 1000 and salary &lt;= 50000));</pre>	3M	10M
a)	<pre>Select Name from EMPLOYEE where D-Num = 5 and salary &gt; 30000;</pre>	1M	
b)	<pre>select * from EMPLOYEE, DEPARTMENT where EMPLOYEE.D-NUM = DEPARTMENT.D-NUM and D-NAME = 'IT';</pre>	2M	
c)	<pre>Update EMPLOYEE set Salary = salary + 50000 where Emp-id = 12;</pre>	2M	

Staff Signature: Asil

  
HOD



# CITY ENGINEERING COLLEGE

## Department of Computer Science and Engineering

### Quiz

**Course Name: Database Management Systems**

**Course Code: 21CS53**

Name:

Date:

USN:

Sem & Section:

1. Which of the following relational algebra operations do not require the participating tables to be union-compatible?  
A. Union B. Intersection C. Difference D. Join
2. If two relations R and S are joined, then the non matching tuples of both R and S are ignored in  
A. left outer join B. right outer join C. full outer join D. inner join
3. The keyword to eliminate duplicate rows from the query result in SQL is.  
A. DISTINCT B. NO DUPLICATE C. UNIQUE D. None of the above
4. In SQL, testing whether a sub query is empty is done using  
A. DISTINCT B. UNIQUE C. NULL D. EXISTS
5. If the closure of an attribute set is the entire relation, then the attribute set is a \_\_\_\_\_ .  
A. Super Key B. Candidate Key C. Primary Key D. Not a Key
6. In 2NF  
A. No functional dependency exists  
B. No Multi valued dependency exists  
C. No partial dependency exists  
D. No partial MVDs exists
7. A set of column that identifies every row in a table.  
A. composite key B. candidate key C. foreign key D. super key
8. To pass on granted privileges to other user which clause is used?  
A. create option B. grant option C. update option D. select option
9. The clause ALTER TABLE in SQL can be used to  
A. add an attribute  
B. deletes an attribute  
C. alter the default values of an attribute  
D. all of the above
10. What is a data integrity?  
A. It is the data contained in database that is non redundant.  
B. It is the data contained in database that is accurate and consistent.  
C. It is the data contained in database that is secured.  
D. It is the data contained in database that is shared.

11. The collection of information stored in a database at a particular moment is called as .....  
A. Schema    B. Instance of the Database    C. Data domain    D. Independence
12. Any SQL statement inside an embedded SQL program must be inside the boundaries of ....  
A. EXE SQL and END  
B. EXEC SQL and END  
C. EXEC and END-EXEC  
D. EXEC SQL and END-EXEC
13. Which are the two ways in which entities can participate in a relationship?  
A. Passive and active  
B. Total and partial  
C. Simple and Complex  
D. All of the above
14. In ER diagram double line indicate  
A. Total Participation  
B. Multiple Participation  
C. Cardinality N  
D. None of the above
15. Consider the join of relation R with a relation S. If R has m tuples and S has n tuples, then the maximum and minimum size of the join respectively are  
A.  $m+n$  and 0  
B.  $m+n$  and  $m-n$   
C.  $mn$  and 0  
D.  $m+n$  and  $m+n$

Year : 2023 - 2024

Semester : Odd / Even

Name of the Teacher : Mrs. Archana Bhat

Designation : Asst. Professor

Department : Computer Science & Engineering

Sem/Branch	Subject Code	Subject
1. $\sqrt{\quad}$ CS - A	21 CS 53	DBMS
2. $\sqrt{\quad}$ CS - B	21 CS 53	DBMS
3. $\sqrt{\quad}$ CS - C	21 CS 53	DBMS

	Initials at the End of the			
	1st Month	2nd Month	3rd Month	Semester
Staff	Aeel 22/12/24	Aeel 29/01/24	Aeel 29/2/24	Aeel
HOD	Hyib	Hyib	Hyib	Hyib
Principal	<del>Int Swarni</del>	<del>Int Swarni</del>	<del>Int Swarni</del>	<del>Int Swarni</del>



### ATTENDANCE

Sl. No.	Reg. No.	Name
1	ICE21CS001	A. C. VIMAL GOWDA
2	ICE21CS002	ABHISHEK M.G
3	ICE21CS005	AJAY
4	ICE21CS006	AKSHITHA S
5	ICE21CS008	ANAND
6	ICE21CS009	ANANYA YADAV
7	ICE21CS010	ANJANEYA V
8	ICE21CS012	ANKUSH KUMAR
9	ICE21CS013	ASHISH S.D
10	ICE21CS015	ASHWINI S
11	ICE21CS016	AYESHA KALEEM
12	ICE21CS017	BEERESH N
13	ICE21CS019	BHARATH KUMAR J
14	ICE21CS020	BHARATH REDDY G
15	ICE21CS022	BHARATH S
16	ICE21CS024	CHANDRALEKHA S
17	ICE21CS025	CHANDRASHEKAR M.R
18	ICE21CS026	CHEZHAN H.S
19	ICE21CS027	CHINMAYI L
20	ICE21CS029	DARSHAN K.M
21	ICE21CS031	DARSHAN M.Y
22	ICE21CS032	DARSHAN S
23	ICE21CS034	DHANUSH R
24	ICE21CS035	DIKSHA P.S
25	ICE21CS036	G. S. BHARATHI
	No. of Absents	
	Initials	

III	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
22	23	24	25	26	27	28	29	30	31		
20	21	22	23	24	A	25	26	27	28		
17	18	19	20	21	22	23	24	25	26		
17	18	19	20	21	22	23	24	25	26		
A	31	22	23	24	25	26	27	28	A		
18	19	20	21	22	23	24	25	26	27		
20	21	22	23	24	25	26	27	28	A		
18	19	20	21	22	A	23	24	25	26		
19	20	21	22	23	24	25	26	27	28		
22	23	24	25	26	27	28	29	30	31		
20	21	22	23	24	25	26	27	28	29		
20	21	22	23	24	25	26	27	28	A		
18	19	20	21	22	23	24	25	26	27		
21	22	23	24	25	26	A	27	28	29		
18	19	20	21	22	23	24	25	26	27		
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19	20	21	22	23	24	25	26	27	28		
21	22	23	24	25	26	27	28	29	30		
A	20	21	22	23	24	25	26	27	28		

### ASSESSMENT

V- CS 'A' Section  
DBMS (21CS53)

tn.	Test Marks	Sessional Marks	Remarks						
	T1	T2	T3	4	5	A1 (10M)	A2 (10M)	C (5)	B (15)
29	30	31	32	33	34	35	36	37	
27	28	29	30	31	32	33	34	35	
27	28	29	30	31	32	33	34	35	
29	30	31	A	32	33	34	35	A	
28	29	30	31	32	A	33	34	35	
29	30	31	32	33	34	35	36	37	
27	28	29	30	31	32	33	34	35	
29	30	31	32	33	34	35	A	36	
32	33	34	35	36	37	38	39	A	
30	A	31	32	33	34	35	36	37	
29	30	31	A	32	33	34	35	36	
28	29	30	31	32	33	34	35	36	
30	31	32	A	33	34	35	A	36	
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28	29	30	31	32	A	33	34	35	
30	31	A	32	33	34	35	36	37	
32	33	34	35	A	36	37	38	39	
31	32	33	34	35	36	37	38	39	
30	31	32	33	34	35	36	37	28	
29	30	31	32	33	34	35	36	37	
31	32	33	34	35	36	37	A	38	
29	30	31	32	33	34	35	36	A	

tn.	Test Marks	Sessional Marks	Remarks							
	T1	T2	T3	4	5	A1 (10M)	A2 (10M)	C (5)	B (15)	
	11	17	19			42	10	9	5	13
	8	7	10			32	10	10	5	14
	04	08	11			30	9	10	5	12
	12	17	15			41	10	10	5	13
	08	17	06			33	9	10	5	11
	12	17	13			38	10	10	5	9
	14	09	08			35	9	10	5	15
	06	08	08			28	8	8	5	11
	10	12	12			36	10	10	5	12
	20	20	20			49	10	10	5	12
	16	18	18			45	10	10	5	12
	10	09	06			31	8	10	5	14
	11	13	15			38	9	10	5	13
	16	20	18			46	10	10	5	13
	09	12	08			34	10	10	5	13
	17	15	13			40	9	10	5	11
	16	13	09			38	9	10	5	14
	17	14	16			43	10	10	5	14
	20	19	20			49	10	10	5	13
	09	12	10			35	10	10	5	13
	09	12	13			36	09	10	5	13
	15	11	08			36	10	10	5	13
	9	13	10			33	8	8	5	12
	16	18	20			46	10	10	5	12
	10	8	9			34	9	0	0	11

## ATTENDANCE

Sl. No.	Reg. No.	Name	Date											
			25	26	27	28	29	30	31	01	02	03	04	
			1	2	3	4	5	6	7	8	9	10	11	
26	ICE@ICS037	GANESH DIWAKAR	1	2	A	A	3	4	5	6	7	8	9	
27	ICE@ICS038	GANESH METI	A	A	1	2	3	4	5	6	7	8	9	
28	ICE@ICS039	GANGOTRI V	A	1	2	3	A	4	5	6	7	8	9	
29	ICE@ICS040	GODHA M	1	2	3	4	5	6	7	8	9	10	11	
30	ICE@ICS041	HARISHA C	1	2	3	4	A	5	6	7	8	9	10	
31	ICE@ICS042	HARSHA VARDHAN S.M	A	A	1	2	3	4	5	6	7	8	9	
32	ICE@ICS045	HARSHITHA M	A	A	1	2	3	4	5	6	7	8	9	
33	ICE@ICS048	HARSHITHA S.P	A	A	1	2	3	4	5	6	7	8	9	
34	ICE@ICS049	HASTATH KHAN	A	A	1	2	A	3	4	5	6	7	8	
35	ICE@ICS052	IMDAD UL HAQ V.I	A	A	1	2	A	3	4	5	6	7	8	
36	ICE@ICS054	JALSHANKAR REDDY V	A	1	2	3	4	5	6	7	8	9	10	
37	ICE@ICS055	JAYANTH N	1	A	2	3	4	5	6	7	8	9	10	
38	ICE@ICS056	KAVYASHREE V	1	2	3	4	5	6	7	8	9	10	11	
39	ICE@ICS058	KEERTHANA S	A	A	1	2	3	4	5	6	7	8	9	
40	ICE@ICS059	KEERTHANA U	A	A	1	2	3	4	5	6	7	8	9	
41	ICE@ICS060	KIRAN M	A	A	1	2	3	4	5	6	7	8	9	
42	ICE@ICS061	KISHAN A	A	A	1	2	3	4	5	6	7	8	9	
43	ICE@ICS062	KOMMINDALA PREM KUMAR	1	2	3	2	A	5	6	A	7	8	9	
44	ICE@ICS063	KRUTHIK B.R	A	1	2	3	4	5	6	7	8	9	10	
45	ICE@ICS064	M. HARSHITHA	1	2	3	4	A	5	6	7	8	9	10	
46	ICE@ICS068	MEGHANA N	1	2	3	4	5	6	7	8	9	10	11	
47	ICE@ICS070	MOHAMMAD JAFAR	1	2	3	4	5	6	7	8	9	10	11	
48	ICE@ICS071	MOHAMMED ARHAM	A	1	2	3	4	A	5	6	7	8	9	
49	ICE@ICS072	MOHAMMED DAWOOD	A	A	1	2	3	4	5	6	7	8	9	
50	ICE@ICS079	MOHAN KRISHNA D	A	A	1	2	3	4	5	6	7	8	9	
No. of Absents														
Initials														

## ASSESSMENT

Attn.	Test Marks					Sessional Marks	Remarks								
	T1	T2	T3	4	5		A1 (10M)	A2 (10M)	course (5M)	Quiz (5M)					
	12	13	14	15	16		17	18	19	20	21				
10	A	11	12	13	A	14	15	16	17		28	8	10	5	8
10	A	11	12	A	13	14	15	16	17		43	10	10	5	13
10	A	12	13	A	A	14	15	16	17		36	10	10	5	13
12	13	13	A	A	14	15	16	17	18		47	10	10	5	14
11	12	13	14	15	16	17	18	19	20		47	10	10	5	14
10	A	11	12	13	14	15	16	17	18		38	10	10	5	13
10	11	12	13	14	15	16	17	18	19		39	10	10	5	13
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10	11	12	A	13	14	15	16	17	18		27	10	10	5	04
10	11	12	13	14	15	16	17	18	19		30	6	6	5	14
10	11	12	13	14	15	16	17	18	19		32	8	9	5	13
Attn.			Attn.					Attn.				Attn.			





# CITY ENGINEERING COLLEGE

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

## LESSON PLAN 2023 - 24

**COURSE TITLE:** Database Management Systems

**FACULTY NAME:** Mrs. Archana Bhat

**SUBJECT CODE:** 21CS53

**SEM:** IV

**SEC:** A

Week	Date		Topics Planned
	From	To	
I	27/11/23	01/12/23	<b>MODULE 1: Introduction to Databases:</b> Introduction, Characteristics of database approach, Advantages of using the DBMS approach, History of database applications, <b>Overview of Database Languages and Architectures:</b> Data Models, Schemas, and Instances, Three schema architecture and data independence
II	04/12/23	09/12/23	Database languages, and interfaces, The Database System environment, <b>Conceptual Data Modeling using Entities and Relationships:</b> Entity types, Entity sets, attributes, Roles, and structural constraints
III	11/12/23	15/12/23	Weak entity types, ER diagrams, examples, Specialization and Generalization
IV	18/12/23	23/12/23	<b>MODULE 2: Relational Model:</b> Relational Model Concepts, Relational Model Constraints and relational database schemas, Update operations, transactions, and dealing with constraint violations
V	26/12/23	30/12/23	<b>Relational Algebra:</b> Unary and Binary relational operations, Additional relational operations (aggregate, grouping, etc.), Examples of Queries in relational algebra
VI	01/01/24	05/01/24	<b>FIRST CIE</b> <b>Mapping Conceptual Design into a Logical Design:</b> Relational Database Design using ER-to-Relational mapping
VII	08/01/24	13/01/24	<b>MODULE 3: SQL:</b> SQL data definition and data types, specifying constraints in SQL, Retrieval queries in SQL, INSERT, DELETE, and UPDATE statements in SQL
VIII	15/01/24	20/01/24	Additional features of SQL, <b>Advanced Queries:</b> More complex SQL retrieval queries, Specifying constraints as assertions and action triggers
IX	22/01/24	27/01/24	Views in SQL, Schema change statements in SQL, <b>Database Application Development:</b> Accessing databases from applications, An introduction to JDBC, JDBC classes and interfaces



**CITY ENGINEERING COLLEGE**  
**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**  
**LESSON PLAN 2023 - 24**

**SUBJECT: Database Management Systems**

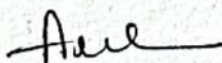
**FACULTY NAME: Mrs. Archana Bhat**

**SUBJECT CODE: 21CS53**

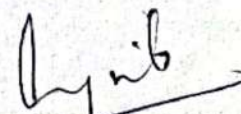
**SEM: IV**

**SEC: A**

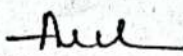
Week	Date		Topics Planned
	From	To	
X	29/01/24	02/02/24	SQLJ, Stored procedures, Case study: The internet Bookshop, Case study: The internet Bookshop
XI	05/02/24	10/02/24	<b>SECOND CIE</b> <b>MODULE 4: Normalization: Database Design Theory</b> – Introduction to Normalization using Functional and Multivalued Dependencies: Informal design guidelines for relation schema, Functional Dependencies, Normal Forms based on Primary Keys,
XII	12/02/24	16/02/24	Second and Third Normal Forms, Boyce-Codd Normal Form, Multivalued Dependency and Fourth Normal Form, Join Dependencies and Fifth Normal Form, <b>Normalization Algorithms: Inference Rules, Equivalence, and Minimal Cover</b>
XIII	19/02/24	24/02/24	Properties of Relational Decompositions, Algorithms for Relational Database Schema Design, Nulls, Dangling tuples and alternate Relational Designs, Desirable properties of Transactions, characterizing schedules based on recoverability
XIV	26/02/24	01/03/24	<b>MODULE 5: Desirable properties of Transactions, characterizing schedules based on recoverability, Transaction support in SQL, Concurrency Control in Databases: Two-phase locking, techniques for Concurrency control, Concurrency control based on Timestamp ordering</b>
XV	04/03/24	09/03/24	Multi version Concurrency control techniques, Validation Concurrency control techniques, Granularity of Data items and Multiple Granularity Locking <b>THIRD CIE</b>
09/03/2024			Last Working Day



Teacher Signature

  
HOD Signature

Date	Period	Topics Covered
27-11-2023	IV	Module-1: Introduction to database, characteristics of database approach.
28-11-2023		
28-11-2023	II	Actors on the scene
04-12-2023	IV	Advantages of DBMS approach, Additional implications of using DBMS
07-12-2023	III	History of databases, Overview of database languages and architectures: Data models schemas, instances, 3-schema architecture
14-12-2023	III	Data independence, Database languages and interfaces, Database system environment
18-12-2023	IV	DBMS Architecture & DBMS classification
19-12-2023	II	conceptual data modeling using Entities and Relationships: Entities, Entity type, sets and attributes.
21-12-2023	III	Relationship types, Roles, Structural constraints
22-12-2023	I	Weak Entity type, E-R diagram Example.
01-01-2024	IV	Module-2: Relational Model: Relational model concepts, Relational model constraints
02-01-2024	II	Revision. - For first IA.
08-01-2024	IV	Module 2: Relational Model concepts, characteristics of Relations
11-01-2024	III	Relational Model constraints and Relational database schemas.
16-01-2024	II	Update operations & dealing with constraints violation.

  
.....  
Teacher's Signature

  
.....  
HOD'S Signature

# RECORD OF CLASS WORK

Date	Period	Topics Covered
17-01-2024	<u>VI</u>	Relational algebra: Unary operations
18-01-2024	<u>III</u>	Binary operations, Additional operations
22-01-2024	<u>IV</u>	Aggregate and grouping
23-01-2024	<u>II</u>	Examples of Queries in relational algebra
25-01-2024	<u>III</u>	Module 3: Nested Queries, Aggregate functions
29-01-2024	<u>IV</u>	Grouping, EXISTS and NOT EXISTS
30-01-2024	<u>II</u>	Joins, WITH and CASE constructs
01-02-2024	<u>III</u>	Assertions, triggers
06-02-2024	<u>II</u>	views, schema change statements.
08-02-2024	<u>III</u>	Database application development:
12-02-2024	<u>IV</u>	Accessing database from applications
20-02-2024	<u>II</u>	JDBC, classes and interfaces, SQLJ, Stored Procedures
22-02-2024	<u>III</u>	case study: The internet Bookshop
27-02-2024	<u>II</u>	Module 4: Informal guideline for relation schema
29-02-2024	<u>III</u>	Functional Dependencies, 1 Normal Form, 2NF
04-03-2024	<u>IV</u>	3NF, BCNF, Converting given schema
05-03-2024	<u>II</u>	to BCNF, 4NF, Fifth Normal Form.
05-03-2024	<u>II</u>	Inference rules, Equivalence
06-03-2024	<u>V</u>	Minimal cover, Relational decomposition
06-03-2024	<u>VI</u>	Module 5: Desirable properties of transaction characterizing schedules on recoverability
07-03-2024	<u>III</u>	Transaction support in SQL, concurrency control - Two phase locking techniques

*Aree*

Teacher's Signature

HOD'S Signature







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## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

### Department Advisory Committee Meeting

**Date: 06/02/2024**

**Time: 10.30 AM**

**Venue: Room No. A206**

#### **DAC Members Present:**

Sl. No	Member Name	Designation	Role	Signature
1	Prof. Mallikarjuna G S	HOD	Convenor	
2	Dr. Shalini Prasad	Associate Professor	Co-Convenor	
3	Prof. Shylaja K	Assistant Professor	Member	
4	Dr. Ravindra S	Professor	Member	
5	Prof. Madhavi J Kulkarni	Assistant Professor	Member	
6	Prof. Gopi Kishan J	Assistant Professor	Member	

The Department Advisory Committee meeting was conducted at Department of ECE, on 6<sup>th</sup> February, 2024, from 10:30 am onwards.

#### **Agenda of the Meeting:**

- Certification course for 3<sup>rd</sup> year students
- Conduction of Project Exhibition
- Industrial Visit
- Technical Seminar
- Conduction of guest lectures/ workshops



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## Minutes of Meeting:

In the Department Advisory Committee meeting, an overview of the department was presented by HOD, emphasizing student achievements, result analysis, and faculty accomplishments. The members discussed various suggestions for improvement and reviewed the meeting agenda.

The Committee proposed the following items for inclusion in the agenda:

- Second-year students can be involved in technical activities and encouraged to attend guest lectures or seminars.
- A project exhibition was proposed to give final-year students an opportunity to showcase their projects.
- The Convener also proposed the topics for the technical seminar to be selected from IEEE transaction.
- To increase awareness of current technologies, the committee suggested organizing workshops, guest lectures, and hands-on sessions.

  
Prof. Mallikarjuna G S

**HOD**





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Academic Year: 2023-24 / Even Sem

## DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

### COURSE PREFERNCE

Name of the Faculty: Dr. Ravindra S

Designation: Professor

Sl. No	Course Code and Name	Year/Semester
1	BECL401 - Engineering Electromagnetics	II / 4 <sup>th</sup>
2	BECL404 - Communication lab	II / 4 <sup>th</sup>
3	21EC62 - Microwave antenna	III / 6 <sup>th</sup>
4	18EC821 - Network security	IV / 8 <sup>th</sup>
5	21ECL66 - VLSI lab	III / 6 <sup>th</sup>
6		

  
Signature of faculty



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Academic Year: 2023-24 / Even Sem


## DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

### COURSE PREFERNCE

Name of the Faculty: Dr. Shalini Prasad

Designation: Assoc. Professor

Sl. No	Course Code and Name	Year/Semester
1	BECH02 - Principles of communication systems	II / 4 <sup>th</sup>
2	21EC62 - Microwave & antenna	III / 6 <sup>th</sup>
3	BECL404 Communication lab	II / 4 <sup>th</sup>
4	18EC81 - Wireless & cellular communication	IV / 8 <sup>th</sup>
5		
6		

  
Signature of faculty



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Academic Year: 2023-24 / Even Sem

## DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

### COURSE PREFERNCE

Name of the Faculty: Shylaja K

Designation: Asst. Professor

Sl. No	Course Code and Name	Year/Semester
1	BECL403 - control systems	II / 4 <sup>th</sup>
2	BECL404 - communication lab	II / 4 <sup>th</sup>
3	21EC61 - Technological Innovation Management & Entrepreneurship	III / 6 <sup>th</sup>
4	21ECL66 - VLSI lab	III / 6 <sup>th</sup>
5	21EC821 - Network security	
6		

  
Signature of faculty



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Academic Year: 2023-24 / Even Sem

## DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

### COURSE PREFERNCE

Name of the Faculty: **M a d h a v i J K u l k a r n i**

Designation: Asst. Professor

Sl. No	Course Code and Name	Year/Semester
1	BECL405C - Operating System	II / 4 <sup>th</sup>
2	BECL404 - Communication lab	II / 4 <sup>th</sup>
3	21ECL62 - Microwave & antenna	III / 6 <sup>th</sup>
4	21ECL66 - VLSI lab	III / 6 <sup>th</sup>
5	18ECB1 - Wireless & cellular communication	IV / 8 <sup>th</sup>
6		

  
Signature of faculty



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Academic Year: 2023-24 / Even Sem

## DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

### COURSE PREFERNCE

Name of the Faculty: Vishva Kiran R C

Designation: Asst. Professor

Sl. No	Course Code and Name	Year/Semester
1	BECH05C - Operating System	II / 4 <sup>th</sup>
2	21EC63 - VLSI design & Testing	III / 6 <sup>th</sup>
3	21ECL66 - VLSI lab	III / 6 <sup>th</sup>
4	18ECB21 - Network Security	IV / 8 <sup>th</sup>
5		
6		

  
Signature of faculty



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Academic Year: 2023-24 / Even Sem

## DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

### COURSE PREFERNCE

Name of the Faculty: Gopi Kishan J

Designation: Asst. Professor

Sl. No	Course Code and Name	Year/Semester
1	BECL403- Control system	II / 4 <sup>th</sup>
2	BECL405C- operating system	II / 4 <sup>th</sup>
3	21ECL466 - VLSI lab	III / 6 <sup>th</sup>
4	21EC63 - VLSI design & Testing	III / 6 <sup>th</sup>
5	18EC81 - Wireless & cellular communication	IV / 8 <sup>th</sup>
6		

Signature of faculty



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Academic Year: 2023-24 / Even Sem

## DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

### COURSE PREFERNCE

Name of the Faculty: Latha Shree V

Designation: Asst. Professor

Sl. No	Course Code and Name	Year/Semester
1	BECH05C - operating system	II   4 <sup>th</sup>
2	BECH56B - Programmable logic controller	II   4 <sup>th</sup>
3	BOHK40B - Universal Human values	II   4 <sup>th</sup>
4	21EC63 - VLSI design & Testing	III   6 <sup>th</sup>
5	21ECL66 - VLSI lab	III   6 <sup>th</sup>
6	18EC81 - Wireless & cellular comm	IV   8 <sup>th</sup>

Lathashree-v  
Signature of faculty



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Academic Year: 2023-24 / Even Sem

## DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

### COURSE ALLOCATION

Sl.No	Name of the Faculty	Course Code and Name	Year/ Semester	Signature
1	G.S.Mallikarjuna	BESCK Introduction to Electrical	I/2nd	
2	Dr. Ravindra S	BE401 - Engineering Electromagnetics 2IEC62 - microwave antenna	II/4th III/6th	Ravindra S.
3	Dr. Shalini Prasad	BE402 - PCS 1BEC81 - Wireless & cellular communication	II/4th IV/8th	Shalini Prasad.
4	Shylaja K	2IEC61 - TIM&E 2IEC821 - Network Security BECL404 - commo lab	III/6th IV/8th II/4th	Shylaja K.
5	Madhavi J. K	BE405C - OS 2IEC62 - MW antenna lab	II/4th III/6th	
6	Nishva Kinan R.C	2IEC63 - VLSI design & testing	III/6th	
7	Gopikrishan J	BE403 - control system BESCK204C - Introduction to Electronics	II/4th I/2nd	
8	Latheshree V.	BE456B - PLC BUHK408 - Universal Transceiver Lab BECL404 - commo lab	II/4th II/4th II/4th	Latheshree V.

HOD, ECE





# ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ

(ವಿ ಎ ಯು ಅಧಿನಿಯಮ 1994ರ ಅಡಿಯಲ್ಲಿ ಕರ್ನಾಟಕ ಸರ್ಕಾರದಿಂದ ಸ್ಥಾಪಿತವಾದ ರಾಜ್ಯ ವಿಶ್ವವಿದ್ಯಾಲಯ)

## VISVESVARAYA TECHNOLOGICAL UNIVERSITY

(State University of Government of Karnataka Established as per the VTU Act, 1994)

Phone : 0831-2498100 / 240546

Fax : 0831-2405467

Email : registrar@vtu.ac.in

Web : https://vtu.ac.in

Reference: VTU/BGM/AC /2023-24/6085

Dated: 2 FEB 2024

### NOTIFICATION

**Subject:** Tentative Academic Calendar of VIII semester B.E./B.Tech./B.Arch/B.Plan programs regarding...

**Reference:** Dean Faculty of Engineering Approval Dated: 14.01.2024  
The Hon'ble Vice Chancellor's approval dated: 14.01.2024

The Tentative academic calendar concerned to VIII semesters' of B.E./B.Tech./B.Arch/B.Plan programs for the academic year 2023-24 is hereby notified as follows;

	VIII semester B.E./B.Tech.,	VIII semester B. Plan	VIII semester B.Arch.
Commencement of the Semester	12.02.2024	26.02.2024	01.02.2024
Commencement of Classes	12.02.2024	26.02.2024	01.02.2024
Last Working Day of the Semester	11.05.2024	25.05.2024	25.05.2024
Practical Examination	-----	-----	27.05.2024 To 01.06.2024
Theory Examinations	13.05.2024 To 21.05.2024	03.06.2024 To 12.06.2024	03.06.2024 To 27.06.2024
Internship/Practical Exam for Lateral Entry Students	----	----	----
Internship Viva Voce/ Project viva	23.05.2024 To 30.05.2024	----	----
Commencement of NEXT Semester	----	----	----

#### Please Note:

- The academic sessions for semesters should commence on the **date mentioned above**



## CITY ENGINEERING COLLEGE, BENGALURU-560061. ACADEMIC CALENDAR 2023-24 (EVEN SEM)

## DEPT OF E&amp;CE

DAY	FEB 2024		MARCH 2024		APRIL 2024		MAY 2024		JUNE 2024		JULY 2024		AUGUST 2024	
	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT
MON					1	1 <sup>st</sup> to 25 <sup>th</sup> April 24 – Theory Examination – Vth Sem					1	1 <sup>st</sup> to 11 <sup>th</sup> July 24 Practical Exam II Sem B. E		
TUE					2						2	2 <sup>nd</sup> to 4 <sup>th</sup> July 24 Test I – IV Sem B. E		
WED					3		1	Holiday – May Day		VI Sem - Display of Ist IA Marks on NB and ERP Communication to parents	3	3 <sup>rd</sup> to 5 <sup>th</sup> July 24, II Test for VI Semester		
THU	1				4		2	Sports Day			4		1	
FRI	2				5		3	Sports Day			5		2	
SAT	3	1st Saturday Holiday	2	1st Saturday Holiday	6	1st Saturday Holiday	4	1st Saturday Holiday	1	1st Saturday Holiday	6	1st Saturday Holiday	3	1st Saturday Holiday
SUN	4		3		7		5		2		7		4	
MON	5		4		8		6		3	3 <sup>rd</sup> June to 20 <sup>th</sup> June 2024 Theory Examination of I Sem MBA/MCA/M. Tech	8		5	
TUE	6		5	5 <sup>th</sup> , 6 <sup>th</sup> , 7 <sup>th</sup> Mar 24 Test 2- III Sem, Test 3-V SEM	9	Holiday – Chandramana Ugadi	7	7 <sup>th</sup> May 24, 3 <sup>rd</sup> Test VIII Semester B. E	4		9		6	
WED	7		6	Commencement of Classes of II Sem B. E	10		8	Ethnic Day	5		10	IV Semester - Display of Ist Test IA Marks on NB and ERP Communication to parents	7	
THU	8		7		11	Holiday – Qutub-e-Ramzan	9	College Day	6		11	VI Sem - Display of 2 <sup>nd</sup> IA Marks on NB and ERP Communication to parents	8	
FRI	9		8	Holiday -Maha Shiva Ratri	12		10	Holiday – Basava Jayanthi	7		12		9	
SAT	10		9	Last Working Day of classes III Sem B. E	13	Alumni Meet	11	Last Working Day of the Semester VIII Sem B. E And Farewell for VIII Semester Students	8	INDUSTRIAL VISIT	13		10	
SUN	11		10		14		12		9		14		11	
MON	12	Commencement of Classes of I Sem MBA/MCA/M.Tech and VIII Sem B. E	11		15		13	13 <sup>th</sup> to 21 <sup>st</sup> May 24 Theory Examinations – VIII Sem B.E	10		15	15 <sup>th</sup> July to 10 <sup>th</sup> Aug 24- Theory Exam- II Sem B. E	12	
TUE	13	Industrial Visit – 8 <sup>th</sup> Sem (CS/IS/AI ML), B.E	12		16	16 <sup>th</sup> to 18 <sup>th</sup> April 24, I-Test IInd Semester	14	GUEST LECTURE 1	11		16		13	
WED	14		13	13 <sup>th</sup> to 27 <sup>th</sup> Mar 24 Theory Examination -III Sem B. E	17		15		12		17	Holiday - Muharram	14	
THU	15		14		18		16		13		18		15	Holiday – Independence Day
FRI	16		15		19	MBA/MCA/M.Tech Industrial Visit	17		14		19		16	
SAT	17	3rd Saturday Holiday	16	3rd Saturday Holiday Last Working Day of classes V Sem B. E	20	3rd Saturday Holiday	18	3rd Saturday Holiday	15	3rd Saturday Holiday	20	3rd Saturday Holiday	17	3rd Saturday Holiday
SUN	18		17		21		19		16		21		18	
MON	19	Industrial Visit – 5 <sup>th</sup> Sem (CS/IS/AI ML), B. E	18		22		20	Commencement of classes of IV Sem B. E	17	Holiday - Bakrid	22		19	Commencement of Classes III Sem B. E
TUE	20		19		23		21	III Test MBA/MCA/M.Tech	18	18 <sup>th</sup> to 20 <sup>th</sup> June 24, II-Test IInd Semester	23		20	20 <sup>th</sup> to 22 <sup>nd</sup> Aug 24 Test II – IV Sem B. E
WED	21		20	20 <sup>th</sup> to 30 <sup>th</sup> Mar 24 Practical Examination – Vth Sem B. E	24	Display of Ist Test IA Marks on NB and ERP Communication to parents	22		19	GUEST LECTURE 2	24		21	
THU	22		21		25	25 <sup>th</sup> to 27 <sup>th</sup> April 24, II Test MBA/MCA/M.Tech and 25 <sup>th</sup> April VIII Semester B. E	23	23 <sup>rd</sup> to 30 <sup>th</sup> May 24, Internship Viva-voce/Project Viva- VIII Semester	20		25		22	
FRI	23	23 <sup>rd</sup> Feb to 5 <sup>th</sup> Mar 2024 Practical Exam B.E I Sem B. E	22		26	"Battle of Science" for IInd Sem Students	24		21		26		23	
SAT	24		23	"Talents Day" for IInd Sem Students	27		25	Last Working Day of I Sem MBA/MCA/M. Tech	22	Graduation Day	27		24	
SUN	25		24		28		26		23		28		25	
MON	26		25	25 <sup>th</sup> to 27 <sup>th</sup> March 24, I Test MBA/MCA/M.Tech and 25 <sup>th</sup> March VIII Semester B. E	29	Commencement of Classes of VI Semester B. E	27	27 <sup>th</sup> to 31 <sup>st</sup> May 24 Practical Examination/Internship Viva Voce/Project Viva of I Sem MCA/ M. Tech	24		29		26	Display of 2 <sup>nd</sup> Test IA Marks on NB and ERP Communication to parents
TUE	27		26		30		28	28 <sup>th</sup> to 30 <sup>th</sup> MAY 24, I Test for VI Semester	25	Commencement of Classes of II Sem MBA/MCA/M.Tech	30	International Conference	27	
WED	28		27				29		26	Display of IInd IA Marks on NB and ERP Communication to parents	31	International Conference	28	
THU	29		28				30		27				29	
FRI			29	Holiday – Good Friday			31		28	PTM – IInd Semester			30	PTM – IVth Semester
SAT			30	30 <sup>th</sup> Mar to 12 <sup>th</sup> April 24, Practical Examination – III Sem B. E		<i>P.S. Mahalingam</i>			29	Last Working Day of The II Semester B. E		<i>S. K. Srinivas</i> PRINCIPAL CITY ENGINEERING COLLEGE BENGALURU-560061	31	Last Working Day of the semester IV Semester
SUN			31						30					

Note: 1. Students Feedback should be taken immediately after the Test. 2. There will be no additional circular will be sent for dates mentioned for Events in CoE



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SEMESTER: IV EC 'A' SEC CBCS

2022 SCHEME

CLASS ROOM: A106

DAY	1	2	TEA	3	4	LUNCH	5	6	7	
	9:30 AM 10:20 AM	10:20AM 11:10 AM	11:10 AM 11:30 AM	11:30 AM 12:20 PM	12:20 PM 1:10 PM	1:10 PM 2:00 PM	2:00 PM 2:50 PM	2:50 PM 3:40 PM	3:40 PM 4:00 PM	
MON	BEC403	BEC456B	B R E A K	BEC405C	LIBRARY	L U N C H	BEC402 A1			
								BEC403 A2		
								BECL404 A3		
TUE	BEC401	BEC402			BBOK407		BBOK407	TUT		
								BEC403		A1
WED	BEC402	UHV			BEC405C		LIBRARY	BECL404 A2		
								BEC402 A3		
THU	BEC405C	BEC402			BEC403		BEC401	BBOK407	ACTIVITY	
				BECL404 A1		DEPARTMENT ACTIVITY				
FRI	BEC401	BEC403		BEC402 A2						
				BEC403 A3						
SAT	NSS/SPORTS/YOGA BNSK359/BPEK359/BYOK359			NSS/SPORTS/YOGA BNSK359/BPEK359/BYOK359						

SUBJECT CODE	SUBJECT NAME	SUBJECT HANDELED
BEC401	Engineering Electromagnetics	Dr. RAVINDRA. S
BEC402	Principles of Communication Systems	A1 Dr. SHALINI PRASAD
		A2
		A3 IPCC - Dr. SHALINI PRASAD
BEC403	Control System	A1 Prof. GOPIKISHAN J
		A2
		A3 IPCC - Prof. GOPIKISHAN J
BECL404	Communication lab	A1 Prof. SHYLAJA K
		A2 Prof. LATHASHREE
		A3
BEC405C	Operating System	Prof. MADHAVI J KULKARNI
BEC456B	Programmable Logic Controllers	Prof. LATHASHREE
BBOK407	Biology	Prof. MEGHANA
BUHK408	Universal Human Values (UHV)	
BNSK459/BPEK459/ BYOK459	NSS/SPORTS/YOGA	

TT COORDINATOR

HOD, ECE

PRINCIPAL  
CITY ENGINEERING COLLEGE  
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SEMESTER: VI EC 'A' SEC CBCS  
CLASS ROOM: A105

2021 SCHEME

DAY	1	2	TEA	3	4	LUNCH	5	6	7
	9:30 AM 10:20 AM	10:20AM 11:10 AM	11:10 AM 11:30 AM	11:30 AM 12:20 PM	12:20 PM 1:10 PM	1:10 PM 2:00 PM	2:00 PM 2:50 PM	2:50 PM 3:40 PM	3:40 PM 4:00 PM
MON	21EC62	21EC644	B R E A K	21CV654	LIBRARY	L U N C H			
TUE	21CV654	21EC644		21EC62	LIBRARY		21EC62	-	
WED	21EC644	21EC62(T)		21EC63	LIBRARY		21ECL66	-	
THU	21EC63	21CV654		21EC61	21EC61(T)		21ECL66	-	
FRI	21EC61	21EC61		21EC63	LIBRARY		21EC62	-	
SAT	NSS/SPORTS/YOGA			NSS/SPORTS/YOGA			DEPARTMENT ACTIVITY		

SUBJECT CODE	SUBJECT NAME	SUBJECT HANDELED
21EC61	TIME	Prof. SHYLAJA K
21EC62	MWA	Dr. RAVINDRA. S
	MWTA	Prof. MADHAVI J KULKARNI
21EC63	VISI Design & Testing	Prof. VISHVAKIRAN R C
21EC644	Micro Electro Mechanical Systems	Prof. MADHAVI J KULKARNI
21CV654	Conservation of Natural Resources	Prof. VINAY (CIVIL)
21ECL66	VLSI LAB	Prof. VISHVAKIRAN R C
21ECMP67	MINI Project	Prof. G.S.
		MALLIKARJUNA
		Dr. SHALINI PRASAD
		Prof. SHYLAJA K
		Dr. RAVINDRA. S
		Prof. MADHAVI J KULKARNI
	Prof. VISHVAKIRAN R C	
	Prof. GOPIKISHAN J	

  
TT COORDINATOR

  
HOD, ECE

  
PRINCIPAL  
CITY ENGINEERING COLLEGE  
Kanakapura Main Road, BANGALORE - 560 062



# CITY ENGINEERING COLLEGE

Approved by AICTE New Delhi & Affiliated by VTU, Belagavi Doddakallasandra, Off  
Kanakapura Main Road,  
Next to Gokulam Apartment, Bangalore - 560 062.




SEMESTER: VIII EC 'A' SEC CBCS  
CLASS ROOM: A104

2018 SCHEME

DAY	1	2	TEA	3	4	LUNCH	5	6	7
	9:30 AM 10:20 AM	10:20AM 11:10 AM	11:10 AM 11:25 AM AM	11:25 AM 12:15 PM	12:15 PM 1:05 PM	1:05 PM 2:00 PM	2:00 PM 2:50 PM	2:50 PM 3:40 PM	3:40 PM 4:30 PM
MON	18EC821	18EC81	B R E A K	18EC821	LIBRARY	L U N C H	MENTOR AND MENTEE INTERACTION		
TUE	18EC81	18EC821		18EC81	LIBRARY		ACTIVITY		
WED	18ECP83/18ECI85			18ECP83/18ECI85			18ECP83/18ECI85		
THU									
FRI									
SAT	18ECS84			18ECS84					

SUBJECT CODE	SUBJECT NAME	SUBJECT HANDELED
18EC81	Wireless and Cellular Communication	Dr. SHALINI PRASAD
18EC821	Network Security	Prof. SHYLAJA K
18ECP83	PROJECT WORK PHASE II	Dr. SHALINI PRASAD AND . Dr. RAVINDRA. S
18ECS84	SEMINAR	Prof. MADHAVI J KULKARNI
18ECI85	INTERSHIP	Prof. SHYLAJA K

  
TT COORDINATOR

  
HOD, ECE

  
PRINCIPAL  
CITY ENGINEERING COLLEGE  
Kanakapura Main Road, BANGALORE - 560 061



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Kanakapura Main Road,  
Next to Gokulam Apartment, Bangalore - 560 062.



SEMESTER: VIII

PROF. Shylaja K

DAY	1	2	TEA	3	4	LUNCH	5	6	7	
	9:30 AM 10:20 AM	10:20AM 11:10 AM	11:10 AM 11:30 AM	11:30 AM 12:20 PM	12:20 PM 1:10 PM	1:10 PM 2:00 PM	2:00 PM 2:50 PM	2:50 PM 3:40 PM	3:40 PM 4:30 PM	
MON	18EC821		B R E A K	18EC821		L U N C H				
TUE		18EC821								
WED										
THU										
FRI										
SAT										

TT COORDINATOR

HOD, ECE

PRINCIPAL  
CITY ENGINEERING COLLEGE  
Kanakapura Main Road, BANGALORE - 560 062

Year : 2023 - 2024





Semester : Odd / Even ✓

Name of the Teacher : ..... Shylaja K .....

Designation : ..... AP .....

Department : ..... ECE .....

Sem/Branch	Subject Code	Subject
1. VI / ECE	21EC61	TIME
2. VIII / ECE	18EC821	Network Security
3. ....	.....	.....

	Initials at the End of the			
	1st Month	2nd Month	3rd Month	Semester
Staff	Shylaja K	Shylaja K	Shylaja K	Shylaja K
HOD	R	R	R	R
Principal	 PRINCIPAL CITY ENGINEERING COLLEGE Katakabura Main Road, BANGALORE - 560 081	 PRINCIPAL CITY ENGINEERING COLLEGE Katakabura Main Road, BANGALORE - 560 081	 PRINCIPAL CITY ENGINEERING COLLEGE Katakabura Main Road, BANGALORE - 560 081	 PRINCIPAL CITY ENGINEERING COLLEGE Katakabura Main Road, BANGALORE - 560 081

# NETWORK SECURITY

Course Code	: 18EC821	CIE Marks	: 40
Lecture Hours/Week	: 3	SEE Marks	: 60
Total Number of Lecture Hours	: 40 (08 Hrs / Module)	Exam Hours	: 03
CREDITS – 03			

**Course Learning Objectives:** This course will enable students to:

- Describe network security services and mechanisms.
- Understand Transport Level Security and Secure Socket Layer
- Know about Security concerns in Internet Protocol security
- Discuss about Intruders, Intrusion detection and Malicious Software
- Discuss about Firewalls, Firewall characteristics, Biasing and Configuration

## Module-1

Attacks on Computers and Computer Security: Need for Security, Security Approaches, Principles of Security Types of Attacks.

**(Chapter1-Text2)**

**L1, L2**

## Module-2

Transport Level Security: Web Security Considerations, Secure Sockets Layer, Transport Layer Security, HTTPS, Secure Shell (SSH)

**(Chapter15- Text1)**

**L1,L2**

## Module-3

IP Security: Overview of IP Security (IPSec), IP Security Architecture, Modes of Operation, Security Associations (SA), Authentication Header (AH), Encapsulating Security Payload (ESP), Internet Key Exchange.

**(Chapter19-Text1)**

**L1,L2**

## Module-4

Intruders, Intrusion Detection. **(Chapter20-Text1)**

**MALICIOUS SOFTWARE:** Viruses and Related Threats, Virus Counter measures,

**(Chapter21-Text1)**

**L1,L2**

## Module-5

Firewalls: The Need for firewalls, Firewall Characteristics, Types of Firewalls, Firewall Biasing, Firewall location and configuration

**(Chapter22-Text 1)**

**L1, L2**



**Course Outcomes:** After studying this course, students will be able to:

1. Explain network security services and mechanisms and explain security concepts
2. Understand the concept of Transport Level Security and Secure Socket Layer.
3. Explain Security concerns in Internet Protocol security
4. Explain Intruders, Intrusion detection and Malicious Software
5. Describe Firewalls, Firewall Characteristics, Biasing and Configuration

**Question paper pattern:**

- Examination will be conducted for 100 marks with question paper containing 10 full questions, each of 20 marks.
- Each full question can have a maximum of 4 sub questions.
- There will be 2 full questions from each module covering all the topics of the module.
- Students will have to answer 5 full questions, selecting one full question from each module.
- The total marks will be proportionally reduced to 60 marks as SEE marks is 60.

**TEXT BOOKS:**

1. Cryptography and Network Security Principles and Practice , Pearson Education Inc., William Stallings, 5<sup>th</sup> Edition, 2014, ISBN: 978-81-317- 6166-3.
2. Cryptography and Network Security, Atul Kahate, TMH, 2003.

**REFERENCE BOOKS:**

1. Cryptography and Network Security, Behrouz A. Forouzan, TMH, 2007.

*G.S. Malikani*

# CITY ENGINEERING COLLEGE

Doddakalsandra, Off kanakapura road, Bangalore 560 061.

<b>Course Title:</b>	<b>Course Code: 18EC821</b>
<b>CIE Marks: 40</b>	<b>SEE Marks: 60</b>
<b>Semester: VIII</b>	<b>Academic year: 2023-24</b>
<b>Course Incharge: SHYLAJA.K</b>	<b>Date: 12/2/2024</b>

## Course Learning Objectives:

This course will enable students to:

1. Describe network security services and mechanisms.
2. Understand Transport layer security and Secure socket Layer.
3. Know about security concerns in Internet Protocol security.
4. Discuss about Intruders, Intrusion detection and malicious Software.
5. Discuss about firewalls. Firewalls characteristics, Basing and configuration.

Week	Module	Topic	Sub Topic	BTL's	CO's
1	1	Attacks on computer and computer network	Introduction	L1, L2	CO1
			Need for security		
			Security approaches		
2			Principles of security		CO1
			Types of attack		
	Types of attack				
3	2	Transport Level security	Web security considerations		CO2
			Secure socket layer		
			Secure socket layer		
			Transport layer security		CO2

<b>4</b>			<b>Transport layer security</b>				
			<b>HTTPS</b>				
			<b>SSH</b>				
			<b>SSH</b>				
<b>5</b>	<b>3</b>	<b>IP security</b>	<b>overview</b>		<b>C03</b>		
			<b>IP sec architecture</b>				
			<b>IP sec architecture</b>				
			<b>Modes of operation</b>				
<b>6</b>						<b>Security associations</b>	<b>C03</b>
						<b>Security Associations</b>	
						<b>Authentication header</b>	
						<b>ESP</b>	<b>C03</b>
<b>7</b>			<b>Internet Key Exchange</b>				
			<b>Internet Key Exchange</b>				
<b>8</b>	<b>4</b>	<b>Intruders</b>	<b>Introduction</b>		<b>C04</b>		
			<b>Intruder detection</b>				
			<b>Intruder detection</b>				
			<b>Intruder detection</b>				
<b>9</b>		<b>Malicious software</b>	<b>Virus and related threats</b>		<b>C04</b>		
			<b>Virus counter measures</b>				
			<b>Virus counter measures</b>				
<b>10</b>	<b>5</b>	<b>Firewalls</b>	<b>Introduction</b>		<b>C05</b>		
			<b>Need for firewalls</b>				
			<b>Goals, Characteristics, capabilities and Limitations</b>				
<b>11</b>						<b>Types of Firewalls</b>	<b>C05</b>
						<b>Types of Firewalls</b>	
						<b>Firewall basing</b>	<b>C05</b>
<b>12</b>						<b>Firewall basing</b>	
						<b>Firewall location and configuration</b>	
<b>12</b>			<b>Firewall location and configuration</b>				
<b>13</b>			<b>Revision</b>				

**Course Outcomes:** After studying this course, students will be able to:

1. Explain network security services and mechanisms and explain security concepts
2. Understand the concept of Transport Level Security and Secure Socket Layer.
3. Explain Security concerns in Internet Protocol security
4. Explain Intruders, Intrusion detection and Malicious Software
5. Describe Firewalls, Firewall Characteristics, Biasing and Configuration

**Question paper pattern:**

- Examination will be conducted for 100 marks with question paper containing 10 full questions, each of 20 marks.
- Each full question can have a maximum of 4 sub questions.
- There will be 2 full questions from each module covering all the topics of the module.
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- The total marks will be proportionally reduced to 60 marks as SEE marks is 60.

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*C.S. Malhotra*



## **CITY ENGINEERING COLLEGE**

### **Dept of Electronics and Communication Engineering**

#### **Question Bank / Assignment (AY-2023-24)**

**Sem:8<sup>th</sup> ECE**

**Sub: *NETWORK SECURITY***

**Code:18EC821**

#### **MODULE:1 (Attacks on Computer and Computer Security)**

1. What is the security is needed? Brief.
2. Enumerate the salient features of modern nature of attacks.
3. List the key aspects of a good security management practices.
4. Explain the principles of security with necessary diagrams.
5. How does a common man understand types of attacks? Explain.
6. Explain, Interception, Fabrication, Modification and Interruption in brief.
7. What are Passive attacks? Explain Release of message contents and Traffic analysis.
8. What are Active attacks? Explain Masquerade, Replay attack, Alteration of messages and Denial of service.
9. Mention the programs that attack computer systems. Explain Virus and its four phases of lifetime.
10. Write short notes on Worm, Trojan horse, Cookies and Java scripts.
11. Highlight the key characteristics of the four generations of anti-virus software.
12. Define sniffing and spoofing, Phishing and Pharming.

## **MODULE:2 (TRANSPORT LEVEL SECURITY)**

1. List the web security considerations.
2. Tabulate the Threats, consequences and countermeasures with respect to Integrity confidentiality Denial of service and Authentication.
3. Explain with neat figures, the three level web traffic security approaches.
4. Describe SSL architecture with SSL protocol stack.
5. Explain SSL Record protocol operation with a neat figure along with SSL record format.
6. What are change cipher spec protocol and Alert protocols? List the Alerts that are always fatal.
7. What are the four phases of initial exchange needed to establish a logical connection between client and server? Explain with a neat figure.
8. What do you understand by TLS? Brief about version number, message authentication code and Pseudorandom function.
9. List the Alert codes supported by TLS.
10. Write short notes on HTTPS.
11. Write the SSH protocol stack and explain in brief.
12. Explain SSH Transport Layer Protocol Packet formation and the sequence of events in SSH Transport Layer Protocol.
13. Explain user Authentication Protocol.
14. Explain SSH connection Protocol Message Exchange with a figure.
15. Explain Port forwarding and Remote forwarding with necessary figures.

### **MODULE:3 (IP SECURITY)**

1. Enumerate the applications of IP security.
2. What are the benefits of IP Sec.
3. Explain how IPSec documents are categorized.
4. List IP Sec services.
5. Explain Transport and Tunnel mode of operation.
6. Explain Transport and Tunnel mode ESP.
7. What is a Security Association? What are the three parameters by which a security association is identified.
8. Explain SAD and SPD in detail.
9. Explain processing model for outbound and inbound packets.
10. Explain AH in detail.
11. Explain ESP in detail.
12. What is padding and antireplay mechanism?
13. What are the features of IKE key determination?
14. Explain IKE payload and header formats.
15. Brief Payload types defined for IKE.

#### **MODULE:4 (INTRUDERS, MALICIOUS SOFTWARE)**

1. Define Masquerader, Misfeasor and Clandestine user. Give Examples of Intrusion.
2. Explain in detail, the three broad classes of Intruder behavior Patterns.
3. What are the two ways in which a password file can be protected? List the techniques for learning passwords.
4. Mention two principal countermeasures for Intruders. Explain the different considerations in Intrusion detection.
5. Brief about the approaches to Intrusion detection.
6. Write short notes on Audit Records.
7. What are Threshold detection and Profile-based anomaly detection? Explain the metrics that are useful for profile-based intrusion detection.
8. Explain Rule-based Intrusion detection.
9. Draw the architecture of Distributed Intrusion Detection along with Agent architecture and explain. What are the major issues in the design of Distributed Intrusion Detection system.
10. What are Honey pots? List the features of it.
11. What is Malicious Software? Explain the nature of Viruses.
12. Briefly explain the four phases of Virus lifetime.
13. Write short notes on Virus structure.
14. How virus can be classified by target and concealment strategy?
15. What are Macro viruses and e-mail viruses?
16. Explain in detail the virus countermeasures.
17. Explain Digital Immune System with a neat figure.



## **MODULE: 5 FIREWALLS**

1. Brief about the range of characteristics that a firewall access policy could use to filter traffic.
2. List the design goals for a firewall.
3. Briefly explain the capabilities one can expect from a firewall.
4. Explain with neat figures the types of firewalls.
5. What are the common characteristics of a Bastion Host?
6. Explain the advantages of a software module which can be used to secure an individual host.
7. Write short notes on Personal Firewall.
8. Explain DMZ networks in detail with a figure.
9. Explain Distributed Firewall configuration.
10. Brief about the virtual Private Networks.

**CITY ENGINEERING COLLEGE**  
**FIRST INTERNAL TEST**

Programme: ELECTRONICS AND COMMUNICATION

Course : Network Security

Sem& Sec: 8 A

Duration: 1 ½ hrs.



Date:26/03/2024

Time: 2:30 PM-4:00 PM

Max Marks: 40

*Note: Answer all Questions selecting any ONE FULL question from each part.*

Q No	Questions	Marks	CO's	BT'S
<b>PART-A</b>				
1	Why a security is needed? Brief. Enumerate the salient features of modern nature of attacks.	10	CO1	L1, L2
<b>OR</b>				
2	Explain the principles of security with necessary diagrams.	10	CO1	L1, L2
<b>PART-B</b>				
3	What are Active attacks? Explain Masquerade, Replay attack, Alteration of messages and Denial of service.	10	CO1	L1, L2
<b>OR</b>				
4	Mention the programs that attack computer systems. Explain Virus and its four phases of lifetime.	10	CO1	L1, L2
<b>PART-C</b>				
5	Highlight the key characteristics of the four generations of anti-virus software.	10	CO1	L1, L2
<b>OR</b>				
6	Tabulate the Web Security Threats, consequences and countermeasures with respect to Integrity, confidentiality, Denial of service and Authentication.	10	CO2	L1, L2
<b>PART-D</b>				
7	Explain with neat figures, the three-level web traffic security approaches.	10	CO2	L1, L2
<b>OR</b>				
8	Describe SSL architecture with SSL protocol stack.	10	CO2	L1, L2

Blooms Taxonomy Levels (BTL): BT1-Remembering BT2- Understanding

Course Outcomes (CO's): CO1: Explain network security services and mechanisms and explain Security concepts

CO2: Understand the concept of transport level security and SSL.



**CITY ENGINEERING COLLEGE**  
**DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING**  
**SCHEME FOR VALUATION- 2023-24**

INTERNAL TEST: 01

Semester & Section: 

8	A
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 Sub Code: 

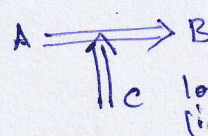
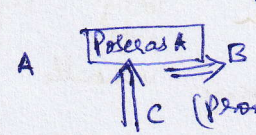
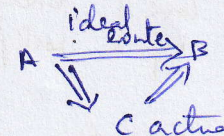
18EC821
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 Sub Name: 


Network Security
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 Date: 

26-3-24
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Question No.	Details of the Answer	Marks Distribution	Total Marks
1.	<p>Need of Security</p> <ul style="list-style-type: none"> <li>- Importance of data</li> <li>- To handle or cover financial &amp; personal data</li> <li>- To authenticate a user.</li> <li>- To encode database info.</li> <li>- To avoid intruder capturing the data</li> </ul> <p>Salient features of modern nature of attacks:</p> <ul style="list-style-type: none"> <li>- Automating attacks</li> <li>- Privacy concerns</li> <li>- Distance no matter</li> </ul>	5      5	10
2.	<p>Principles of security - confidentiality, Authentication, Integrity &amp; Non-repudiation.</p> <p>Confidentiality - </p> <p>Authentication: </p> <p>Integrity: </p> <p>Non-repudiation - Refusal of info. sent. (denial of doing)</p>	3  3  3  1	10
3	<p>Active attacks are modifying the original message or creation of false message. Not an easy way to prevent.</p> <p>Masquerade - Trying to pose as another entity.</p> <p>Replay attack - Modification &amp; resending</p> <p>Alteration of messages - changes to original data</p> <p>Denial of service - Attempt to prevent legitimate use from accessing services.</p>	1  3  3  3	10

Staff S/Sy. K

  
HOD

Question No.	Details of the Answer	Marks Distribution	Total Marks
4.	<p>Programs that attack computers - Virus, Worm, Trojan horse, Applets &amp; ActiveX controls, Cookies, Javascript, VB script &amp; Jscript.</p> <p>Four phases of Virus lifetime - (i) Dormant phase Virus is idle.</p> <p>(ii) Propagation phase - Virus copies itself &amp; each copy creates more copies of self thus propagating the virus.</p> <p>(iii) Triggering phase - when an event is triggered or initiated.</p> <p>(iv) Execution phase - destructive in nature</p>	<p>2</p> <p>2x4</p>	<p>10</p>
5.	<p>Key characteristics of 4 generations of anti-virus software -</p> <p>(i) Single scanners - rely on virus sign (ii) Do not rely on virus sign, use heuristic rules (iii) Memory resident (iv) Access control features</p>		<p>10</p>
6.	<p>Web security threats</p> <p>integrity - Modification of user data - Modification of message</p> <p>Confidentiality - Eavesdropping on the net Theft of info from server</p> <p>DOS - Flooding w/c with bogus requests</p> <p>Authentication - Data forging Impersonation of legitimate users</p> <p>loss of info vulnerable</p> <p>loss of info Encryption web browser</p> <p>Disruptive Annoying Difficult to prevent</p> <p>Mix represent of user belief that false info is valid. crypts technique</p>		<p>10</p>

Question No.	Details of the Answer	Marks Distribution	Total Marks																																	
7	<p>web traffic security approaches :</p> <table border="1"> <tr> <td>HTTP</td> <td>FTP</td> <td>SMTP</td> </tr> <tr> <td colspan="3">TCP</td> </tr> <tr> <td>IP</td> <td colspan="2">IPsec</td> </tr> </table> <p>N/w level</p> <table border="1"> <tr> <td>HTTP</td> <td>FTP</td> <td>SMTP</td> </tr> <tr> <td colspan="3">SSL or TLS</td> </tr> <tr> <td colspan="3">TCP</td> </tr> <tr> <td colspan="3">IP</td> </tr> </table> <p>Transport level</p> <table border="1"> <tr> <td></td> <td>SMIME</td> <td></td> </tr> <tr> <td>Kerberos</td> <td>SMTP</td> <td>HTTP</td> </tr> <tr> <td>UDP</td> <td colspan="2">TCP</td> </tr> <tr> <td></td> <td colspan="2">IP</td> </tr> </table> <p>Application level</p>	HTTP	FTP	SMTP	TCP			IP	IPsec		HTTP	FTP	SMTP	SSL or TLS			TCP			IP				SMIME		Kerberos	SMTP	HTTP	UDP	TCP			IP		<p>level 4                      &amp; 6                      Expln 6</p>	<p>10</p>
HTTP	FTP	SMTP																																		
TCP																																				
IP	IPsec																																			
HTTP	FTP	SMTP																																		
SSL or TLS																																				
TCP																																				
IP																																				
	SMIME																																			
Kerberos	SMTP	HTTP																																		
UDP	TCP																																			
	IP																																			
8	<p>Secure socket layer architecture.                      SSL protocol stack explanation</p>	<p>3                      3                      4</p>	<p>10</p>																																	

Staff

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 HOD

**CITY ENGINEERING COLLEGE**  
**SECOND INTERNAL TEST**

Programme: **ELECTRONICS AND COMMUNICATION**

Date: **25/04/2024**

Course : **Network Security**

Time: **2:30 PM-4:00 PM**

Sem & Sec: **8 A**

Max Marks: **40**

Duration: **1 ½ hrs.**

*Note: Answer all Questions selecting any ONE FULL question from each part.*

Q No	Questions	Marks	CO's	BT'S
<b>PART-A</b>				
1	Enumerate the applications of IP security and the benefits of IP Sec.	10	CO3	L1, L2
<b>OR</b>				
2	Explain how IPSec documents are categorized and List IP Sec services.	10	CO3	L1, L2
<b>PART-B</b>				
3	Explain Transport and Tunnel mode ESP.	10	CO3	L1, L2
<b>OR</b>				
4	Explain SAD and SPD in detail.	10	CO3	L1, L2
<b>PART-C</b>				
5	Explain processing model for outbound and inbound packets.	10	CO3	L1, L2
<b>OR</b>				
6	Explain AH in detail.	10	CO3	L1, L2
<b>PART-D</b>				
7a	What is padding and antireplay mechanism?	05	CO3	L1, L2
b	What are the features of IKE key determination?	05		
<b>OR</b>				
8	Explain IKE payload and header formats.	10	CO3	L1, L2

Blooms Taxonomy Levels (BTL): *BT1-Remembering BT2- Understanding*

Course Outcomes (CO's): CO3: Security concerns in Internet Protocol security



Question No.	Details of the Answer	Marks Distribution	Total Marks
3.	<p>IPsec services -</p> <ul style="list-style-type: none"> <li>- Access control</li> <li>- ensure connectionless integrity</li> <li>- Data Origin Authentication</li> <li>- Rejection of replayed packets</li> <li>- confidentiality</li> <li>- limited traffic flows confidentially</li> </ul> <p>Modes of operation:</p> <p>a) <u>Transport mode</u> - provide protection for upper layer protocols.</p> <ul style="list-style-type: none"> <li>- used for end-to-end comm <u>betn</u> two hosts</li> <li>- over IPv4, payload is data which follows header.</li> <li>- for IPv6, payload is data which follows both the IP header &amp; extension header.</li> <li>- ESP encrypts &amp; authenticates IP payload but not the header.</li> <li>- AH authenticates IP payload &amp; selected portion of IP header.</li> </ul> <p>b) <u>Tunnel mode</u> - provides protection to entire IP packet.</p> <ul style="list-style-type: none"> <li>- AH or ESP fields are added to IP packet.</li> <li>- original packet travels thru tunnel from one pt of IP n/w to another, no routes.</li> <li>- Diff source &amp; dest's addr.</li> <li>- ESP encrypts &amp; authenticates entire IP packet &amp; selected portion of outer IP header.</li> <li>- AH authenticates entire inner IP packet &amp; selected portion of outer IP header.</li> </ul> <p>Original IP packet: IP H   TCP H   Data</p> <p>Tunnel mode packet: IP H   IPsec H   TCP H   Data</p> <p>Tunnel mode packet: <u>Outer IP</u>   IPsec H   <u>protected IP H</u>   TCP H   Data</p>	4	10
		5+5	10

Staff *[Signature]*

*[Signature]*  
HOD



Question No.	Details of the Answer	Marks Distribution	Total Marks
4	<p>Security association Database:</p> <ul style="list-style-type: none"> <li>- parameters in SAD entry - SPI (32)</li> <li>- SNC (32)</li> <li>- SCO (flag)</li> <li>- ARN</li> <li>- AH info</li> <li>- ESP info.</li> </ul> <p>- Life time of SA</p> <p>- IPsec Protocol mode</p> <p>- Path MTU</p> <p>SPD - defined by a set of IP &amp; upper layer protocol field values called <u>selectors</u> which filter outgoing traffic in order to map it into a particular SA.</p> <p>selectors - Remote IP addr</p> <ul style="list-style-type: none"> <li>- local IP addr</li> <li>- Next layer proto</li> <li>- Name</li> <li>- local &amp; remote ports.</li> </ul>	5+5	10
5.	<p>Processing model for outbound &amp; inbound packets</p> <pre> graph TD     subgraph Outbound         A[Outbound IP packet from TCP or UDP] --&gt; B{Search SPD}         B -- No match --&gt; C[DISCARD]         B -- match found --&gt; D{Determine Hop policy}         D -- PROTECT --&gt; E{Search SAD}         D -- BYPASS --&gt; F[forward packet via IP]         E -- match found --&gt; G[Process AH/ESP]         E -- No match --&gt; H[IKE]         G --&gt; F         F --&gt; I[Deliver packet to higher layer]     end     subgraph Inbound         J[Packet Type] --&gt; K{Search SPD}         K -- Not BYPASS --&gt; L[Discard packet]         K -- BYPASS --&gt; M{Search SAD}         M -- Match found --&gt; N[Process AH/ESP]         M -- No match --&gt; L         N --&gt; I     end     I --&gt; O[ ]     </pre>	for 6 expl. 4	10

SL-11

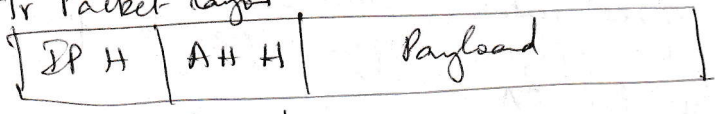
Ch

Question No.	Details of the Answer	Marks Distribution	Total Marks
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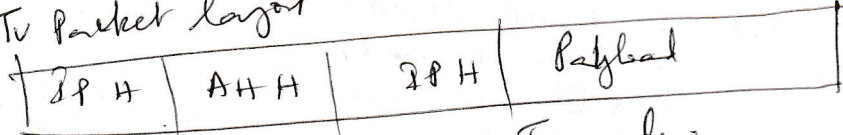
6. Authentication Header (AH)

- Protocol designed to authenticate the source host & to ensure the integrity of the payload carried in IP packet.
- uses hash fn, secret key to create message digest, which is inserted in AH.
- It is then placed in appropriate location based on Transport or Tunnel mode.

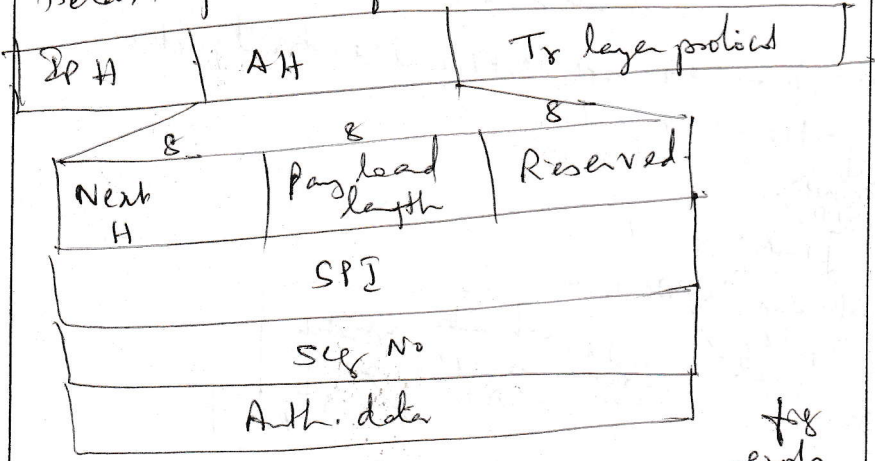
Tr Packet layout



Tv Packet layout



Fields & position of AH in Tr mode.

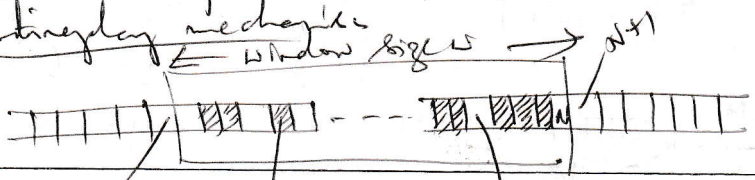


for exm 4  
6

10

7. Padding field is used to expand the plaintext  
padding field is used to assure the alignment  
(padding & Next H be in 32bit)  
Additional padding may be added to  
provide partial traffic-flow confidentiality  
by concealing the actual length of the payload.

Antireplay mechanism



N-W marked if valid packet received unmarked if valid packet not yet received.

*[Signature]*

Question No.	Details of the Answer	Marks Distribution	Total Marks
	<p>If the packet received falls within the window <math>X</math> is new, MAC is checked if the packet is authenticated &amp; the corresponding window is marked.</p> <p>If the packet is to the right of the window <math>X</math> is new, MAC is checked. If packet is <del>advanced</del> authenticated, window is advanced to the next seq no to the right of the window. &amp; the corresponding window slot is marked.</p> <p>If the received packet is left to the window &amp; if authentication fails, the packet is discarded.</p>	<p>2 3</p>	<p>10</p>
<p>7.B)</p>	<p>Features of IKE Key determination:</p> <ul style="list-style-type: none"> <li>- It employs a mechanism known as cookies to thwart classif attacks.</li> <li>- It enables 2 parties to negotiate a group.</li> <li>- It uses nonces to ensure against key exchange.</li> <li>- It enables the use of DH public key values.</li> <li>- It authenticates the DH exchange to thwart man-in-the-middle attacks.</li> </ul>	<p>5</p>	
<p>8</p>	<p>IKE payload &amp; header format.</p> <ul style="list-style-type: none"> <li>- Initiator SPI (6h)</li> <li>- Responder SPI (6h)</li> <li>- Next payload (8)</li> <li>- Major version (4)</li> <li>- minor version (4)</li> <li>- Exchange type (8)</li> <li>- Flags (8)</li> <li>- Header ID (32)</li> <li>- length (32)</li> </ul>		

**CITY ENGINEERING COLLEGE**

**THIRD INTERNAL TEST**

Programme: **ELECTRONICS AND COMMUNICATION**

Course : **Network Security**

Sem & Sec: **8 A**

Duration: **1 ½ hrs.**

Date: **07/05/2024**

Time: **2:30 PM-4:00 PM**

Max Marks: **40**

*Note: Answer all Questions selecting any ONE FULL question from each part.*

Q No	Questions	Marks	CO's	BT'S
<b>PART-A</b>				
1a	a. Define Masquerader, Misfeasor and Clandestine user. Give Examples of Intrusion.	05	CO4	L1, L2
1b	What are the two ways in which a password file can be protected? List the techniques for learning passwords.	05		
<b>OR</b>				
2a	Mention two principal countermeasures for Intruders. Explain the different considerations in Intrusion detection.	05	CO4	L1, L2
2b	Explain Rule-based Intrusion detection.	05		
<b>PART-B</b>				
3	What is Malicious Software? Briefly explain the four phases of Virus lifetime.	10	CO4	L1, L2
<b>OR</b>				
4	Explain Digital Immune System with a neat figure.	10	CO4	L1, L2
<b>PART-C</b>				
5a	Brief about the range of characteristics that a firewall access policy could use to filter traffic.	05	CO5	L1, L2
5b	List the design goals for a firewall <i>and explain briefly.</i>	05		
<b>OR</b>				
6	Explain with neat figures the types of firewalls.	10	CO5	L1, L2
<b>PART-D</b>				
7	What are the common characteristics of a Bastion Host?	10	CO5	L1, L2
<b>OR</b>				
8	Explain Distributed Firewall configuration.	10	CO5	L1, L2

Blooms Taxonomy Levels (BTL): **BT1-Remembering**      **BT2- Understanding**

Course Outcomes (CO's): **CO4: Explain Intruders, Intrusion detection and Malicious Software**

**CO5: Describe Firewalls, Firewall Characteristics, Biasing and Configuration**

# CITY ENGINEERING COLLEGE

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

SCHEME FOR VALUATION- 2023-24

INTERNAL TEST: 03

Semester & Section: VIII A Sub Code: 18ECB21 Sub Name: NS Date: 7/5/24

Question No.	Details of the Answer	Marks Distribution	Total Marks
1a.	<p><u>Masquerader</u> is one who is not authorized to use the computer and who penetrates a system's access control to exploit a legitimate user's account.</p> <p><u>Misfeasor</u> - A legitimate user who access data from for which such access is not authorized.</p> <p><u>clandestine user</u> - An individual who seizes supervisory control of the system &amp; uses this control to evade auditing &amp; access controls &amp; to suppress audit collection. Example of intrusion - remote not compromise of email server.</p>	3	5
1b	<p>Defacing web server, cracking passwords.</p> <p>Two ways of protecting password - one way function &amp; access control.</p> <p>value of fn <math>\rightarrow</math> stored <math>\rightarrow</math> comparison by 2x2 - fixed length - 1 way.</p> <p>Access to password file is limited.</p> <p>Techniques for learning passwords -</p> <ul style="list-style-type: none"> <li>- Try default PW</li> <li>- all short PW</li> <li>- words in dictionary</li> <li>- collect info about user</li> <li>- ph no.</li> <li>- licence plate no.</li> <li>- see trigon house</li> <li>- Tap the betw remote user &amp; host system.</li> </ul>	2	
2a.	<p>Two principal countermeasures for intruders: detection &amp; prevention. (clearing of an attack, challenging security goal).</p>	3	5

Staff *Rf.s.k*

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HOD

Question No.	Details of the Answer	Marks Distribution	Total Marks
2b	<p>Rule-based Intrusion detection:</p> <ul style="list-style-type: none"> <li>- Detect intran by detecting events in the system &amp; applying a set of rules</li> <li>- Historical audit records are analyzed to identify usage patterns &amp; to generate automatically rules that describe patterns.</li> <li>- Rules may represent past behavioral patterns of users, programs &amp; privileges, time slots.</li> <li>- RBD does not require knowledge of security vulnerabilities within the system. observes past behavior.</li> <li>- Rules for identifying known penetrations &amp; that exploit known weaknesses</li> <li>- Rules are specific to m/c &amp; OS (attack tools &amp; scripts on internet)</li> </ul>		5
3	<p>Malicious spw - spw intentionally included in a system for a harmful purpose.</p> <ul style="list-style-type: none"> <li>- These need a host program &amp; are independent.</li> </ul> <p>4 phases of virus -</p> <ul style="list-style-type: none"> <li>(i) Dormant phase - idle virus - activated by date</li> <li>(ii) Propagation phase - copy of virus on other programs (multiply)</li> <li>(iii) Triggering phase - triggered by system events</li> <li>(iv) Execution phase - spw is performed. <u>neg on screen</u> 2x4</li> </ul> <p>destruction of <del>data</del> data files &amp; programs.</p>	2	10
4	<p>Digital immune system.</p> <ul style="list-style-type: none"> <li>- approach to virus protection developed by IBM.</li> <li>- Antivirus was updated on monthly basis.</li> <li>- Interpreted mail system &amp; mobile-program systems has the impact of virus propagation.</li> <li>- Rapid response time</li> <li>- DIS captures virus, analyzes, and detects &amp; shields for it, removes &amp; inform to IBM so it can be detected before it is allowed to run everywhere</li> </ul>	3	

# CITY ENGINEERING COLLEGE

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

SCHEME FOR VALUATION- 2023-24

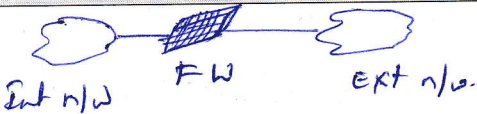
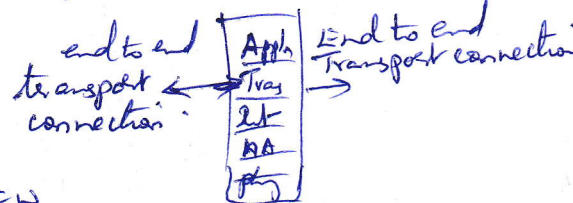
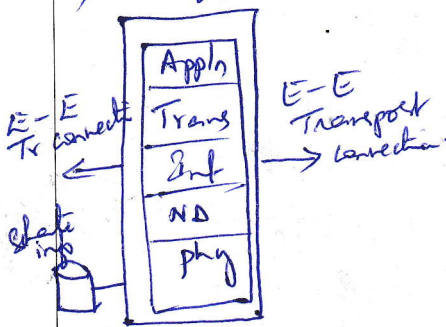
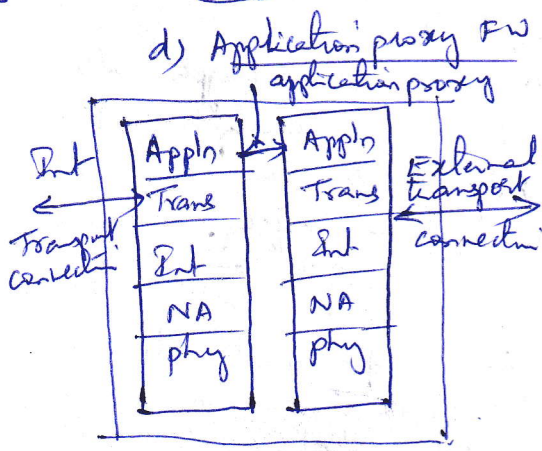
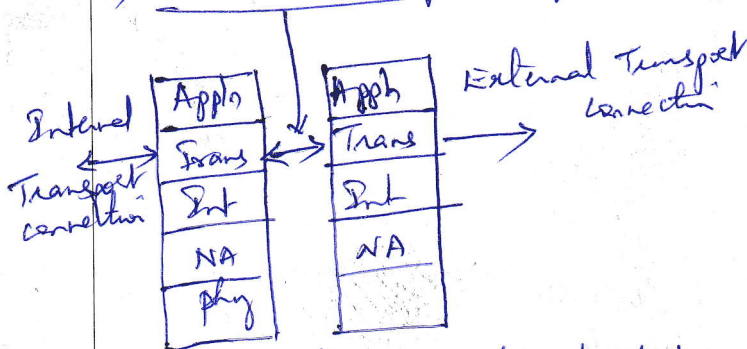
INTERNAL TEST: 3

Semester & Section: B A Sub Code: 18EC281 Sub Name: AS Date: 7/5/24

Question No.	Details of the Answer	Marks Distribution	Total Marks
A	<p>Steps - A monitoring program on each PC informs that a virus is present or not</p> <ul style="list-style-type: none"> <li>- Admin m/c encrypts the sample &amp; sends it to a central virus analysis m/c.</li> <li>- m/c creates an <u>emulsion</u>, infected program can be made to run safely. produces prescription for identifying &amp; removing the virus.</li> <li>- prescription is sent back to admin m/c.</li> <li>- It then forwards to infected client.</li> <li>- subscribers around the world receive regular antivirus updates that protect them from new viruses.</li> </ul>		10
5a.	<p>Range of characteristics that a firewall access policy could use to filter traffic:</p> <ul style="list-style-type: none"> <li>- IP address &amp; protocol values</li> <li>- Application protocol</li> <li>- user identity</li> <li>- N/A activity</li> </ul>	5	5
5b	<p>Design goals for a firewall:</p> <ul style="list-style-type: none"> <li>- All traffic from inside to outside &amp; vice versa must pass through the firewall.</li> <li>- Only authorized traffic will be allowed to pass.</li> <li>- FW itself is immune to penetration.</li> <li>- Trusted computer systems are suitable for bypassing a firewall &amp; often used to <u>grant</u> access.</li> </ul>	5	5

Staff *[Signature]*

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HOD

Question No.	Details of the Answer	Marks Distribution	Total Marks
6	<p>Types of firewalls:</p> <p>a) General model. </p> <p>b) Packet filtering FW </p> <p>c) Stateful inspection FW </p> <p>d) Application proxy FW </p> <p>e) circuit-level proxy firewall: </p>	<p>5</p> <p>5</p> <p>10</p> <p>10</p>	<p>10</p> <p>10</p>
7.	<p>Characteristics of Bastion host:</p> <ul style="list-style-type: none"> <li>- Hardened system / FTP, HTTP, SMTP are disabled /</li> <li>Admin authentication / Each proxy maintains audit info /</li> <li>Each proxy module is small / independent / no disk access /</li> <li>specific host sp / runs a nonprivileged user / support subset.</li> </ul>	<p>10</p>	<p>10</p>
8.	<p>Distributed firewall configuration.</p>		



Question No.	Details of the Answer	Marks Distribution	Total Marks
	<p>Remote user</p> <p>Internet</p> <p>Boundary router</p> <p>External FW</p> <p>Internal DMZ n/w</p> <p>LAN switch</p> <p>LAN switch</p> <p>App &amp; data base servers</p> <p>work stations</p> <p>lock resistor FW</p> <p>Internal protected n/w</p> <p><u>Distributed Firewall configuration</u></p> <p>for expln</p>	<p>6</p> <p>4</p>	<p>10</p>

Staff *S.K.*

*[Signature]*  
HOD

# ATTENDANCE

Sl. No.	Reg. No.	Name	12/12	12/2	13/2	14/2	15/2	20/2	26/2	26/2	27/2	13	15
			1	3	2	1	3	2	1	3	2	1	3
			1	2	3	4	5	6	7	8	9	10	11
1	ICE20EC001	Bhanuchandan. K.B	1	2	3	4	5	6	7	8	9	10	11
2	ICE20EC002	Keerthi. A	1	2	3	4	5	6	7	8	9	10	11
3	ICE20EC003	Sukenth. S.R	0	0	2	3	4	5	5	7	8	9	10
4	ICE21EC400	Md. Tonheed	0	0	2	3	4	5	5	7	8	9	10
5	ICE21EC401	Raghu. T.H.	0	0	1	2	3	4	4	4	4	5	6
6													
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25													
	No. of Absents												
	Initials		B	S	S	S	4	S	S	S	S	S	S







# RECORD OF CLASS WORK

Date	Period	Topics Covered
12-2-2024	1	M1 Introduction to security, computer security, overview, case studies
	3	Need for security, modern nature of attacks
13-2-2024	2	Security approaches, models, security mgmt practices
14-2-2024	1	Principles of security, confidentiality & authentication
	3	Integrity, non repudiation, access control, availability
20-2-2024	2	Types of attacks
26-2-2024	1	Programs that attack computers
	3	Examples
27-2-2024	2	Four generations of virus, specific attacks
4-3-2024	1	M2 Web security considerations, web security threats
	3	web traffic security approaches, SSL-introduction
5-3-2024	2	SSL-protocol stack & record protocol
11-3-2024	1	change cipher spec protocol, alert protocol, Handshake protocol
	3	Four phases of initial exchange
12-3-2024	2	Transport layer security, Pseudorandom fn, alert code
18-3-2024	1	Cipher suites, SST Transport layer - hash keys, packet-exch
	3	User authentication protocol, message types, forward authentication message exchange
19-3-2024	2	connection protocol - mech, ch types, Forward-Port of session
26-3-2024		T1
1-4-2024	1	M3 IP security - overview, appls of IPsec, benefits of IPsec
	3	Routing appls, IPsec documents, IPsec services
2-4-2024	2	Modes of operation - Transport & Tunnel mode, T&TES
8-4-2024	1	security association - SAD & SPD
	3	contd.

S.S.K.

.....  
Teacher's Signature

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HOD'S Signature

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HOD'S Signature





# CITY ENGINEERING COLLEGE

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## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

### CIRCULAR

**Ref: CEC/ECE/DAC/2023-2024/01**

**Date: 02-09-2023**

All the members of Department Advisory Committee are informed to attend a meeting without fail to discuss on the academic related matters.

Date: 04/09/2023

Time: 10.30 AM

Venue: LAB A206

#### **Agenda:**

- Certification course for 3<sup>rd</sup>. year students.
- Conduction of Project Exhibition
- Industrial Visit
- Technical Seminar
- Conduction of guest lectures/ workshops

**Prof. Mallikarjuna G S**

**HOD**





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## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

### Department Advisory Committee Meeting

Date: 04/09/2023

Time: 1:30PM.

Venue: Room No. A107

#### Attendee

Sl. No	Member Name	Designation	Position	Signature
1	Prof. G. S. Mallikarjuna.	HOD	Convenor	
2	Dr. Ravindra.S	Professor	Member	
3	Dr. Shalini Prasad	Associate Professor	Member	
4	SKL Narayana	Assistant Professor	Member	
5	Mrs.Shylaja K	Assistant Professor	Member	

#### Agenda

- Orientation for third semester students
- Planning of Internships for fifth semester students
- Involving students in technical activities
- Conducting workshop/seminar/guest lectures

#### Minutes of the Meeting

During the Department Advisory Committee meeting, an overview of the department was provided. The members discussed suggestions for improvement and reviewed the meeting agenda.

The following points were discussed in the meeting:

- Committee members suggested establishing MOUs with various industries to provide students with internship opportunities.
- It was proposed to conduct a technical symposium with increased student participation.
- The committee decided to organize guest lecture, industry visit, and workshop for students in the 3rd, 5th, and 7th semesters.
- It was discussed to conduct an orientation for 3rd-semester students to raise awareness about 22-Scheme curriculum, particularly regarding registration for NSS, Yoga, or Physical Education.
- The HOD emphasized the importance of projects which help society.



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CITY ENGINEERING COLLEGE, BENGALURU-560061. ACADEMIC CALENDAR 2023-24 Odd SEM														Revised on 25/10/2023	
DAY	OCT 2023		NOV 2023		DEC 2023		JAN 2024		FEB 2024		March 2024		April 2024		
	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	
SUN															
MON	2	GANDHI JAYANTHI					1	II test for 1st sem ,III test for VII sem, I st test V sem, &III sem					1	Start of 4th sem	
TUE	3						2						2		
WED	4		1	RAJYOTSAVA			3						3		
THU	5		2				4		1				4		
FRI	6		3		1		5		2		1		5		
SAT		1st Saturday holiday	4	1st Saturday holiday	2	Alumni Meet 1st Saturday holiday	6	Last Working day I & 7	3	1st Saturday holiday	2	1st Saturday holiday	6	1st Saturday holiday	
SUN	8		5		3		7		4		3		7		
MON	9		6	Ist test I sem and VIIsem	4	II nd test VII sem,ATAL FDP – Basic (4 <sup>th</sup> – 9 <sup>th</sup> Dec)	8	Practical Exam I, 7	5	2nd test 3 <sup>rd</sup> semV sem,	4	III test for V sem,Start of theory 3 <sup>rd</sup>	8		
TUE	10		7		5		9		6		5		9	Ugadhi, Ramzan	
WED	11		8		6		10		7		6		10		
THU	12		9		7		11		8		7		11		
FRI	13		10		8		12		9		8	Maha Shivarathri	12		
SAT	14	MAHALAYA AMAVASA	11		9		13		10		9	Last working day-5th	13		
SUN	15		12		10		14		11		10		14		
MON	16		13		11	ATAL FDP Advanced (11 <sup>th</sup> – 16 <sup>th</sup> Dec)	15	Sankranthi	12		11	Start of practical 5th	15		
TUE	17		14	BALIPADYAMI	12		16		13	Start of 8th sem	12		16		
WED	18		15	Start of 3rd sem	13		17		14		13		17		
THU	19		16		14		18		15		14		18		
FRJ	20		17		15		19		16	Guest Lecture	15		19		
SAT	21	3rd Saturday holiday	18	Graduation Day 3rd Saturday holiday	16	3rd Saturday holiday	20	3rd Saturday holiday	17	3rd Saturday holiday	16	3rd Saturday holiday	20	3rd Saturday holiday	
SUN	22		19		17		21		18		17		21		



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MUN	23	AYUDHA POOJA	20		18		22	THEORY EXAM 1 & 7	19	Start of 2 <sup>nd</sup> sem	18		22	Start of 6th sem
TUE	24	VILAYA DASHAMI	21		19		23		20	Last working day- 3rd	19		23	
WED	25	Start of 5th sem INTERNSHIP	22		20		24		21	Start of practical 3rd	20		24	
THU	26		23		21		25	Industrial Visit - V sem	22		21		25	
FRI	27		24		22	Alumni Interaction	26	Republic day	23		22	Start of theory 5th	26	
SAT	28	VAIMIKI JAYANTHI	25	Start of 5th sem class	23		27		24		23		27	
SUN	29		26		24		28		25		24		28	
MON	30		27		25	CHRISTMAS	29		26		25	Hol	29	
TUE	31		28		26		30		27		26		30	
WED			29		27		31		28		27			
THU			30	KANAKADASA JAYANTHI	28				29		28			
FRI					29	Tech Symposium					29	Good Friday		
SAT					30						30			
SUN					31						31			

*A.S. Malikanjuz*

Professor & Head  
Dept. of Electronics &  
Communication Engineering  
City Engineering College,  
Doddakallasandra, Kanakapura Main Road,  
Bangalore-560 052.

*Principals*  
PRINCIPAL  
CITY ENGINEERING COLLEGE  
Kanakapura Main Road, BANGALORE - 560 051



**CITY ENGINEERING COLLEGE, BENGALURU-560061. ACADEMIC CALENDAR 2023-24 Odd SEM Revised on 26/10/2023**

**DEPT OF E&CE**

	OCT 2023		NOV 2023		DEC 2023		JAN 2024		FEB 2024		March 2024		April 2024		
DAY	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	
SUN	1														
MON	2	GANDHI JAYANTHI					1	II test for 1st sem , III test for VII sem, I st test V sem, & III sem					1	Start of 4th sem	
TUE	3						2							2	
WED	4		1	RAJYOTSAVA DAY			3							3	
THU	5		2				4		1				4		
FRI	6		3		1		5	GUEST LECTURE 2	2		1		5		
SAT	7	1st Saturday holiday	4	1st Saturday holiday	2	Alumni Meet 1st Saturday holiday	6	Last Working day 1 & 7	3	1st Saturday holiday	2	1st Saturday holiday	6	1st Saturday holiday	
SUN	8		5		3		7		4		3		7		
MON	9		6	1st test I sem and VII sem	4	II nd test VII sem,	8	Practical Exam 1, 7	5	2nd test 3 <sup>rd</sup> sem V sem,	4	III test for V sem, Start of theory 3 <sup>rd</sup>	8		
TUE	10		7		5		9	6			6		9	Ugadhi, Ramzan	
WED	11		8		6		10	7			7		10		
THU	12		9		7		11	8			8		11		
FRI	13		10	GUEST LECTURE 1	8		12		9		8	Maha Shivarathri	12		
SAT	14	MAHALAYA AMAVASA	11		9		13		10		9	Last working day- 5th	13		
SUN	15		12		10		14		11		10		14		
MON	16		13		11		15	Sankranthi	12		11	Start of practical 5th	15		
TUE	17		14	BALIPADYAMI	12		16		13	Start of 8th sem	12		16		
WED	18		15	Start of 3rd sem	13		17		14		13		17		
THU	19		16		14		18		15	GUEST LECTURE	14		18		
FRI	20		17		15		19		16		15		19		
SAT	21	3rd Saturday holiday	18	Graduation Day 3rd Saturday holiday	16	3rd Saturday holiday	20	3rd Saturday holiday	17	3rd Saturday holiday	16	3rd Saturday holiday	20	3rd Saturday holiday	
SUN	22		19		17		21		18		17		21		
MON	23	AYUDHA POOJA	20		18		22	THEORY EXAM 1 & 7	19	Start of 2 <sup>nd</sup> sem	18		22	Start of 6th sem	
TUE	24	VIJAYA DASHAMI	21		19	WORKSHOP	23		20	Last working day- 3rd	19		23		
WED	25		22	INDUSTRIAL VISIT	20		24		21	Start of practical 3rd	20		24		
THU	26		23		21		25		22		21		25		
FRI	27		24		22		26	Republic day	23		22	Start of theory 5th	26		
SAT	28	VALMIKI JAYANTHI	25	Start of 5th sem class	23		27		24		23		27		
SUN	29		26		24		28		25		24		28		
MON	30		27		25	CHRISTMAS	29		26		25	Holi	29		
TUE	31		28		26		30		27		26		30		
WED			29		27		31		28		27				
THU			30	KANAKADASA JAYANTHI	28				29		28				
FRI					29	P.S. malikarjuna					29	Good Friday			
SAT					30							30			
SUN					31							31			

  
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## Department of Electronics and Communication Engineering

### COURSE PREFERENCE

ACY:2023-24 (odd)

Name of the Faculty: Dr. Ravindra. S

Designation: Professor.

Sl.No	Course code and name	Year/Semester
1	Electro magnetic wave 21ECS4	2023 / 5 <sup>th</sup>
2.	Basic Electronics BESCK201	2023 / 1 <sup>st</sup>
3.	Computer network. 18EC71	2023 / 3 <sup>rd</sup>
4.	Photocopy. 18ECP78.	2023 / 7 <sup>th</sup> .

Ravindra S  
Faculty

*R. S. Ravindra S*  
HOD, ECE  
Professor & Head  
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## Department of Electronics and Communication Engineering

### COURSE PREFERENCE


ACY:2023-24 (odd)

Name of the Faculty: MadhaviJKulkarni

Designation:

Sl.No	Course code and name	Year/Semester
01.	RTS (18EC731)	2023/7 <sup>th</sup>
02	COA (21EC52)	2023/5 <sup>th</sup>
03	Sensors and Instrumentation (BEC306B)	2023/3 <sup>rd</sup>
04	Analog and Digital systems Design Lab (BEC1305)	2023/3 <sup>rd</sup>

  
Faculty

  
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Professor & Head  
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ACADEMIC YEAR: 2023-24 (ODD)

## DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING COURSE ALLOCATION

Sl No.	Name of the Faculty	Course Code and Name	Year/ Semester	Signature
1	Prof. G.S. Mallikarjuna	Basic Electronics (BESCK104C) Network Analysis (BEC304) Python Programming(18EC74)	I / 1 <sup>st</sup> II / 3 <sup>rd</sup> IV / 7 <sup>th</sup>	
2	Dr.Ravindra.S.	Project work(18ECP78) Electromagnetic wave theory(21EC54)	IV / 7 <sup>th</sup> III / 5 <sup>th</sup>	
3.	Dr. Shalini Prasad	Research methodology and IPR (21EC56) IOT and wireless sensor network (18EC741) Introduction to Electronics (BESCK104C)	III / 5 <sup>th</sup> IV / 7 <sup>th</sup> I / 1 <sup>st</sup>	
4	Mrs. Shylaja K	Electronic principles and circuits (BEC303) Digital Communication(21EC51) Analog and Digital Systems Design Lab (BECL305) Introduction to electronics and communication (BESCK104C)	II / 3 <sup>rd</sup> III / 5 <sup>th</sup> II / 3 <sup>rd</sup> I / 1 <sup>st</sup>	



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5.	Mrs. Madhavi J Kulkarni	Real Time Systems(18EC731) Arm and Computer organization and Architecture(21EC52) Sensors and Instrumentation (BEC306B) Analog and Digital Systems Design Lab (BECL305)	IV / 7 <sup>th</sup> III / 5 <sup>th</sup> II / 3 <sup>rd</sup> II / 3 <sup>rd</sup>	
6	Gopikishan J	Computer network(18EC71) Computer Communication Network(21EC53) MATLAB(BEC358B) Computer network(18ECL76)	IV / 7 <sup>th</sup> III / 5 <sup>th</sup> II / 3 <sup>rd</sup> IV / 7 <sup>th</sup>	
7	Vishva kiran R.C	Introduction to electronics and communication (BESCK104C) VLSI Design(18EC72) VLSI Lab(18ECL77)	I / 1 <sup>st</sup> IV / 7 <sup>th</sup> IV / 7 <sup>th</sup>	
8	SKL Narayana	Computer Communication Networks(21EC53)	III / 5 <sup>th</sup>	
9	Sravanthi K Ravi	Digital system design using Verilog (BEC302)	II / 3 <sup>rd</sup>	

[G S Mallikarjuna]  
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# CITY ENGINEERING COLLEGE

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

## ODD 2023-2024 TIME TABLE

SEMESTER: VII EC 'A' SEC CBCS

2018 SCHEME

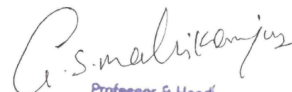
CLASS ROOM: A104

DAY	1	2	TEA	3	4	LUNCH	5	6	7
	9:30 AM 10:20 AM	10:20AM 11:10 AM	11:10 AM 11:30 AM	11:30 AM 12:20 PM	12:20 PM 1:10 PM	1:10 PM 2:00 PM	2:00 PM 2:50 PM	2:50 PM 3:40 PM	3:40 PM 4:00 PM
MON	18EC741	18EC731	<b>B R E A K</b>	18EC72	TUT	<b>L U N C H</b>	PROJECT WORK		
TUE	18EC71	18CS741		18EC752	TUT		PROJECT WORK		
WED	18CS752	18EC71		18EC731	TUT		18ECL76		
THU	18EC71	18EC72		18EC731	TUT		18ECL77		
FRI	18EC72	18CS752		18EC741	TUT		PROJECT WORK		
SAT	PROJECT WORK			PROJECT WORK					

SUBJECT CODE	SUBJECT NAME	SUBJECT HANDELED
18EC71	CN	Prof. Gopikishan .J
18EC72	VLSI	Prof. Vishvakiran .R.C
18EC731	RTS	Prof. Madhavi .J. Kulkarni
18EC741	IOT	Dr. Shalini Prasad
18CS752	PYTHON	Prof. SKL Narayana
18ECL76	CN LAB	A1 Prof. Gopikishan.J
18ECL77	VLSI LAB	A1 Prof. Vishvakiran .R.C



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 Professor & Head  
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# CITY ENGINEERING COLLEGE

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

**2023-2024 TIME TABLE**

PROF. Madhavi Kulkarni

**SEMESTER: VII**

DAY	1	2	TEA	3	4	LUNCH	5	6	7	
	9:00 AM 10:00AM	10:00 AM 11:00 AM	11:00 AM 11:15 AM	11:15 AM 12:15 PM	12:15 PM 01:15 PM	01:15 PM 02:00 PM	2:00 PM 3:00 PM	3:00 PM 4:00 PM	4:00 PM 5:00 PM	
MON		<b>18EC731</b>	<b>B R E A K</b>			<b>L U N C H</b>	<b>PROJECT WORK</b>			
TUE							<b>PROJECT WORK</b>			
WED				<b>18EC731</b>						
THU				<b>18EC731</b>						
FRI										
SAT										



TIMETABLE Co-ordinator

*A.S. Malikarjuna*  
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 Bengaluru-560 061.

*Dr. Swamy*  
 PRINCIPAL  
**CITY ENGINEERING COLLEGE**  
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Year : 2023 - 2024

Semester : Odd / Even


Name of the Teacher : ..... Madhavi J. Kulkarni .....

Designation : ..... A-P .....

Department : ..... EC .....

	Sem/Branch	Subject Code	Subject
1.	<u>07/EC</u>	<u>18EC731</u>	<u>Real Time Systems</u>
2.	.....	.....	.....
3.	.....	.....	.....

	Initials at the End of the			
	1st Month	2nd Month	3rd Month	Semester
Staff	<u>MA</u>	<u>MD</u>	<u>ME</u>	<u>MP</u>
HOD	<u>CA</u>	<u>CB</u>	<u>CC</u>	<u>CD</u>
Principal				



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## REAL TIME SYSTEM

Course Code	: 18EC731	CIE Marks	: 40
Lecture Hours/Week	: 3	SEE Marks	: 60
Total Number of Lecture Hours	: 40 (08 Hrs / Module)	Exam Hours	: 03
CREDITS – 03			

**Course Learning Objectives:** This Course will enable students to:

- Understand the fundamentals of Real-time systems and its classifications.
- Describe the concepts of computer control and hardware components for Real-Time Application.
- Discuss the languages to develop software for Real-Time Applications.
- Explain the concepts of operating system and RTS development methodologies.

### Module-1

**Introduction to Real-Time Systems:** Historical background, Elements of a Computer Control System, RTS- Definition, Classification of Real-time Systems, Time Constraints, Classification of Programs.

**Concepts of Computer Control:** Introduction, Sequence Control, Loop Control, Supervisory Control, Centralized Computer Control, Hierarchical Systems.

(Text: 1.1 to 1.6 and 2.1 to 2.6),

L1, L2

### Module-2

**Computer Hardware Requirements for Real-Time Applications:** Introduction, General Purpose Computer, Single Chip Microcomputers and Microcontrollers, Specialized Processors, Process-Related Interfaces, Data Transfer Techniques, Communications, Standard Interface.

(Text: 3.1 to 3.8).

L1, L2

### Module-3

**Languages for Real-Time Applications:** Introduction, Syntax Layout and Readability, Declaration and Initialization of Variables and Constants, Cutoff, Modularity and Variables, Compilation of Modular Programs, Data types, Control Structures, Exception Handling, Low-level facilities, Co-routines, Interrupts and Device Handling, Concurrency, Real-Time Support, Overview of Real-Time Languages.

(Text: 5.1 to 5.14),

L1, L2, L3

### Module-4

**Operating Systems:** Introduction, Real-Time Multi-Tasking OS, Scheduling Strategies, Priority Structures, Task Management, Scheduler and Real-Time

Clock Interrupt Handler, Memory Management, Code Sharing, Resource Control, Task Co-Operation and Communication, Mutual Exclusion.

(Text: 6.1 to 6.11).

L1, L2

#### Module-5

**Design of RTS – General Introduction:** Introduction, Specification Document, Preliminary Design, Single-Program Approach, Foreground/Background System.

**RTS Development Methodologies:** Introduction, Yourdon Methodology, Ward and Mellor Method, Hatley and Pirbhai Method.

(Text: 7.1 to 7.5 and 8.1, 8.2, 8.4,8.5).

L1, L2, L3

**Course Outcomes:** At the end of the course, students should be able to:

1. Explain the fundamentals of Real time systems and its classifications.
2. Understand the concepts of computer control and the suitable computer hardware requirements for real-time applications.
3. Describe the operating system concepts and techniques required for real time systems.
4. Develop the software algorithms using suitable languages to meet Real time applications.
5. Apply suitable methodologies to design and develop Real-Time Systems.

#### Text Book:

- Real-Time Computer Control, Stuart Bennet, 2<sup>nd</sup> Edn. Pearson Education. 2008.

#### Reference Books:

1. "Real –Time Systems", C.M. Krishna, Kang G. Shin, McGraw –Hill International Editions, 1997.
2. Real-Time Systems Design and Analysis, Phillip. A. Laplante, second edition, PHI, 2005.
3. Embedded Systems, Raj Kamal, Tata McGraw Hill, India, third edition, 2005.

# LESSON PLAN

Week	Date		Topics Planned
	From	To	
I	11.9.23	15.9.23	<u>MODULE 1</u> Introduction to RTS: Historical Background Elements of Computer system generalised Computer system
II	18.9.23	23.9.23	Definition RTS, Classification Classification of Programs. Introduction to sequence control, Continuous and Batch control.
III	25.9.23	30.9.23	Batch Process, PID Adaptive Control Supervisory control, Hierarchical Systems, distributed systems and Control Engineers.
IV	2.10.23	7.10.23	<u>MODULE 2</u> : Computer H/W requirements of RTS, General purpose digital computer Single chip $\mu c$ & $\mu p$ Parallel Computers.
V	9.10.23	14.10.23	Process related and Digital related Analog and pulse interface, Analog Input & output system, Data transfer Data transfer Techniques
VI	16.10.23	21.10.23	Interrupt mechanism, e.g. DMA Flowchart. communications LAN WAN standard interface ISO layer
VII	23.10.23	28.10.23	<u>MODULE 3</u> : Languages of RTS: Introduction to syntax layout, Readability, Declaration of Variables and Constants.
VIII	30.10.23	4.11.23	Modularity and Variables, scope & visibility, global & local variables control and scope, compilation of Modular programs

SD - 14/18/23  
LWD - 6/1/24

## LESSON PLAN


Week	Date		Topics Planned
	From	To	
IX	6.11.23	11.11.23	Data types / Control structure Exception Handling, Coroutines, interrupts concurrently overview of RTS.
X	13.11.23	18.11.23	MODULE 04 operating system - OS Scheduling, Priority structure cyclic task, delay task & Base level
XI	20.11.23	25.11.23	Task management and Scheduler & RTS at Interrupt handler
XII	27.11.23	28.11.23	Memory Management, Code Sharing Resource Control, co-operation Mutual Exclusion and Data Transfer.
XIII	4.12.23	9.12.23	MODULE 05: Design of RTS: Speci- -cation Document, Preliminary Design, Single Program approach
XIV	11.12.23	16.12.23	Foreground and Background Approach Yurdon methodology, ward and mellor method.
XV	18.12.23	23.12.23	Hately and Pirbhai method Requirements model and Archi- -ecture model
XVI	25.12.23	30.12.23	Essentially Hately & Pirbhai method
XVII	1.1.24	6.1.24	Architectural Model & Revision

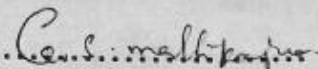
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HOD'S Signature

## RECORD OF CLASS WORK

Date	Period	Topics Covered
11.9.23	1	Introduction to RTs
13.9.23	3	Module 01 Back ground, Elements of CS
14.9.23	3	Hot Air Blower, H/W & S/W Interface
18.9.23	1	Communication task, Classification of RTs
20.9.23	3	Interactive System, Time Constraints
21.9.23	3	Classification of Programs & Applications
25.9.23	1	Module 1: PID & Loop Control & DDC Applications
27.9.23	3	Adaptive controls, Hierarchical systems
4.10.23	3	HCI, Control Engineers & Benefits of CS.
5.10.23	1	Module 2: H/W Requirements; General Purpose
9.10.23	3	Specialised processors, Analog Interface
11.10.23	3	Pulse Interface & Data Transfer Technique
12.10.23	1	Interrupts & Interrupt Mechanism
16.10.23	3	Multilevel Interrupts DMA
18.10.23	3	Communications, LAN & STD Interface
19.10.23	1	Module 3: Languages of RTs Introduction
23.10.23	3	Syntax layout & Readability, Constants
25.10.23	3	Modularity & Variables
26.10.23	1	Compilation of Modular Programs
30.10.23	3	Data types & Control structures.
1.11.23	3	Control Structure
2.11.23	1	Exception Handling
6.11.23	3	Low level facilities, concurrency
8.11.23	3	Co-routines & <del>control</del> Runtime Support


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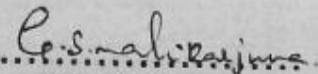
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## RECORD OF CLASS WORK

Date	Period	Topics Covered
9.11.23	1	Overview of RTS Languages
13.11.23	3	Mod04: OS: Introduction
15.11.23	3	RTS multitasking & scheduling
16.11.23	1	Priority structure
22.11.23	3	Task Management
23.11.23	3	RTS clock, Interrupt Handler
27.11.23	1	Memory Management & code St
29.11.23	3	Resource Control
30.11.23	3	Task co-operation and Communic
4.12.23	1	Mutual exclusion & OS Kernel
6.12.23	3	Data Transfer & liveness
7.12.23	3	Mod5: Design of RTS Introduction
11.12.23	1	Preliminary Design (H/W & S/W)
13.12.23	3	Single Program, Foreground & Bac
14.12.23	3	Yarden methodology.
18.12.23	I <sup>st</sup> Test	
20.12.23	II <sup>nd</sup> I <sup>st</sup> Test	
21.12.23	3	Ward & Mellor Method
26.12.23	1	Essential & Behavioral Model
27.12.23	3	Implementation & Enhancing it
28.12.23	3	Hotley and Piribhai Method
1.1.24	1	Architectural Model
3,4,5/1/24	3 <sup>rd</sup>	Internal Assessment Test
6/1/24	Last Working Day.	

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 Teacher's Signature

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# CITY ENGINEERING COLLEGE

DEPARTMENT OF ELECTRONICS & COMMUNICATION

SEM: VII

Subject Code: 18EC731

Date:

## Assignment / Question bank for Real Time Systems Module-1

1. What is real time system. Explain general computer control system with neat block diagram ( fig 1.4, pg21)
2. Define RTS? Explain different classifications of RTS with examples.
3. Explain computer control system showing H/W & S/W interface. (fig.1.5 pg.)
4. Explain different types of programs in system design.
5. Define 1) Clock based system. 2) Event based system. 3) Interactive system.
6. What is "Time constraints"? How RTS classified based on time constraints.
7. Explain with diagram computer control system for hot air blower.
8. a) Explain with block diagram continuous feedback control system  
b) Sampled feedback control system.
9. Explain with neat diagram computer control system showing communication task (fig. 1.8, pg25).
10. Explain with block diagram computer control system (fig1.9, pg30).
11. Explain sequence control for single chemical reactor vessel with diagram (pg39, fig2.1)
12. Explain batch processing, continuous process & laboratory system.
13. Explain with block diagram chemical batch processing (fig2.2, pg41)
14. Explain with neat block diagram DDC (fig2.4, pg44)
15. Explain one application of DDC / explain boiler control system (pg47, fig 2.5)
16. Draw and explain? 1) General structure of feedback configuration 2) General structure of inferential control configuration.
17. Explain binary distillation column with diagram? (pg49, fig2.8)
18. Explain 3 adaptive control system (pg51, fig2.9 & 2.10)
19. Explain supervisory control system with diagram (fig2.13, pg54)
20. a) self-tuning adaptive system. b) Model reference adaptive control (fig2.11, 2.12, pg53)
21. Explain one application of supervisory control (pg55, fig2.14)
22. Explain dwell computer scheme (pg56, fig2.15)
23. Explain hierarchical system for function and decision-making structure.
24. Explain batch control using hierarchical systems and software.
25. Explain control engineers' responsibility.
26. Write a note on (a) distributed system (b) HCI (c) economics and benefits of control system.



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SEM: VII

Subject Code: 18EC731

Date:

## Assignment / Question bank for Real Time Systems Module-2

1. Explain with neat diagram general purpose digital computer system (fig3.1, pg69)
2. Explain with diagram single chip computer (fig3.2, pg73).
3. Explain SIMD, MISD & MIMD with reference to parallel computers (pg75, fig3.3)
4. Explain with neat figures simple digital input interference and digital output interference along with READ (I/P) timing diagram. (pg77, fig 3.3, 3.4 & 3.5)
5. Explain pulse input and output interference with neat diagram. (pg81, fig 3.7)
6. Explain with diagram analog input and analog output system. (fig3.8, 3.9, pg84)
7. Explain polling (pg88, fig.3.10, 3.11)
8. What is an interrupt? And explain with figure interrupt power control (fig3.12, pg90).
9. Explain with flow chart basic interrupt mechanism? (fig3.13, pg. 94).
10. Write a note on saving and restoring registers.
11. Explain with neat diagram DIASY-CHAIN interrupt structure. (pg95, fig3.15).
12. Explain interrupt vectoring using priority encoding circuit (pg.96, fig.3.16)
13. Explain with diagram multi-level interrupt & interrupt masking.
14. Draw and explain functions performed by interrupt service routine with flow diagram.
15. Explain asynchronous and synchronous transmission technique.
16. Explain in detail LAN topologies with figures.
17. Explain with diagram ISO seven-layer model



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DEPARTMENT OF ELECTRONICS & COMMUNICATION

SEM:VII

Subject Code: 18EC731

Date:

## Assignment /Question bank for Real Time Systems

### Module-3

1. Explain the following (i)Security (ii) Readability (iii) Flexibility (iv) Simplicity (v) portability (vi)Efficiency
2. Explain Briefly Declarations and Initialization of Variables and constants
3. Explain Briefly Modularity and Visibility
4. Discuss different Data types with example
5. Explain with Neat Diagram Standard Structured Program Constructs
6. Write a Note on (I) Exception Handling (II) Interrupts and Device Handling
7. Explain with Diagram Simple Table Driven System
8. Explain with Diagram Table Driven System with Data base Manager and Forms Processor for table driven System.
9. Explain Briefly "CUTCLASS"
10. Explain Four Language Subset in RTS
11. Draw and Explain CUTCLASS Host –Target Configuration



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DEPARTMENT OF ELECTRONICS & COMMUNICATION

SEM:VII

Subject Code: 18EC731

Date:

## Assignment /Question bank for Real Time Systems

### Module-4

1. Draw and Explain General purpose Operating System (fig 6.1 pg 213)
2. Draw and Explain General Structure of Simple OS(fig 6.3,pg 215)
3. Draw and Explain REAL Time Multitasking OS
4. Draw and Explain Real Time OS
5. Briefly Explain Cyclic and Preemptive Scheduling Strategies
6. Draw and Explain Priority levels in an RTOS
7. Explain Cyclic Task with example (pg 223)
8. Draw and Explain Task state Diagram(227)
9. Write a note on Task Descriptor
10. Explain RTOS Task state Diagram
11. Draw and Explain RTOS Task Structures Diagram
12. Draw and Explain RTOS Search by Dispatcher
13. Draw and Explain RTOS Foreground/Background Data Storage system
14. Draw and Explain Partitioned and Non-Partitioned Memory
15. Draw and Explain Task Chaining and Swapping
16. Draw and Explain Task Overlaying
17. Draw and Explain Serially Reusable code
18. Draw and Explain RE-Entrant code in Process Control
19. Draw and Explain General Structures of IOSS
20. Draw and Explain Detailed Arrangement of IOSS
21. Draw and Explain IOSS Operations for Input of data
22. Write a note (a) Mutual Exclusion (b) Semaphore
23. Draw and Explain Mutual Exclusion using binary semaphore
24. Write a note on Printer queue
25. Draw and Explain Task Synchronization without Data Transfer



# CITY ENGINEERING COLLEGE

DEPARTMENT OF ELECTRONICS & COMMUNICATION

SEM:VII

Subject Code: 18EC731

Date:

## Assignment /Question bank for Real Time Systems VII SEM 18 EC 731 Module-5

1. Draw and Explain Planning Phase of RTS
2. Draw and Explain Development phase
3. Discuss Hardware Design of RTS
4. Draw and Explain Basic software modules
5. Draw and Explain Single Program approach (flowchart, fig 7.4,pg 289).
6. Draw and Explain Flowchart of Single Program Foreground/background approach
7. Draw and Explain Software Modules for foreground/background System with Data Storage
8. Draw and Explain Software modeling
9. Draw and Explain Abstract Modeling of Ward and Mellor
10. Draw and Explain (i) Relationship between Models and Diagrams (ii) Drying Oven OR
11. Draw and Explain Building Essential Model in Environmental Model
12. Draw and Explain Behavioral Essential Model (pg 331)

**ASSIGNMENT 02 REAL TIME SYSTEMS**

1. Write a note on saving and restoring registers.
2. Explain with neat diagram DIASY-CHAIN interrupt structure.
3. Draw and explain functions performed by interrupt service routine with flow diagram
4. Explain asynchronous and synchronous transmission technique
5. Explain in detail LAN topologies with figures
6. Explain with diagram ISO seven-layer model
7. Explain interrupt vectoring using priority encoding circuit
8. Explain the following (i)Security (ii) Readability (iii) Flexibility (iv) Simplicity (v) portability (vi)Efficiency
9. Explain with Neat Diagram Standard Structured Program Constructs
10. Write a Note on (I) Exception Handling (II) Interrupts and Device Handling
11. Explain with Diagram Simple Table Driven System
12. Explain with Diagram Table Driven System with Data base Manager and Forms Processor for table driven System.
13. Draw and Explain CUTCLASS Host –Target Configuration
- 14 Explain Four Language Subset in RTS
- 15 Explain Briefly Modularity and Visibility

**ASSIGNMENT 03 REAL TIME SYSTEMS**

1. Draw and Explain Planning Phase of RTS
2. Draw and Explain Single Program approach (flowchart, fig 7.4,pg 289).
3. Draw and Explain Software modeling
4. Draw and Explain Building Essential Model in Environmental Model
5. Draw and Explain Behavioral Essential Model (pg 331)
6. Draw and Explain RTOS Foreground/Background Data Storage system
7. Draw and Explain Detailed Arrangement of IOSS
8. Draw and Explain Task Synchronization without Data Transfer
9. Draw and Explain RE-Entrant code in Process Control
10. Draw and Explain Partitioned and Non-Partitioned Memory
11. Draw and Explain RTOS Search by Dispatcher
12. Draw and Explain Task Overlaying
13. Draw and Explain Cyclic Task with example
14. Explain RTOS Task state Diagram
15. Draw and Explain Task Chaining and Swapping



**CBCS SCHEME**

USN

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(8EC73)

Seventh Semester B.E. Degree Examination, Feb./Mar. 2022

**Real Time Systems**

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- |   |  |            |
|---|--|------------|
| 1 | a. Define real time system. Classify them based on time constraints. | (06 Marks) |
|   | b. Write a short note on hierarchical system.                        | (04 Marks) |
|   | c. Explain the different types of program in system design.          | (10 Marks) |

OR

- |   |  |            |
|---|--|------------|
| 2 | a. Explain briefly sequence control with neat diagram.   | (06 Marks) |
|   | b. What is DDC? Explain with block diagram.              | (06 Marks) |
|   | c. Explain ISO seven layer model for data communication. | (08 Marks) |

Module-2

- |   |  |            |
|---|--|------------|
| 3 | a. Explain the different forms of parallel computer architectures.                   | (12 Marks) |
|   | b. Explain pulse interface for input and output operation with a neat block diagram. | (08 Marks) |

OR

- |   |   |            |
|---|---|------------|
| 4 | a. Explain the basic interrupt input mechanism with diagram and flow chart. | (10 Marks) |
|   | b. Explain local and wide area networks.                                    | (10 Marks) |

Module-3

- |   |   |            |
|---|---|------------|
| 5 | a. Explain the following:<br>i) Security ii) Readability iii) Flexibility iv) Efficiency. | (17 Marks) |
|   | b. List out some major requirements that C/PLASS language has to meet.                    | (10 Marks) |

OR

- |   |  |            |
|---|--|------------|
| 6 | a. Write short notes on overview of real time languages. | (08 Marks) |
|   | b. What are the data types? Explain each one briefly.    | (12 Marks) |

Module-4

- |   |   |            |
|---|---|------------|
| 7 | a. Explain with neat diagram structures of RTOS.        | (10 Marks) |
|   | b. Explain cyclic and preemptive scheduling strategies. | (10 Marks) |

OR

- |   |   |            |
|---|---|------------|
| 8 | a. Draw and explain task state diagram.                             | (11 Marks) |
|   | b. Explain the general structures of Input Output Subsystem (IOSS). | (10 Marks) |

Module-5

- |   |   |            |
|---|---|------------|
| 9 | a. With neat flow-chart describes single program approach with reference to R/T S design. | (10 Marks) |
|   | b. Explain software design of R/T S using software module.                                | (10 Marks) |

OR

- |    |  |            |
|----|--|------------|
| 10 | a. Explain the outline of abstract modeling approach of Ward and Mellor. | (11 Marks) |
|    | b. Write a short note on YOURDON METHODOLOGY.                            | (09 Marks) |

\*\*\*\*\*

Important Note: 1. On completing your answers, page 3 will be for final assessment on the remaining blank pages.  
 2. After ending of identification, question values are given in the table below.

**CITY ENGINEERING COLLEGE**  
**FIRST INTERNAL TEST**

Branch: E&C  
Sub Name: RTS  
Sem: VII  
Duration: 1 ½ hrs.

Date: 16/11/2023  
Time: 10:30AM~12:00  
Max Marks: 50



*Note: Answer all Questions selecting any ONE FULL question from each part.*

Q No.	Sub Q No.	Questions	Marks	CO's	BT'S
-------	-----------	-----------	-------	------	------

PART-A

1	a	Define RTS? Explain different classifications of RTS with examples	10	CO1	L1, L2
<i>OR</i>					
2	a	Explain batch processing, continuous process & laboratory system	10	CO1	L1, L2,

PART-B

3	a	Explain with block diagram chemical batch processing	10	CO1	L1, L2,
<i>OR</i>					
4	a	Explain three adaptive control system	10	CO1	L1, L2,

PART-C

5	a	Explain Dual computer scheme	10	CO1	L1, L2
<i>OR</i>					
6	a	Explain with neat diagram general purpose digital computer system	10	CO2	L1, L2

PART-D

7	a	Explain supervisory control system with diagram	10	CO2	L1, L2
<i>OR</i>					
8	a	Explain with diagram single chip computer	10	CO2	L1, L2

PART-E

9	a	Explain pulse input and output interference with neat diagram	10	CO2	L1, L2
<i>OR</i>					
10	a	Explain with flow chart basic interrupt mechanism	10	CO2	L1, L2

**Bloom's Taxonomy: L1: Remembering, L2: Understanding**

**Course Outcomes: CO1: Fundamentals of RTS and classification ,CO2: Concepts of computer control,**

**CITY ENGINEERING COLLEGE**  
**DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING**  
**SCHEME FOR VALUATION**

INTERNAL TEST: 01

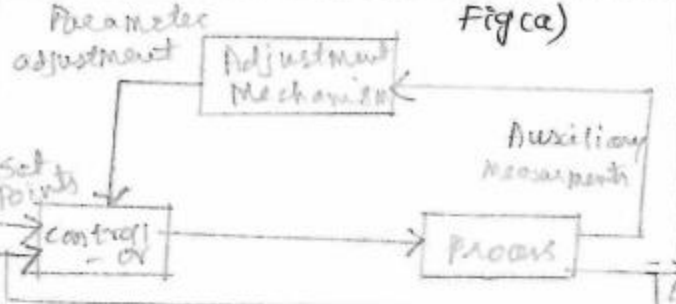
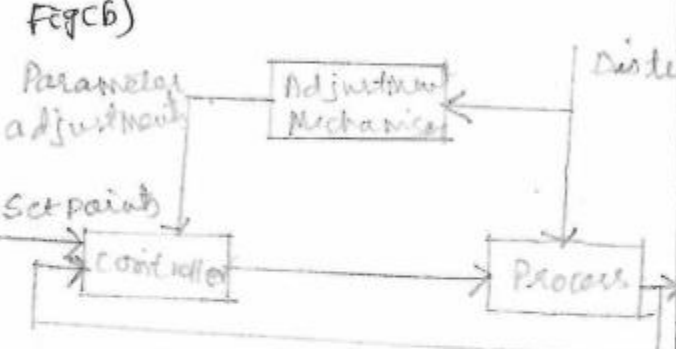
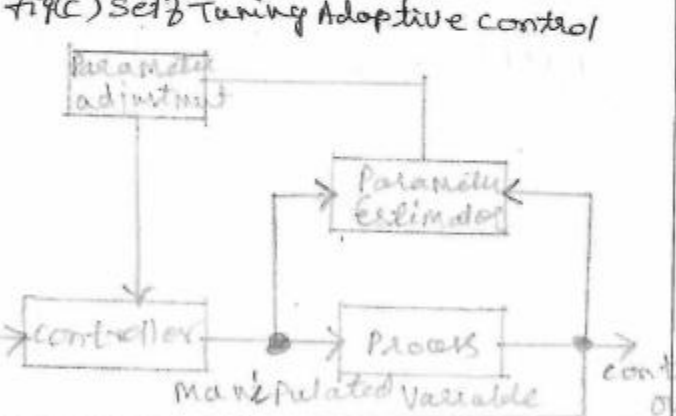
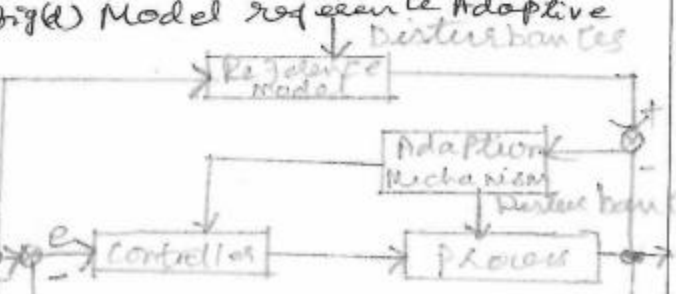
Semester & Section: 7 A Sub Code: 18EC731 Sub Name: RTS Date: 14.11.23

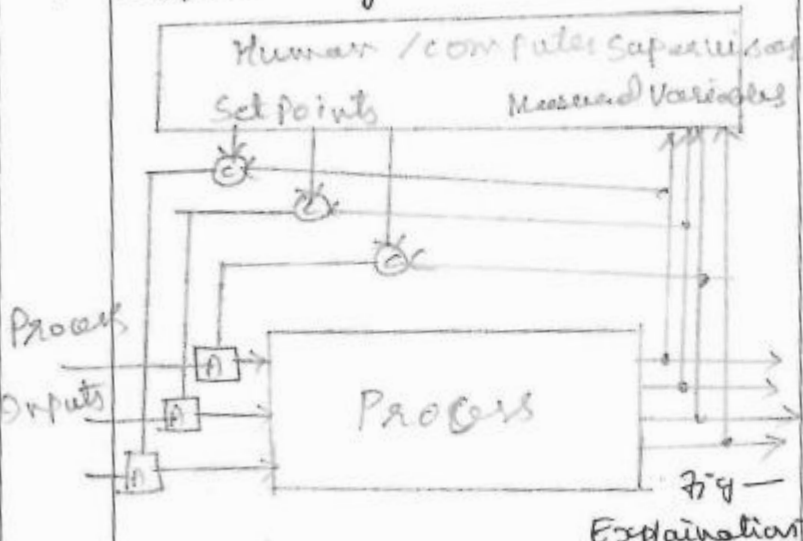
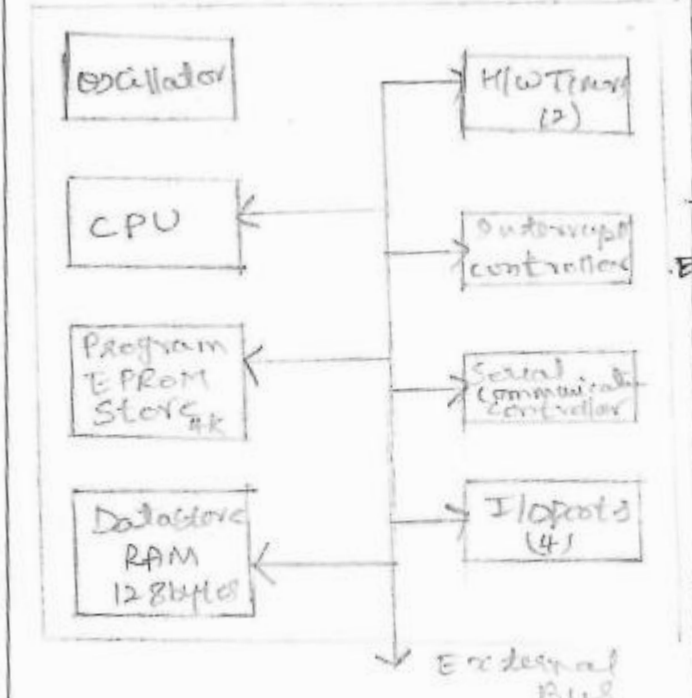
Question No.	Details of the Answer	Marks Distribution	Total Marks
1.	<p>RTS: are those which must produce correct responses within a definite time limit</p> <p>Classification I. Clock Based 2. Event Based 3. interactive</p> <p>II ON Time constraints: 1. Hard Real Time 2. Soft-Real time</p> <p>III Classification on Programs                      1. Sequential 2. Multitasking                      3. Real-time</p> <p style="text-align: right;">Explanation</p>	<p>02</p> <p>02</p> <p>02</p> <p>02</p>	10
2.	<p><sup>Continuous</sup> Batch Processing:</p> <ul style="list-style-type: none"> <li>* Production is maintained for long period.</li> <li>* Product composition changed from time to time</li> <li>* output of plant is of low level within the product tolerance.</li> <li>* Changes should be made quickly and smoothly.</li> </ul> <p>Batch Processing: + Sequence of operation carried out to produce a quantity of a product + composition changed between process + setup time</p>	<p>3-5</p> <p>3-5</p>	10

Staff  


Scheme of Valuation -

  
 HOD

Question No.	Details of the Answer	Marks Distribution	Total Marks
	<p>Parameter adjustment</p>  <p>Fig (a)</p> <p>Adjustment Mechanism</p> <p>Auxiliary Measurement</p> <p>controller</p> <p>Process</p> <p>controlled o/p.</p>	02	10M
	<p>Fig (b)</p> <p>Parameter adjustment</p>  <p>Adjustment Mechanism</p> <p>Disturbances</p> <p>controller</p> <p>Process</p> <p>controlled o/p.</p>	02	
	<p>Fig (c) Self Tuning Adaptive control</p>  <p>Parameter adjustment</p> <p>Parameter Estimator</p> <p>controller</p> <p>Process</p> <p>Manipulated Variable</p> <p>controlled output</p>	03	
	<p>Fig (d) Model reference Adaptive</p>  <p>Reference model</p> <p>Adaptation Mechanism</p> <p>Disturbances</p> <p>Set Point</p> <p>Controller</p> <p>Process</p> <p>with explanation</p>	03	

Question No.	Details of the Answer	Marks Distribution	Total Marks
7	<p>Supervisory control System.</p> 	5M 5M	
8	<p>Single chip computer</p> 	10M Fig 5M Explanation - 5M	10M











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## DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

### CIRCULAR

RefNo: CEC/ISE/DAC/ACY2023-2024/02

Date: 10-03-2024

This is to inform the members of Department Advisory Committee that meeting is scheduled on 14-03-2024 at 10: 00 AM in ISE department at Lab C001.

#### Agenda:

- Conduct an orientation for 4<sup>th</sup> semester students
- Planning of Internships for 6<sup>th</sup> semester students
- Involving students in technical activities
- Conducting workshop/seminar/guest lectures

**Mr. Sakthivel B**  
**HOD & Convener**



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## DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

### Department Advisory Committee Meeting

**Date:** 15/03/2024

**Time:** 10:00 AM

**Venue:** Room No. C001

DAC Members Present:

Sl. No	Member Name	Designation	Role
1	Mr. Sakthivel B	HOD	Convenor
2	Mr. Nandish AC	Assistant Professor	Co-Convenor
3	Mrs. Mirudhula R	Assistant Professor	Member
4	Mr. Mr. V John Peter	Assistant Professor	Member
5	Mr. Rajeshwar V Chattarki	C.E O of G K Robotek.	(Industry Expert)
6	Ms. Deepika R	SAP functional consultant, Exikon Technology Private Limited	Alumni

The Department Advisory Committee meeting was conducted at Department of ISE, on 14<sup>th</sup> March, 2024, at 10 AM.

#### Agenda of the Meeting:

- Conduct an orientation for 4<sup>th</sup> semester students
- Planning of Internships for 6<sup>th</sup> semester students
- Involving students in technical activities
- Societal Projects for UG students.
- Conducting workshop/seminar/guest lectures.



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## Minutes of Meeting:

During the Department Advisory Committee meeting, an overview of the department was provided, showcasing student achievement, and faculty accomplishments and contributions. The members discussed suggestions for improvement and reviewed the meeting agenda.

The following points were discussed in the meeting:

- Committee members suggested establishing MOUs with various IT industries to provide students with internship opportunities.
- It was proposed to conduct a technical symposium with increased student participation.
- The committee decided to organize guest lecture, industry visit, and workshop for students in the 3rd, 5th, and 7th semesters.
- It was discussed to conduct an orientation for third-semester students to raise awareness about the 22-Scheme curriculum, particularly regarding registration for NSS, Yoga, or Physical Education.
- The HOD emphasized the importance of societal projects and the need to find opportunities for such initiatives.

**Mr. Sakthivel B**  
**HOD & Convener**



# CITY ENGINEERING COLLEGE, BENGALURU-560061.

## Department of Information Science and Engineering

### ACADEMIC CALENDAR 2023-24 (EVEN SEM)

DAY	FEB 2024		MARCH 2024		APRIL 2024		MAY 2024		JUNE 2024		JULY 2024		AUGUST 2024	
	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT
MON					1	1 <sup>st</sup> to 25 <sup>th</sup> April 24 – Theory Examination – Vth Sem					1	1 <sup>st</sup> to 11 <sup>th</sup> July 24 Practical Exam II Sem B. E		
TUE					2						2	2 <sup>nd</sup> to 4 <sup>th</sup> July 24 Test I – IV Sem B. E		
WED					3		1	Holiday – May Day		VI Sem - Display of 1st IA Marks on NB and ERP Communication to parents	3	3 <sup>rd</sup> to 5 <sup>th</sup> July 24, II Test for VI Semester		
THU	1				4		2	Sports Day			4			1
FRI	2		1		5		3	Sports Day			5			2
SAT	3	1st Saturday Holiday	2	1st Saturday Holiday	6	1st Saturday Holiday	4	1st Saturday Holiday	1	1st Saturday Holiday	6	1st Saturday Holiday	3	1st Saturday Holiday
SUN	4		3		7		5		2		7			4
MON	5		4		8		6		3	3 <sup>rd</sup> June to 20 <sup>th</sup> June 2024 Theory Examination of I Sem MBA/MCA/M. Tech	8			5
TUE	6		5	5 <sup>th</sup> , 6 <sup>th</sup> , 7 <sup>th</sup> Mar 24 Test 2- III Sem, Test 3-V SEM	9	Holiday – Chandramana Ugadi	7	7 <sup>th</sup> May 24, 3 <sup>rd</sup> Test VIII Semester B. E	4		9			6
WED	7		6	Commencement of Classes of II Sem B. E	10		8	Ethnic Day	5		10	IV Semester - Display of 1st Test IA Marks on NB and ERP Communication to parents	7	
THU	8		7		11	Holiday – Qutub-e-Ramzan	9	College Day	6		11	VI Sem - Display of 2 <sup>nd</sup> IA Marks on NB and ERP Communication to parents	8	
FRI	9		8	Holiday -Maha Shiva Ratri	12		10	Holiday – Basava Jayanthi	7		12			9
SAT	10		9	Last Working Day of classes III Sem B. E	13	Alumni Meet	11	Last Working Day of the Semester VIII Sem B. E And Farewell for VIII Semester Students	8		13			10
SUN	11		10		14		12		9		14			11
MON	12	Commencement of Classes of I Sem MBA/MCA/M.Tech and VIII Sem B. E	11		15		13	13 <sup>th</sup> to 21 <sup>st</sup> May 24 Theory Examinations – VIII Sem B.E	10		15	15 <sup>th</sup> July to 10 <sup>th</sup> Aug 24- Theory Exam- II Sem B. E		12
TUE	13	Industrial Visit – 8 <sup>th</sup> Sem (CS/IS/AIIML), B.E	12		16	16 <sup>th</sup> to 18 <sup>th</sup> April 24, I-Test IInd Semester	14		11		16			13
WED	14		13	13 <sup>th</sup> to 27 <sup>th</sup> Mar 24 Theory Examination -III Sem B. E	17		15		12		17	Holiday - Muharram		14
THU	15		14		18		16		13		18			15
FRI	16		15		19	MBA/MCA/M.Tech Industrial Visit	17		14		19			16
SAT	17	3rd Saturday Holiday	16	3rd Saturday Holiday Last Working Day of classes V Sem B. E	20	3rd Saturday Holiday	18	3rd Saturday Holiday	15	3rd Saturday Holiday	20	3rd Saturday Holiday	17	3rd Saturday Holiday
SUN	18		17		21		19		16		21			18
MON	19	Industrial Visit – 5 <sup>th</sup> Sem (CS/IS/AIIML), B. E	18		22		20	Commencement of classes of IV Semester B. E	17	Holiday - Bakrid	22			19
TUE	20		19		23		21	III Test MBA/MCA/M.Tech	18	18 <sup>th</sup> to 20 <sup>th</sup> June 24, II-Test IInd Semester	23			20
WED	21		20	20 <sup>th</sup> to 30 <sup>th</sup> Mar 24 Practical Examination – Vth Sem B. E	24	Display of 1st Test IA Marks on NB and ERP Communication to parents	22		19		24			21
THU	22		21		25	25 <sup>th</sup> to 27 <sup>th</sup> April 24, II Test MBA/MCA/M.Tech and 25 <sup>th</sup> April VIII Semester B. E	23	23 <sup>rd</sup> to 30 <sup>th</sup> May 24, Internship Viva-voce/Project Viva- VIII Semester	20		25			22
FRI	23	23 <sup>rd</sup> Feb to 5 <sup>th</sup> Mar 2024 Practical Exam B.E I Sem B. E	22		26	“Battle of Science” for IInd Sem Students	24		21		26			23
SAT	24		23	“Talents Day” for IInd Sem Students	27		25	Last Working Day of I Sem MBA/MCA/M. Tech	22	Graduation Day	27			24

SUN	25		24		28		26		23		28		25	
MON	26		25	25 <sup>th</sup> to 27 <sup>th</sup> March 24, I Test MBA/MCA/M.Tech and 25 <sup>th</sup> March VIII Semester B. E	29	Commencement of Classes of VI Semester B. E	27	27 <sup>th</sup> to 31 <sup>st</sup> May 24 Practical Examination/Internship Viva Voce/Project Viva of I Sem MCA/ M. Tech	24		29		26	Display of 2 <sup>nd</sup> Test IA Marks on NB and ERP Communication to parents
TUE	27		26		30		28	28 <sup>th</sup> to 30 <sup>th</sup> MAY 24, I Test for VI Semester	25	Commencement of Classes of II Sem MBA/MCA/M.Tech	30	International Conference	27	
WED	28		27				29		26	Display of IInd IA Marks on NB and ERP Communication to parents	31	International Conference	28	
THU	29		28				30		27				29	
FRI			29	Holiday – Good Friday			31		28	PTM – IInd Semester			30	PTM – IVth Semester
SAT			30	30 <sup>th</sup> Mar to 12 <sup>th</sup> April 24, Practical Examination – III Sem B. E					29	Last Working Day of The II Semester B. E			31	Last Working Day of the semester IV Semester
SUN			31						30					

Note: 1. Students Feedback should be taken immediately after the Test. 2. There will be no additional circular will be sent for dates mentioned for Events in CoE



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Academic Year: 2023-24 / Even Sem

## DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

### COURSE PREFERNCE

Name of the Faculty: Mrs. Vani

Designation: Assistant Professor

Year / Semester: II, IV/III, VI

Sl. No	Course Code and Name	Year/Semester
1	HSMC 21CS61: Software Engineering and Project Management	III/ VI
2	21IS643: Data Mining and Data warehousing	III/ VI
3	BCS401: Analysis & Design of Algorithms	II/IV
4	PCC 21IS63 : Software Testing	III/ VI
5	21CS651: Introduction to Data Structures	III/ VI
6	BIS402: Advanced Java	II/IV

Signature of faculty



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Academic Year: 2023-24 / Even Sem

## DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

### COURSE PREFERNCE

Name of the Faculty: Mr. Nandish A C

Designation: Assistant Professor

Year / Semester: II, IV/III, VI

Sl. No	Course Code and Name	Year/Semester
1	PCC 21IS63 : Software Testing	III/ VI
2	IPCC 21CS62: Full stack Development	III/ VI
3	BCS401: Analysis & Design of Algorithms	II/IV
4	BCS403: Database Management Systems	II/IV
5	PCC 21IS63 : Software Testing	III/ VI
6	BCS456A: Green IT and Sustainability	II/IV

Signature of faculty



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Academic Year: 2023-24 / Even Sem

## DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

### COURSE ALLOCATION

Sl.No	Name of the Faculty	Course Code and Name	Year/ Semester	Signature
1	Mr. B. Sakthivel	HSMC 21CS61: Software Engg & Project management	III/ VI	
2	Mr. Nandish A C	BCS403: Database Management Systems	II/IV	
3	Mrs. Anita Patil	IPCC 21CS62: Full stack Development BCS402: MICROCONTROLLERS	III/ VI II/IV	
4	Mrs. Nayana R K	BPLCK205B: Introduction to Python Programming	I/ II	
5	Mrs. Vani	BCS401: Analysis & Design of Algorithms 21IS643: Data Mining and Data warehousing	II/ IV III/VI	
6	Mrs. R. Mirudhula	MP 1ISMP67: Mini Project BCS456A: Green IT and Sustainability	III/VI	
7	Mr. V. John Peter	18CS822: Storage Area Networks	IV/ VIII	
8	Mr. M Mathivanan	PCC 21IS63: Software Testing	III/VI	
9	Mrs. Hemalatha D	BUHK408: Universal human values course	II/ IV	
10	Mrs. Nayana H J	BECKT205H: Internet Of Things	I/ II	

HOD, ISE





**CITY ENGINEERING COLLEGE**  
**BRANCH: INFORMATION SCIENCE & ENGINEERING**  
**TIME TABLE Academic Year – 2023-24**

**SEMESTER: IV**

**ROOM NO: 204**

**Class Teacher: Mrs. Anita Patil**

**W.E.F: 22-04-2024**

DAY	9:00-10:00	10:00-11:00	11:00-11:15	11:15-12:15	12:15-1:15	1:15-2:00	2:00-2:30.00	3:00-4:00	4:00-5:00	
MON	ADA Lab (D1) / AJ Lab (D2) / DBMS Lab(D3)		<b>BREAK</b>	DMS	ADA	<b>LUNCH</b>	GITS	Library	Sports	
TUE	DMS(T)	ADA		ADA Lab (D2) / AJ Lab (D3) / DBMS Lab(D1)			Proctor (D1)/ Proctor (D3)			
WED	Biology	DMS		AJ	DBMS		Proctor(D2)			
THU	DBMS	Biology		ADA	UHV		AJ	DMS(T)		
FRI	ADA Lab (D3) / AJ Lab (D1) / DBMS Lab(D2)			AJ	DBMS		Department Activity			
SAT										
SUBJECT CODE	SUBJECT NAME		FACULTY NAME		SUBJECT CODE	SUBJECT NAME		FACULTY NAME		
BCS401	Analysis & Design of Algorithms		Mrs. Vani		BCSL404	Analysis & Design of Algorithms Lab (C109)		Mr. Vani/ Mr M Mathivanan		
BIS402	Advanced Java		Mr. B Ramesh		BIS402	Advanced Java Lab (C102)		Mr. B Ramesh/ Ms. Harshita		
BCS403	Database Management Systems		Mr. Nandish A C		BCS403	Database Management Systems Lab (C104)		Mr. Nandish A C Mrs. Hemalatha D		
BCS405A	Discrete Mathematical Structures		Mr. Vanita		BNSK459 / BPEK459/ BYOK459	PE/Sports/Yoga		Mr. Rangaswamy Prof. Hemalatha D		
BCS456A	Green IT and Sustainability		Mr. R. Mirudhula							
BBOK407	Biology For Engineers		Mr. Meghana							
BUHK408	Universal human values course		Mr. Hemalatha D							

*Anita Patil*

**Time Table Incharge**

*Almy*

**HOD**

*Skandan*

**PRINCIPAL**



**CITY ENGINEERING COLLEGE**  
**BRANCH: INFORMATION SCIENCE & ENGINEERING**  
**TIME TABLE Academic Year – 2023-24**

SEMESTER: VI

ROOM NO: 304

Class Teacher: Mrs. R. Mirudhula

W.E.F : 29-04-2024

DAY	9:00-10:00	10:00-11:00	11:00-11:15	11:15-12:15	12:15-1:15	1:15-2:00	2:00-2:3.00	3:00-4:00	4:00-5:00
MON	SEPM	REPP	<b>BREAK</b>	FSD	SEPM(T)	<b>LUNCH</b>	Internship		
TUE	ST	FSD		FSD Lab			Mini Project		
WED	DMDW	ST		REPP	DMDW		ST	SEPM(T)	
THU	REPP	SEPM		ST Lab			Proctor	Library	
FRI	Internship			FSD	DMDW		Department Activity		
SAT									
SUBJECT CODE	SUBJECT NAME		FACULTY NAME		SUBJECT CODE	SUBJECT NAME		FACULTY NAME	
HSMC 21CS61	Software Engg & Project management		Dr. B. Sakthivel		PCC 21ISL66	Software Testing Laboratory (C001)		Mr. Mathivanan Mr. V John Peter	
IPCC 21CS62	Full stack Development		Mrs. Anita Patil		IPCC 21CS62	Full stack Development Lab(103)		Mrs. Anita Patil Mrs. R. Mirudhula	
PCC 21IS63	Software Testing		Mr. M Mathivanan		INT21INT68	Internship		Dr. B. Sakthivel	
21IS643	Data Mining and Data warehousing		Mrs. Vani						
21ME652	Renewable Energy Power Plants		Mr. Harshavardhan						
MP IISMP67	Mini Project		Mr. R. Mirudhula						

Time Table Incharge

HOD

PRINCIPAL



**CITY ENGINEERING COLLEGE**  
**BRANCH: INFORMATION SCIENCE & ENGINEERING**  
**TIME TABLE Academic Year – 2023-24**

**SEMESTER: VIII**

**2018 SCHEME**

**CLASS ROOM: C401**

**W.E.F :26-02-2024**

DAY	1	2	TEA	3	4	LUNCH	5	6	7
	9:00-10:00	10:00-11:00	11:00-11:15	11:15-12:15	12:15-1:15	1:15-2:00	2:00-2:30.00	3:00-4:00	4:00-5:00
MON	18CS822	18CS81	<b>B R E A K</b>	18CS822	LIBRARY	<b>L U N C H</b>	MENTOR AND MENTEE INTERACTION		
TUE	18CS81	18CS822		18CS81	LIBRARY		DEPARTMENT ACTIVITY		
WED	18CSP83/18CSI85			18CSP83/18CSI85			LIBRARY		
THU									
FRI									
SAT	18CSS84			18CSS84					

Sl. No	Course Code	Course Name	Faculty Name
1	18CS81	Internet of Things	Mrs. Shruthi B S
2	18CS822	Storage Area Networks	Mr. John Peter
3	18CSP83	Project Work Phase - 2	Mrs. Swetha. A / Mrs. Shruthi B S / Mr. John Peter
4	18CSS84	Technical Seminar	Mrs. Vibhavi R N / Mrs. Spoorthi M
5	18CSI85	Internship	Mr. Girish G A / Mr. Ramesh B

**Time Table Incharge**

**HOD**

**PRINCIPAL**



**CITY ENGINEERING COLLEGE**  
**BRANCH: INFORMATION SCIENCE & ENGINEERING**  
**TIME TABLE Academic Year – 2023-24**

**Staff Name: Mrs. Vani**

**W.E.F: 22-04-2024**

DAY	9:00-10:00	10:00-11:00	11:00-11:15	11:15-12:15	12:15-1:15	1:15-2:00	2:00-2:30.00	3:00-4:00	4:00-5:00
MON	ADA Lab (D1)		<b>BREAK</b>		ADA	<b>LUNCH</b>			
TUE		ADA		ADA Lab (D2)					
WED	DMDW				DMDW				
THU					ADA				
FRI	ADA Lab (D3)						DMDW		
SAT									

**Time Table Incharge**

**HOD**



**CITY ENGINEERING COLLEGE**  
**BRANCH: INFORMATION SCIENCE & ENGINEERING**  
**TIME TABLE Academic Year – 2023-24**

**Staff Name: Mrs. Anita Patil**

**W.E.F: 22-04-2024**

DAY	9:30-10:20	10:20-11:10	11:10-11:30	11:30 -12:20	12:20-1:10	1:10-2:00	2:00-2:50	2:50-3:40	3:40-4:30	
MON		MC	BREAK	FSD		LUNCH				
TUE		FSD		FSD Lab				Proctor (D1)		
WED	MC									
THU		MC								
FRI					FSD					
SAT										

**Time Table Incharge**

**HOD**

**STORAGE AREA NETWORKS**  
**(Effective from the academic year 2018 -2019)**  
**SEMESTER – VII**

<b>Course Code</b>	<b>18CS822</b>	<b>CIE Marks</b>	40
<b>Number of Contact Hours/Week</b>	3:0:0	<b>SEE Marks</b>	60
<b>Total Number of Contact Hours</b>	40	<b>Exam Hours</b>	03
<b>CREDITS –3</b>			
<b>Course Learning Objectives:</b> This course (18CS822) will enable students to:			
<ul style="list-style-type: none"> <li>• Evaluate storage architectures,</li> <li>• Define backup, recovery, disaster recovery, business continuity, and replication</li> <li>• Examine emerging technologies including IP-SAN</li> <li>• Understand logical and physical components of a storage infrastructure</li> <li>• Identify components of managing and monitoring the data center</li> <li>• Define information security and identify different storage virtualization technologies</li> </ul>			
<b>Module 1</b>			<b>Contact Hours</b>
<b>Storage System: Introduction to Information Storage:</b> Information Storage, Evolution of Storage Architecture, Data Center Infrastructure, Virtualization and Cloud Computing. <b>Data Center Environment:</b> Application Database Management System (DBMS), Host (Compute), Connectivity, Storage, Disk Drive Components, Disk Drive Performance, Host Access to Data, Direct-Attached Storage, Storage Design Based on Application <b>Textbook1 : Ch.1.1 to 1.4, Ch.2.1 to 2.10</b> <b>RBT: L1, L2</b>			08
<b>Module 2</b>			
<b>Data Protection - RAID :</b> RAID Implementation Methods, RAID Array Components, RAID Techniques, RAID Levels, RAID Impact on Disk Performance, RAID Comparison. <b>Intelligent Storage Systems :</b> Components of an Intelligent Storage System, Types of Intelligent Storage Systems. <b>Fibre Channel Storage Area Networks - Fibre Channel:</b> Overview, The SAN and Its Evolution, Components of FC SAN. <b>Textbook1 : Ch.3.1 to 3.6, Ch. 4.1, 4.3, Ch. 5.1 to 5.3</b> <b>RBT: L1, L2</b>			08
<b>Module 3</b>			
<b>IP SAN and FCoE: iSCSI, FCIP, Network-Attached Storage:</b> General-Purpose Servers versus NAS Devices. Benefits of NAS. File Systems and Network File Sharing, Components of NAS. NAS I/O Operation, NAS Implementations, NAS File-Sharing Protocols, Factors Affecting NAS Performance <b>Textbook1 : Ch.6.1, 6.2, Ch. 7.1 to 7.8</b> <b>RBT: L1, L2</b>			08
<b>Module 4</b>			
<b>Introduction to Business Continuity:</b> Information Availability, BC Terminology, BC Planning Life Cycle, Failure Analysis, Business Impact Analysis, BC Technology Solutions, <b>Backup and Archive:</b> Backup Purpose, Backup Considerations, Backup Granularity, Recovery Considerations, Backup Methods, Backup Architecture, Backup and Restore Operations, Backup Topologies, Backup in NAS Environments <b>Textbook1 : Ch.9.1 to 9.6, Ch. 10.1 to 10.9</b> <b>RBT: L1, L2</b>			08
<b>Module 5</b>			
<b>Local Replication:</b> Replication Terminology, Uses of Local Replicas, Replica Consistency , Local Replication Technologies, Tracking Changes to Source and Replica, Restore and Restart Considerations, Creating Multiple Replicas. <b>Remote Replication:</b> Modes of Remote			08

Replication, Remote Replication Technologies. <b>Securing the Storage Infrastructure:</b> Information Security Framework, Risk Triad, Storage Security Domains. Security Implementations in Storage Networking <b>Textbook1 : Ch.11.1 to 11.7, Ch. 12.1, 12.2, Ch. 14.1 to 14.4</b> <b>RBT: L1, L2</b>	
<b>Course Outcomes:</b> The student will be able to :	
<ul style="list-style-type: none"> <li>• Identify key challenges in managing information and analyze different storage networking technologies and virtualization</li> <li>• Explain components and the implementation of NAS</li> <li>• Describe CAS architecture and types of archives and forms of virtualization</li> <li>• Illustrate the storage infrastructure and management activities</li> </ul>	
<b>Question Paper Pattern:</b>	
<ul style="list-style-type: none"> <li>• The question paper will have ten questions.</li> <li>• Each full Question consisting of 20 marks</li> <li>• There will be 2 full questions (with a maximum of four sub questions) from each module.</li> <li>• Each full question will have sub questions covering all the topics under a module.</li> <li>• The students will have to answer 5 full questions, selecting one full question from each module.</li> </ul>	
<b>Textbooks:</b>	
1. EMC Education Services, " <b>Information Storage and Management</b> ", Wiley India Publications, 2009. ISBN: 9781118094839	
<b>Reference Books:</b>	
1. Paul Massiglia, Richard Barker, " <b>Storage Area Network Essentials: A Complete Guide to Understanding and Implementating SANs Paperback</b> ", 1st Edition, Wiley India Publications, 2008	



**DEPARTMENT OF ISE**

**LESSON PLAN FOR EVEN SEMESTER FOR ACADEMIC YEAR 2023-2024**

Course Title: <b>STORAGE AREA NETWORKS</b>	Course Code: 18CS822
Total contact hours: 3:0:0	End Term Marks :60
Internal Marks: 40	
Semester: VIII sem A & B section	Academic year: 2023-2024
Lesson plan Author: <b>JOHN PETER V</b>	Date: 07-02-2024

**Course Learning Objectives:**

This course (18CS822) will enable students to:

1. Evaluate storage architectures,
2. Define backup, recovery, disaster recovery, business continuity, and replication
3. Examine emerging technologies including IP-SAN
4. Understand logical and physical components of a storage infrastructure
5. Identify components of managing and monitoring the data center
6. Define information security and identify different storage virtualization technologies

**Course Outcomes:**

The student will be able to :

1. Identify key challenges in managing information and analyze different storage networking technologies and virtualization
2. Understanding data protection.
3. Explain components and the implementation of NAS
4. Describe CAS architecture and types of archives and forms of virtualization
5. Illustrate the storage infrastructure and management activities

**Module 1**

<u>Week</u>	<u>Contents of Module</u>	<u>Bloom's Taxonomy Level</u>	<u>Course Outcome (CO)</u>
1	Storage System: Introduction to Information Storage	L1, L2 ,L3	CO-1
	Evolution of Storage Architecture, Data Center Infrastructure		
	Virtualization and Cloud Computing		
2	<b>Data Center Environment:</b> Application Database	L1, L2 ,L3	CO-1



	Management System (DBMS)		
	Host (Compute), Connectivity, Storage, Disk Drive Components, Disk Drive Performance		
	Host Access to Data, Direct-Attached Storage, Storage Design Based on Application		

### Module 2

<u>Week</u>	<u>Contents of Module</u>	<u>Bloom's Taxonomy Level</u>	<u>Course Outcome (CO)</u>
3	Data Protection -RAID : RAID Implementation Methods	L1, L2 ,L3	CO-2
	RAID Array Components, RAID Techniques, RAID Levels		
	RAID Impact on Disk Performance, RAID Comparison.		
4	Intelligent Storage Systems	L1, L2 ,L3	CO-2
	Components of an Intelligent Storage System		
	Types of Intelligent Storage Systems		
5	Fibre Channel Storage Area Networks	L1, L2 ,L3	CO-2
	Fibre Channel: Overview		
	The SAN and Its Evolution, Components of FC SAN.		

### Module 3

<u>Week</u>	<u>Contents of Module</u>	<u>Bloom's Taxonomy Level</u>	<u>Course Outcome (CO)</u>
6	IP SAN and FCoE: iSCSI, FCIP	L1, L2 ,L3	CO-3
	Network-Attached Storage: General-Purpose Servers versus NAS Devices, Benefits of NAS		
	File Systems and Network File Sharing, Components of NAS.		
7	NAS I/O Operation, NAS Implementations	L1, L2 ,L3	CO-3
	NAS File-Sharing Protocols		
	Factors Affecting NAS Performance		

### Module 4

<u>Week</u>	<u>Contents of Module</u>	<u>Bloom's Taxonomy Level</u>	<u>Course Outcome (CO)</u>
8	<b>Introduction to Business Continuity:</b> Information Availability, BC Terminology	L1, L2 ,L3	CO-4
	BC Planning Life Cycle, Failure Analysis, Business Impact Analysis		
	BC Technology Solutions		
9	<b>Backup and Archive:</b> Backup Purpose	L1, L2 ,L3	CO-4
	Backup Considerations, Backup Granularity		
	Recovery Considerations.		
10	Backup Methods, Backup Architecture	L1, L2 ,L3	CO-4
	Backup and Restore Operations, Backup Topologies		
	Backup in NAS Environments		

### Module 5

<u>Week</u>	<u>Contents of Module</u>	<u>Bloom's Taxonomy Level</u>	<u>Course Outcome (CO)</u>
11	Local Replication: Replication Terminology, Uses of Local Replicas, Replica Consistency	L1, L2 ,L3	CO-5
	Local Replication Technologies, Tracking Changes to Source and Replica		
	Restore and Restart Considerations, Creating Multiple Replicas.		
12	Remote Replication	L1, L2 ,L3	CO-5
	Modes of Remote Replication		
	Remote Replication Technologies.		
13	<b>Securing the Storage Infrastructure:</b> Information Security Framework	L1, L2 ,L3	CO-5
	Risk Triad, Storage Security Domains		
	Security Implementations in Storage Networking		

#### **RBT Level**

L1-Remembering L2-Understanding L3-Applying L4-Analysing L5-Evaluating L6-Creating

**Textbooks:**

1. EMC Education Services, "**Information Storage and Management**", Wiley India Publications, 2009. ISBN: 9781118094839

**Reference Books:**

1. Paul Massiglia, Richard Barker, "**Storage Area Network Essentials: A Complete Guide to Understanding and Implementating SANs Paperback**", 1st Edition, Wiley India Publications, 2008



**Signature of Faculty**



**Signature of HOD**

**CITY ENGINEERING COLLEGE**  
**DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING**  
**LESSON PLAN 2023-2024**

**SUBJECT: STORAGE AREA NETWORKS**

**FACULTY NAME: Prof. JOHN PETER V**  
**SEM: 8<sup>th</sup>**

**SUBJECT CODE:18CS822**

Week	Date		Topics Planned
	From	To	
I	12/2/2024	18/2/2024	<b>Module 1</b> <b>Storage System: Introduction to Information Storage:</b> Information Storage, Evolution of Storage Architecture, Data Center Infrastructure, Virtualization and Cloud Computing.
II	19/2/2024	25/2/2024	<b>Data Center Environment:</b> Application Database Management System (DBMS), Host (Compute), Connectivity, Storage, Disk Drive Components, Disk Drive Performance, Host Access to Data, Direct-Attached Storage, Storage Design Based on Application
III	27/2/2024	2/3/2024	<b>Module 2</b> Data Protection - RAID : RAID Implementation Methods, RAID Array Components, RAID Techniques, RAID Levels, RAID Impact on Disk Performance, RAID Comparison.
IV	5/3/2024	9/3/2024	<b>Intelligent Storage Systems :</b> Components of an Intelligent Storage System, Types of Intelligent Storage Systems.
V	12/3/2024	16/3/2024	<b>Fibre Channel Storage Area Networks - Fibre Channel:</b> Overview, The SAN and Its Evolution, Components of FC SAN.
VI	18/3/2024	23/3/2024	<b>Module 3</b> <b>IP SAN and FCoE:</b> iSCSI, FCIP, <b>Network-Attached Storage:</b> General-Purpose Servers versus NAS Devices, Benefits of NAS, File Systems and Network File Sharing, Components of NAS.
VII	25/3/2024	30/3/2024	NAS I/O Operation, NAS Implementations, NAS File-Sharing Protocols, Factors Affecting NAS Performance
VIII	1/4/2024	6/4/2024	<b>Module 4</b> <b>Introduction to Business Continuity:</b> Information Availability, BC Terminology, BC Planning Life Cycle, Failure Analysis, Business Impact Analysis, BC Technology Solutions .
IX	8/4/2024	13/4/2024	<b>Backup and Archive:</b> Backup Purpose, Backup Considerations, Backup Granularity, Recovery Considerations.

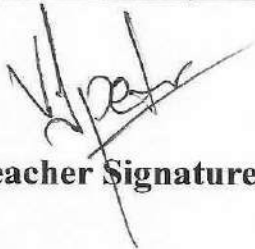
**CITY ENGINEERING COLLEGE**  
**DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING**  
**LESSON PLAN 2023-2024**

**SUBJECT: STORAGE AREA NETWORKS**

**FACULTY NAME: Prof. JOHN PETER V**  
**SEM: 8<sup>th</sup>**

**SUBJECT CODE:18CS822**  
**SEC: A,B**

Week	Date		Topics Planned
	From	To	
X	15/4/2024	20/4/2024	Backup Methods, Backup Architecture, Backup and Restore Operations, Backup Topologies, Backup in NAS Environments
XI	22/4/2024	27/4/2024	<b>Module 5</b> <b>Local Replication:</b> Replication Terminology, Uses of Local Replicas, Replica Consistency, Local Replication Technologies, Tracking Changes to Source and Replica, Restore and Restart Considerations, Creating Multiple Replicas.
XII	29/4/2024	4/5/2024	<b>Remote Replication:</b> Modes of Remote Replication, Remote Replication Technologies.
XIII	6/5/2024	11/5/2024	<b>Securing the Storage Infrastructure:</b> Information Security Framework, Risk Triad, Storage Security Domains. Security Implementations in Storage Networking



**Teacher Signature**



**HOD Signature**

# City Engineering College

Department of Information Science and Engineering

Subject Name: Storage Area Networks

Subject Code	18CS822	SEMESTER	VIII
Name of the Faculty	John Peter V	Academic Year	2023-24

## Question Bank

### Module 1

1.	What is data center? Explain elements of data center with a neat diagram.	9
2.	Discuss the functions of logical volume manager with a neat diagram	8
3.	Write short notes on i) virtualization ii) cloud computing	9
4.	Explain the concept of compute virtualization along with its advantages with a neat diagram.	8
5.	What is a file system? Explain process of mapping users file to disk storage with the help of neat diagram	10
6.	Discuss features of connectivity.	9
7.	Explain different types of data	8
8.	Explain data center environments	6
9.	Explain the Process of mapping user files to disk storage	8
10.	Write a short note on compute virtualization	10
11.	Explain the various interface protocols	9
12.	Describe the various disk drive components	9
13.	What is zoning? explain	7

### Module 2:

1.	Explain evolution of SAN. What is RAID? Explain the RAID levels with reference to RAID 0, RAID 1, nested RAID, RAID 3, RAID 4 ,RAID 5, RAID 6 with a neat diagram.	9
2.	With a neat diagram explain the components of an intelligent storage system.	8
3.	Consider an application that generates 5200 IOPS with 60% of them being read, calculate the IOPS requirement for RAID5 and RAID1. If application uses 180 IOPS, calculate the number of disk required.	9
4.	With a neat diagram, explain the structure of read and write operations with cache.	8
5.	Write a short note on cache management	7
6.	Explain the components of FC SAN.	10
7.	Compare the various RAID levels	6
8.	Write a short note on cache management technique	10
9.	Explain the types of intelligent storage system	9
10.	Explain the evolution of SAN systems	10

### Module 3 :

1.	What is iSCSI? Explain the protocol stack with a neat diagram	9
2.	Explain NAS file sharing protocols.	8
3.	What are the components of a NAS? Explain Input Output operations.	9

4.	Explain the different layers of FC protocol stack with a neat diagram.	8
5.	Explain the factors effecting NAS performance	10
6.	Explain iSCSI topologies.	8
7.	Explain FCIP	6
8.	Discuss on FCIP performance and security	9
9.	Write a short on File Systems and Network File Sharing	8
10.	Explain various NAS implementations	8
11.	Discuss various NAS file sharing protocols	9

#### Module 4:

1.	What is information availability? Explain how IA is defined and measured	
2.	Explain single point failure and resolving the same	
3.	Define i) Disaster Recovery ii) Data vault iii) cold site iv) Hot site V) Disaster Restart vi) server clustering vii) RTO viii) RPO	
4.	Explain back-up granularity with relevant diagrams.	
5.	Explain backup and restore operations with diagrams.	
6.	Explain Business Continuity planning life cycle	
7.	What are the causes of information unavailability	
8.	Explain business impact analysis	
9.	Discuss BC technology solutions	
10.	Explain back up architecture	

#### Module 5 :

1.	Explain how consistency is maintained in Replicated Databases and Replicated File System.	8
2.	What are the various local replication technologies? Explain any one in detail.	9
3.	Explain FC SAN security architecture.	8
4.	What are the various Remote replication technologies? Explain any one in detail.	7
5.	Explain Authentication and Authorization wrt NAS File Sharing.	8
6.	Explain CHAP in detail	9
7.	What are the various Storage Security Domains? Explain any two in detail	8
8.	Explain the two techniques of storage Array based remote replication	7
9.	What are the various security goals of an Information security framework?	8
10.	Explain the replication terminology and uses of local replica.	9
11.	Compare the various local replication technologies.	10
12.	How do we track changes to source and replica?	8

# 18CS822 - STORAGE AREA NETWORKS

## Assignment 1

1. Explain the evolution of Storage Architecture.
2. Show the core elements and key characteristics of the Data Center with neat diagram
3. Explain the various factors of Disk Drive Performance.  
Disk Service Time: Seek Time, Rotational Latency.
4. Data Transfer Rate , Disk I/O Controller Utilization
5. Explain the components of Disk Drive  
Platter, Spindle, Read/Write Head.
6. Actuator Arm Assembly, Drive Controller Board, Physical Disk Structure
7. Illustrate the popular interface protocols used between the host and storage  
Communication
8. Explain the components and Types of Intelligent Storage Systems
9. Explain read and write cache operation with a diagram
10. Explain the RAID techniques with suitable diagrams  
Striping, Mirroring, Parity with diagrams
11. List out Comparisons between different RAID levels
12. Differentiate between RAID 5, RAID 6, RAID 0 + 1, RAID 1+0 WRT reading performance, write performance and protection.

## Assignment 2

1. Explain the components of Fibre Channel SAN Node Ports, Cables and Connectors, Interconnect Devices, SAN Management Software
2. Define NAS. List the benefits of NAS. Explain different NAS implementations in detail.
3. Discuss the factors affecting NAS performance and Explain the components of NAS
4. Define iSCSI and its components
5. Explain iSCSI Protocol Stack and iSCSI PDU
6. Compare general-purpose servers with NAS Devices with an illustration
7. Discuss NAS File sharing protocols
8. Define FCIP, Explain FCIP Protocol Stack
9. Explain Backup architecture with backup and restore operations
10. Discuss different backup Topologies.



### **Assignment 3**

1. Explain BC Terminology in detail
2. Explain fault tolerance mechanisms OR Failure Analysis
3. What is Business Continuity? Explain BC Planning Life Cycle with a neat diagram.
4. Write a note on risk trade. Explain in detail.
5. Write short notes on Kerberos and the authentication process in Kerberos
6. Explain Storage array-based local replication with a diagram
7. Explain Local replication Technologies and their uses
8. Explain different modes of remote replication and remote replication Technologies
9. Explain Security threats in application access domains and Explain Security implementation in Storage Networking

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1	C	E							
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COURSECODE:18CS822

## CITYENGINEERINGCOLLEGE

KanakapuraRoad,Doddakallasandra,Bengaluru-560062

## FIRST INTERNAL TEST

Programme:CS/IS

Course Name:Storage Area Networks

Sem:VIII A&amp;B

Duration:1½Hrs

Date:26/03/2024

Time:2:30PM-4:00PM

MAX MARKS:50

*Note: Answer any FIVE questions choosing at least ONE from each part*

## Part - A

			CO'S	BT'S
1.	Define Data center. List and explain the key elements of data center. Explain the characteristics of data center elements with diagram.	10	CO1	BT1
<i>OR</i>				
2.	A) Explain with neat diagram the Evolution of Storage architecture. B) With diagram Explain about Compute Virtualization.	6 4	CO2	BT1

## Part - B

3.	Explain in detail disk drive components with suitable diagram.	10	CO1	BT1, BT2
<i>OR</i>				
4.	Discuss Disk service time & Disk I/O controller utilization	10	CO1	BT1, BT3

## Part - C

5.	What is a File system? Explain the process of mapping user files to disk storage.	10	CO2	BT1, BT2
<i>OR</i>				
6.	A) Difference between software and hardware RAID. B) With diagram Explain different RAID techniques.	4 6	CO2	BT2, BT3

## Part - D

7.	List the different RAID levels where parity technique be adopted. Explain any three in detail.	10	CO2	BT2, BT3
<i>OR</i>				
8.	Explain types of intelligent storage systems.	10	CO2	BT1, B2

## Part - E

9.	Explain the components of Intelligent storage system.	10	CO2	BT2, BT3
<i>OR</i>				
10.	Explain the components of fibre channel storage area networks.	10	CO2	BT3, BT4

**Blooms Taxonomy Levels (BTL):**

BT1- Remembering the concepts BT2- Understanding BT3 -Applying BT4 -Analyzing BT5-Evaluating

**Course Outcomes (CO's):**

CO1: Understand the techniques and summarize the concepts

CO2: Investigate the concepts and apply the same

# CITY ENGINEERING COLLEGE

DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

SCHEME FOR EVALUATION

CIE TEST I

SEMESTER & SECTION: 08 - A & B.

DATE: 26-03-2024

Q. No	Details of the Answer	Marks Distribution	Total marks
1.	Data Center Definition Elements of data Center. Characteristics of data Center Diagram.	① 4 3 2	} 10.
2.	A, Evaluation of Storage Architecture 1, Server Centric 2, Storage Centric Diagram. - Architecture B, Compute Virtualization Explanation Diagram	4. 2 3 1	} 6 } 4
3.	Disk Drive Components. Diagram of HDD. Platter Explanation with diagram. Spindle, Read write head Actuators → Explanation with diagram.	3 3 4	} 10

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4. Disk Service time.

Seek time

Rotational Latency.

Data transfer Rate

Disk I/O Controller utilization

Queue.

Disk I/O Controller.

Diagram for utilization

5. File System. Definition.

Common file system types.

Storage sub system with LVM.

Process of mapping user files to disk

Storage with diagram

Journaled & Nonjournaling file system

6. A. Hardware RAID } Explanations  
Software RAID }

B. RAID techniques -

1. Striping.

2. Mirroring

3. Parity

5  
10

2  
1  
2  
3  
10  
2

2  
+  
2 } 4

2  
2  
2 } 6

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# CITY ENGINEERING COLLEGE

DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

SCHEME FOR EVALUATION

CIE TEST I

SEMESTER & SECTION: 08 & A & B

DATE: 26.03.2024

Q. No	Details of the Answer	Marks Distribution	Total marks
7.	<p>RAID Levels. Brief description with parity technique.</p> <p>Any three RAID levels with diagrammatic explanation.</p>	<p>4.</p> <p>2+2+2 =6</p>	<p>10</p>
8.	<p>Intelligent Storage System.</p> <p>Types.</p> <p>Components.</p> <p>Implementation Cache with diagram.</p>	<p>4</p> <p>2</p> <p>4</p>	<p>10</p>
9.	<p>Components of Intelligent Storage System.</p> <p>Architecture diagram</p> <p>Components with brief Explanations</p>	<p>4.</p> <p>6</p>	<p>10</p>

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10.

### Component of Fc SAN

- i Node ports.
  - ii Cables & Connectors
  - iii Inter Connecting devices.
  - iv SAN Management Software.
- Diagram's

2

2

2

2

2

10

USN I C E

COURSECODE:18CS822

## CITYENGINEERINGCOLLEGE

KanakapuraRoad,Doddakallasandra,Bengaluru-560062

## SECOND INTERNAL TEST

Programme:CS/IS

Date:18/04/2024

Course Name:Storage Area Networks

Time:2:30PM-4:00PM

Sem:VIII A&amp;B

Duration:1½Hrs

MAX MARKS:50

*Note: Answer any FIVE questions choosing at least ONE from each part*

## Part -A

		CO'S	BT'S
1.	Discuss different iSCSI topologies with neat diagram.	10	CO1 BT1
<i>OR</i>			
2.	Briefly Explain about iSCSI protocol stack	10	CO2 BT1

## Part - B

3.	Explain the components of NAS with neat sketch. Briefly explain the benefits of NAS	10	CO1 BT1,BT2
<i>OR</i>			
4.	What is NAS? Explain NAS implementations in detail.	10	CO1 BT1,BT3

## Part-C

5.	With diagram Explain about FCIP protocol stack and FCIP topology.	10	CO2 BT1,BT2
<i>OR</i>			
6.	Discuss about NAS file sharing protocols.	10	CO1 BT2,BT3

## Part-D

7.	With a neat diagram Explain Gateway network attached storage connectivity.	10	CO1 BT2,BT3
<i>OR</i>			
8.	a)What is Business continuity? Explain the BC terminologies in detail. b)Define the following terminologies. i,MTBF ii,MTTR	7 3	CO2 BT1,B2

## Part-E

9.	a)Describe Failure analysis in BC. Mention important BC Solutions. b)Explain Single point of failure how to mitigate single point of failure.	3 7	CO2 BT2,BT3
<i>OR</i>			
10.	Discuss the life cycle of BC planning.	10	CO1 BT3,BT4

**Blooms Taxonomy Levels(BTL):**

BT1- Remembering the concepts BT2-Understanding BT3 -Applying BT4 -Analyzing BT5-Evaluating

**Course Outcomes(CO's):**

CO1:Understand the techniques and summarize the concepts

CO2: Investigate the concepts and apply the same

# CITY ENGINEERING COLLEGE

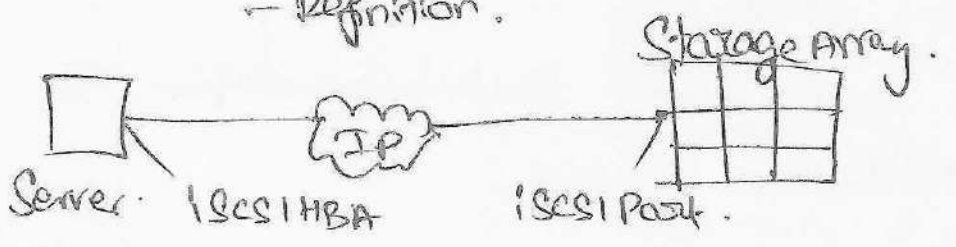
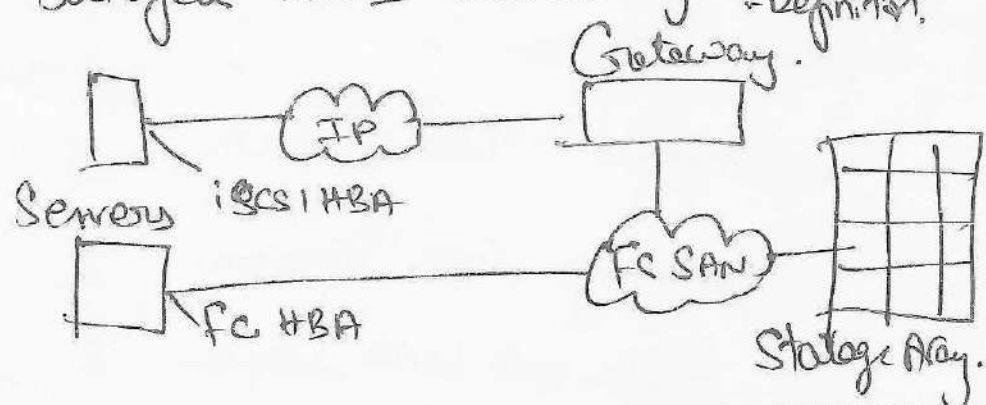
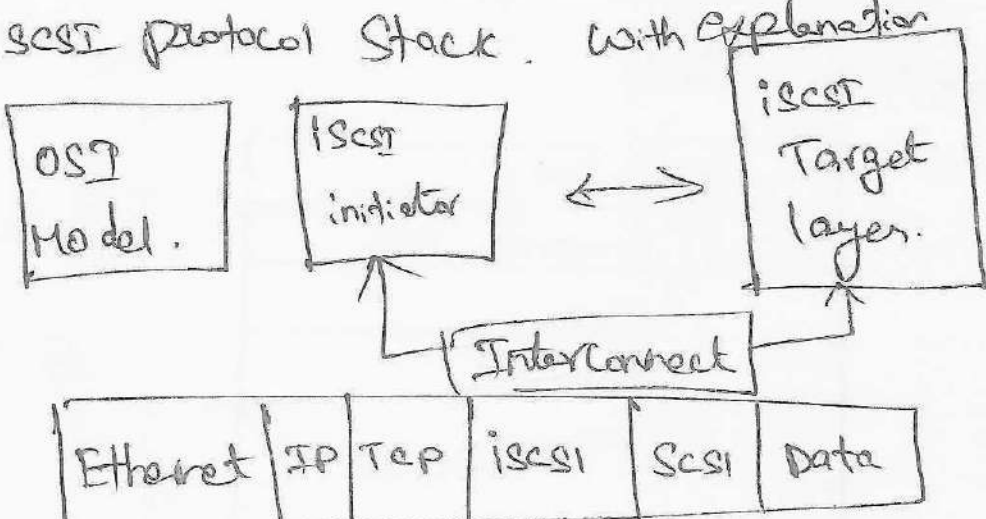
DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

## SCHEME FOR EVALUATION

CIE TEST - II

SEMESTER & SECTION: VIII & A & B.

DATE: 18.04.2021

Q. No	Details of the Answer	Marks Distribution	Total marks
1.	<p><u>iscsi topologies - Part-A</u></p> <p>i. Native topology. - Definition.</p>  <p>ii. Bridged iSCSI Connectivity. - Definition.</p> 	<p>5</p> <p>5</p>	<p>10.</p>
2.	<p style="text-align: center;">or</p> <p><u>iscsi protocol Stack with explanation</u></p> 	<p>10</p>	<p>10.</p>

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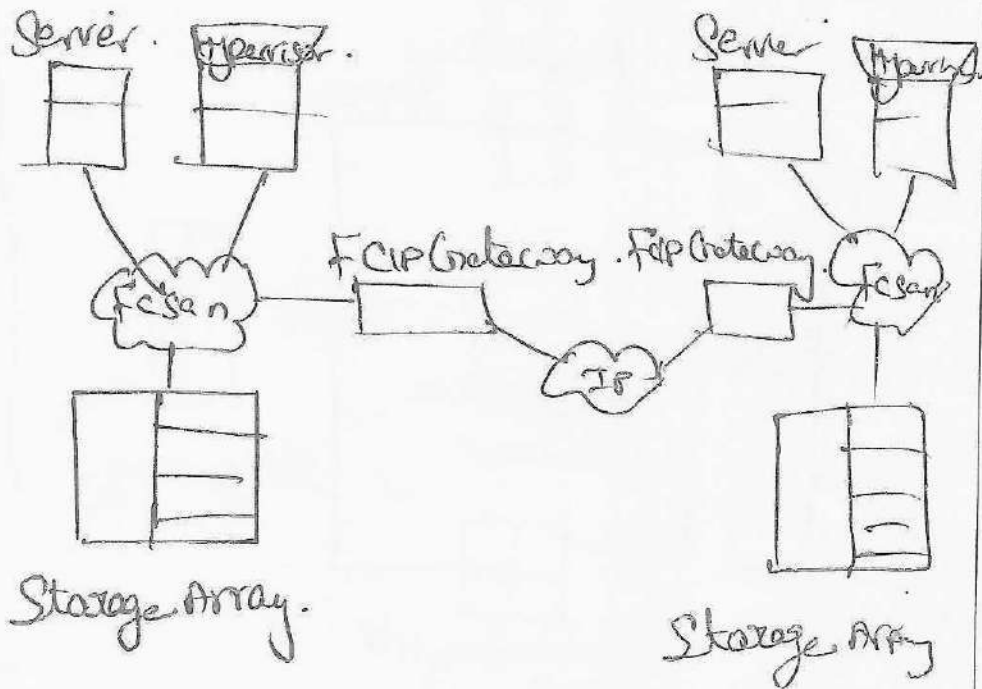


Q.No	Details of the Answer	Marks Distribution	Total marks							
3.	<p style="text-align: center;">Part. B.</p> <p>Components of NAS .</p> <ol style="list-style-type: none"> <li>1. CPU &amp; Memory.</li> <li>2. one or more NIC's.</li> <li>3. Optimised operating S/m.</li> <li>4. NFS, CIFS, protocols.</li> <li>5. ports.</li> </ol> <p>NAS Environment Architecture diagram with benefits. (or).</p> <p>NAS - Definition .</p> <p>NAS implementations .</p> <ol style="list-style-type: none"> <li>i. Unified - with Diagram.</li> <li>ii. Gateway with Diagram.</li> <li>iii. Scale out with Diagram.</li> </ol>	<p>5</p> <p>5</p> <p>1</p> <p>3</p> <p>3</p> <p>3</p>	<p>10.</p> <p>10.</p>							
5.	<p>FCIP protocol Stack .</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>Application.</td></tr> <tr><td>Ses, Commands, Data</td></tr> <tr><td>FCP</td></tr> <tr><td>FCIPP</td></tr> <tr><td>TCP</td></tr> <tr><td>IP</td></tr> <tr><td>Physical media</td></tr> </table>	Application.	Ses, Commands, Data	FCP	FCIPP	TCP	IP	Physical media	<p>5.</p>	<p>any</p>
Application.										
Ses, Commands, Data										
FCP										
FCIPP										
TCP										
IP										
Physical media										

*Spet*

Q.No

Details of the Answer

Marks  
DistributionTotal  
marksFIP Topology.

5

10

6. NAS file sharing protocols.

NFS → Searching Files and directories

opening, reading, writing to,  
closing.

Changing file attribute.

Modifying links

NFS Version 2 (NFS v2).

NFS Version 3 (NFSv3)

NFS Version 4 (NFSv4).

CIFS → Client Server protocol,

10.

Vishal

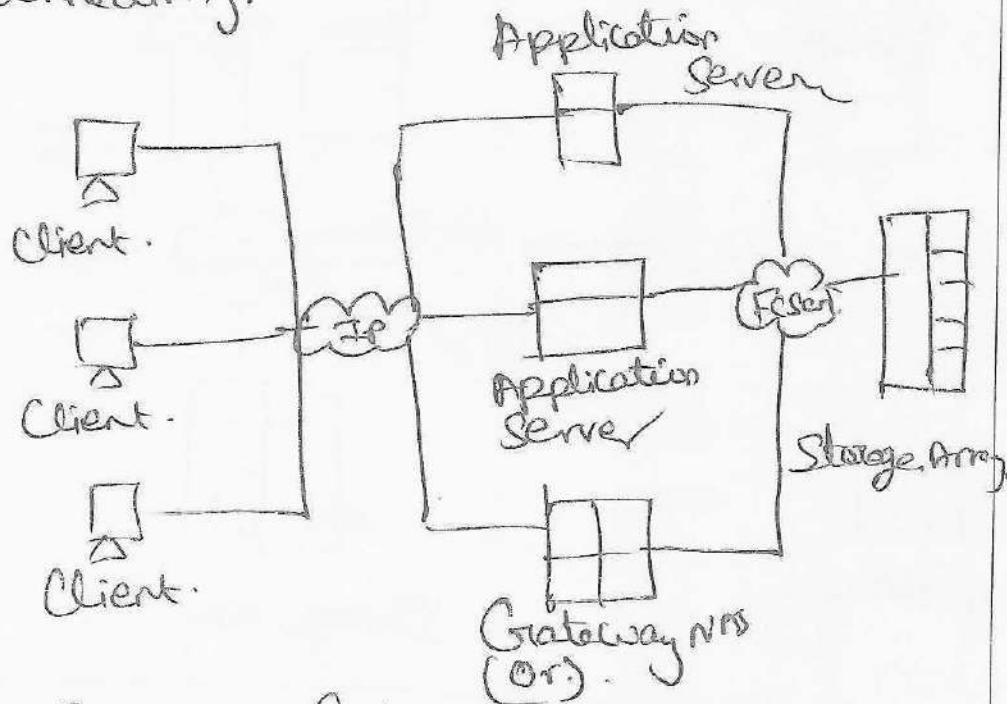
Vishal

Q.No

Details of the Answer

Marks  
DistributionTotal  
marks

7. Gateway Network Attached Storage Connectivity.



8. a. Business Continuity Definition.

Terminologies.

- i. Disaster Recovery.
- ii. Disaster Checklist.
- iii. RPO
- iv. RTO
- v. Data Vault.
- vi. Hot Site.
- vii. Cold site.
- viii. Server Clustering.

MTBF - Mean Time Between Failures.

MTTR - Mean Time to Repair

10.

7.

10.

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# CITY ENGINEERING COLLEGE

DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

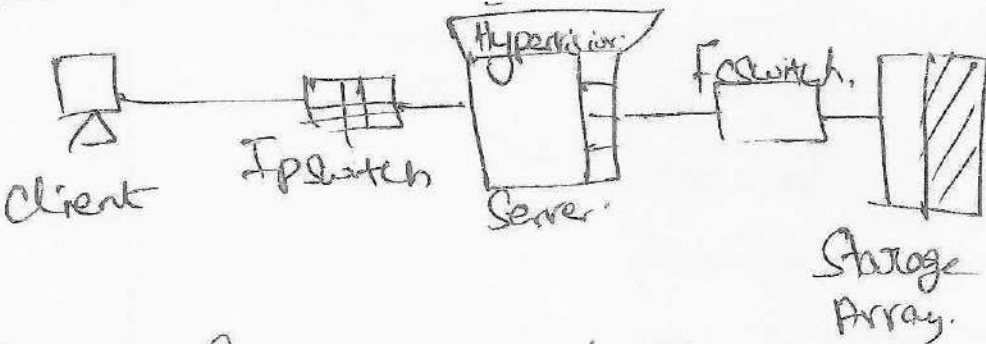
## SCHEME FOR EVALUATION

CIE TEST II

SEMESTER & SECTION: Vin

A, B

DATE: 8/4/24

Q. No	Details of the Answer	Marks Distribution	Total marks
9.	<p>a, Failure Analysis in Bc.</p> <p>It Analyze both physical &amp; virtual infrastructure.</p> <p>Important Bc Solutions.</p> <ul style="list-style-type: none"> <li>i, Backup</li> <li>ii, Local Replication</li> <li>iii, Remote Replication</li> </ul> <p><u>Single point Failures.</u></p>  <p><u>Resolving Single points of failure.</u></p> <ul style="list-style-type: none"> <li>* Configuration of HBAS,</li> <li>* Configuration of Multiple storage Array.</li> <li>i. RAID.</li> </ul>	<p>3</p> <p>7</p>	<p>10</p>

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# CITY ENGINEERING COLLEGE

DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

## SCHEME FOR EVALUATION

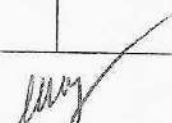
CIE TEST - VI

SEMESTER & SECTION: VIII A, B

DATE: 18/4/24

Q. No	Details of the Answer	Marks Distribution	Total marks
10.	<p><u>Life cycle of RC Planning.</u></p> <pre>graph TD; A((Establish objectives)) --&gt; B((Analyze)); B --&gt; C((Design &amp; Develop)); C --&gt; D((Implement)); D --&gt; E((Train Test Assess &amp; Maintain)); E --&gt; A;</pre>	Diagram 5 + 5 Explanation 10	10

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**CITYENGINEERINGCOLLEGE**

KanakapuraRoad,Doddakallasandra,Bengaluru-560062

**THIRD INTERNAL TEST**

Programme:CS/IS

Course Name:Storage Area Networks

Sem:VIII A&amp;B

Duration:1½Hrs

Date:08/05/2024

Time:2:30PM-4:00PM

MAX MARKS:50

*Note: Answer any FIVE questions choosing at least ONE from each part***Part-A**

		CO'S	BT'S	
1.	Describe Backup and restore operations.	10	CO1	BT1
<i>OR</i>				
2.	Discuss different backup topologies.	10	CO1	BT1

**Part-B**

3.	Mention Major Local replication technologies. Explain network based local replication	10	CO1	BT1, BT2
<i>OR</i>				
4.	A) Discuss flushing the file system buffer. B) Explain the uses of local replicas.	5 5	CO1	BT1, BT3

**Part-C**

5.	Explain host based remote replication with neat diagram.	10	CO2	BT1, BT2
<i>OR</i>				
6.	A) Difference between synchronous and asynchronous remote replication modes. B) Explain FCSCAN security architecture with a neat diagram.	5 5	CO2	BT2, BT3

**Part-D**

7.	Explain storage security domains.	10	CO2	BT2, BT3
<i>OR</i>				
8.	What is remote replication? Explain storage array based remote replication.	10	CO2	BT1, BT2

**Part-E**

9.	Write a note on i) Assets ii) Threats iii) Vulnerability	10	CO2	BT2, BT3
<i>OR</i>				
10.	Explain storage array based local replication in detail.	10	CO2	BT3, BT4

**Blooms Taxonomy Levels (BTL):**

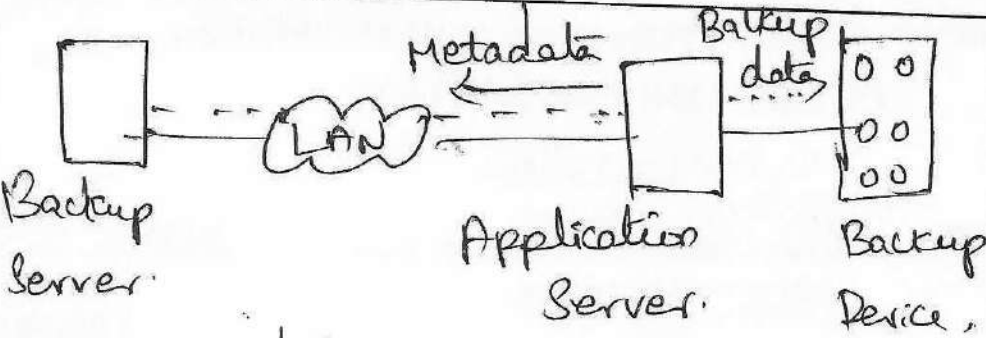
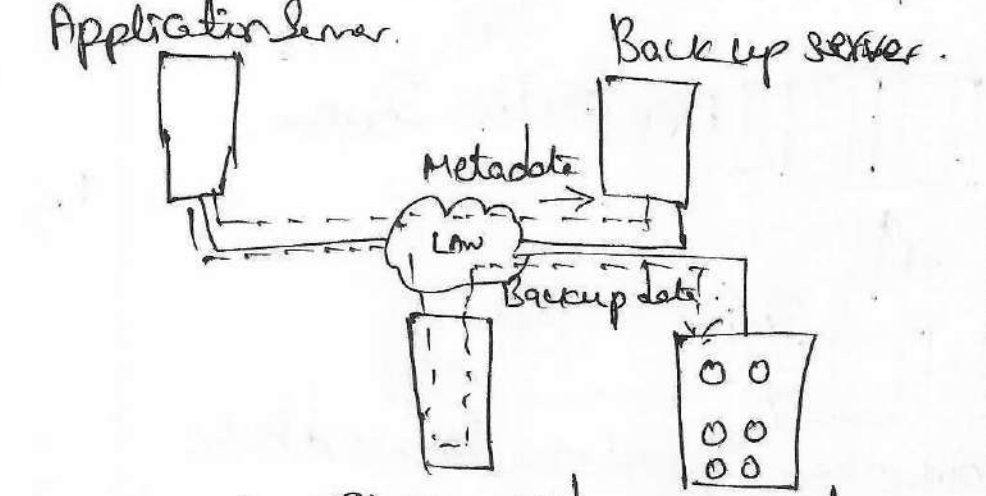
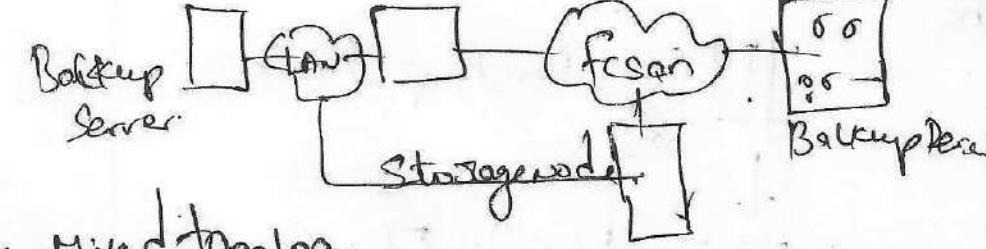
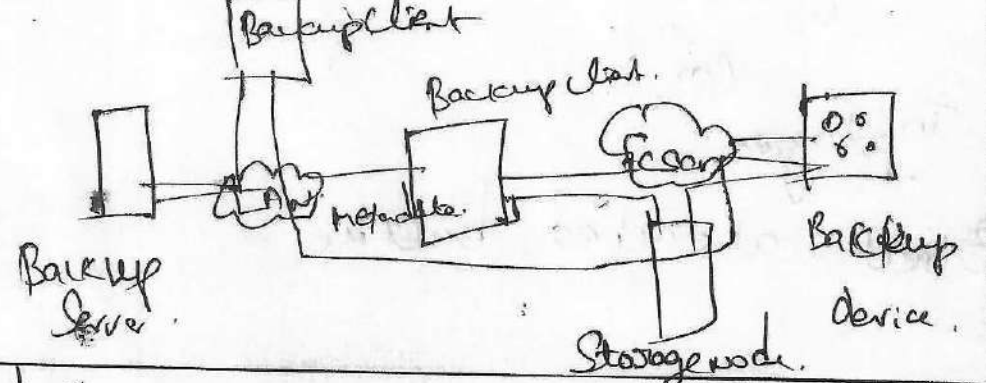
BT1- Remembering the concepts BT2-Understanding BT3 -Applying BT4 -Analyzing BT5-Evaluating

**Course Outcomes (CO's):**

CO1: Understand the techniques and summarize the concepts

CO2: Investigate the concepts and apply the same



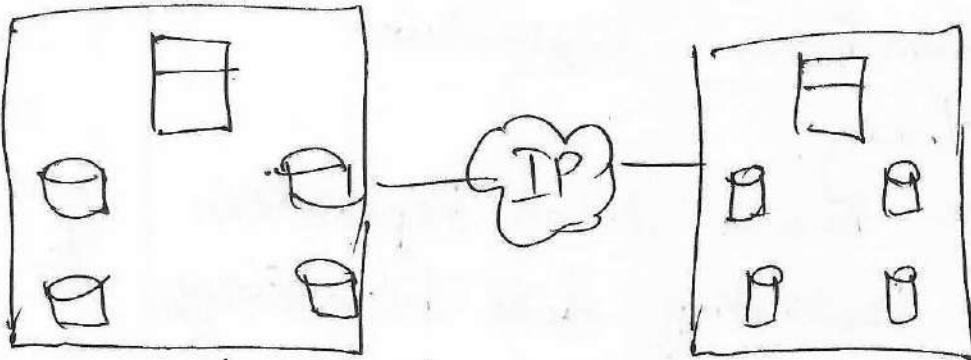
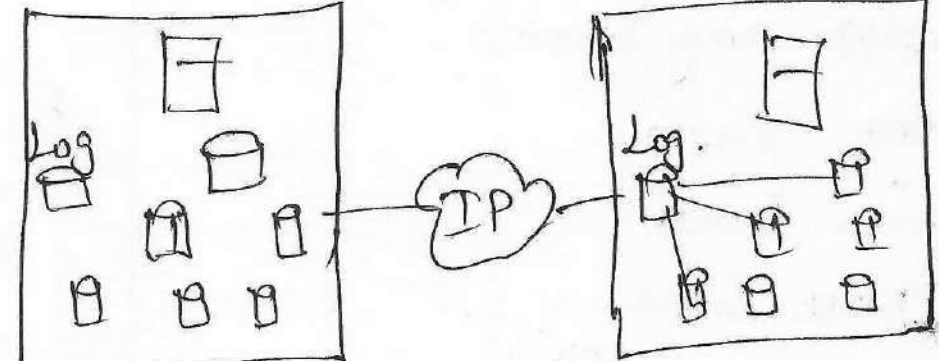
Q. No	Details of the Answer	Marks Distribution	Total marks
	 <p>Backup server      Application Server      Backup Device</p> <p>ii. <u>LAN Based backup.</u></p>  <p>Application server      Backup server</p> <p>Storage Node      Backup device</p> <p>iii. <u>SAN based backup.</u></p>  <p>Backup server      Storage node      Backup device</p> <p>iv. <u>Mixed topology</u></p>  <p>Backup server      Backup client      Storage node      Backup device</p>		10

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Q. No	Details of the Answer	Marks Distribution	Total marks		
5.	<p>Host Based Remote Replication.</p> <p>→ LVM -Based Remote Replication</p>  <p>→ Host based log shipping.</p> 	5	10.		
6.	<p>(Or)</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;"> <p>A. Synchronous</p> <p>write must be committed to the source and the target prior to acknowledging write complete to the production host.</p> </td> <td style="width: 50%; padding: 5px;"> <p>Asynchronous</p> <p>A write is committed to the source and immediately acknowledged to the host.</p> </td> </tr> </table> <p>B. <u>FCSAN</u>.</p> <p>Multiple Integrated layers for security with Architecture diagram</p>	<p>A. Synchronous</p> <p>write must be committed to the source and the target prior to acknowledging write complete to the production host.</p>	<p>Asynchronous</p> <p>A write is committed to the source and immediately acknowledged to the host.</p>	5	10.
<p>A. Synchronous</p> <p>write must be committed to the source and the target prior to acknowledging write complete to the production host.</p>	<p>Asynchronous</p> <p>A write is committed to the source and immediately acknowledged to the host.</p>				

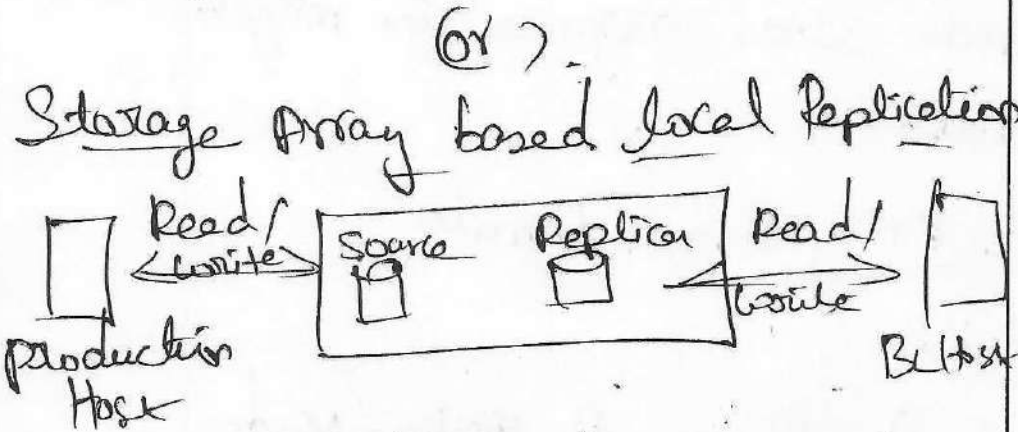
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Q. No	Details of the Answer	Marks Distribution	Total marks
7	<p>Storage Security Domains.</p>	10	10
8	<p>(or).</p> <p><u>Remote Replication</u></p> <p>Replicas of information assets at the remote sites organization mitigate the risks.</p> <p><u>Storage Array Based Remote Replication</u></p> <ol style="list-style-type: none"> <li>i. Synchronous Replication Mode</li> <li>ii. Asynchronous Replication mode.</li> <li>iii. Disk Buffered Replication mode.</li> </ol>	3	10

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Q. No	Details of the Answer	Marks Distribution	Total marks
9.	<p>i. Assets. Information, H/w, S/w and other infrastructure components are Assets.</p> <p>ii. Threats: Passive Attack, Data modification Attack. DoS. Reperidiation.</p> <p>iii. Vulnerability. Potential Attacks. Defense indepth. Layered approach to security.</p> <p>(or)</p> <p>10. Storage Array based local Replication</p>  <pre> graph LR     PH[Production Host] -- "Read/Write" --&gt; SA[Storage Array]     subgraph SA [Storage Array]         S[Source]         R[Replica]     end     SA -- "Read/Write" --&gt; BH[Backup Host]   </pre>	<p>3</p> <p>4</p> <p>3</p> <p>5</p>	<p>10.</p> <p>10.</p>
	<p>i. Full Volume mirroring.</p> <p>ii. Pointer Based full Volume Replication.</p>	<p>5</p>	

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# ATTENDANCE ASSESSMENT

Sl. No.	Reg. No.	Name	Test Marks					Sessional Marks	Remarks
			T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T	A		
1	ICE2018001	AAYUSHA KUMARI	50	50	50	4	5		
2	ICE2018002	AMISHA RASHMINATH	46	36	48	26	10	36	Aayusha
3	ICE2018003	LIKHITH R J	35	45	45	25	10	35	Amisha
4			50	50	51	22	10	32	Likhitha
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	No. of Absents								
	Initials								

**CITY ENGINEERING COLLEGE**  
**DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING**  
**LESSON PLAN 2023-2024**

**SUBJECT: STORAGE AREA NETWORKS**

**FACULTY NAME: Prof. JOHN PETER V**  
**SEM: 8<sup>th</sup>**

**SUBJECT CODE: 18CS822**  
**SEC:**

Week	Date		Topics Planned
	From	To	
I	12/2/2024	18/2/2024	<b>Module 1</b> <b>Storage System: Introduction to Information Storage:</b> Information Storage, Evolution of Storage Architecture, Data Center Infrastructure, Virtualization and Cloud Computing.
II	19/2/2024	25/2/2024	<b>Data Center Environment:</b> Application Database Management System (DBMS), Host (Compute), Connectivity, Storage, Disk Drive Components, Disk Drive Performance, Host Access to Data, Direct-Attached Storage, Storage Design Based on Application
III	27/2/2024	2/3/2024	<b>Module 2</b> Data Protection - RAID : RAID Implementation Methods, RAID Array Components, RAID Techniques, RAID Levels, RAID Impact on Disk Performance, RAID Comparison.
IV	5/3/2024	9/3/2024	<b>Intelligent Storage Systems :</b> Components of an Intelligent Storage System, Types of Intelligent Storage Systems.
V	12/3/2024	16/3/2024	<b>Fibre Channel Storage Area Networks - Fibre Channel:</b> Overview, The SAN and Its Evolution, Components of FC SAN.
VI	18/3/2024	23/3/2024	<b>Module 3</b> <b>IP SAN and FCoE: iSCSI, FCIP, Network-Attached Storage:</b> General-Purpose Servers versus NAS Devices, Benefits of NAS, File Systems and Network File Sharing, Components of NAS.
VII	25/3/2024	30/3/2024	NAS I/O Operation, NAS Implementations, NAS File-Sharing Protocols, Factors Affecting NAS Performance
VIII	1/4/2024	6/4/2024	<b>Module 4</b> <b>Introduction to Business Continuity:</b> Information Availability, BC Terminology, BC Planning Life Cycle, Failure Analysis, Business Impact Analysis, BC Technology Solutions .
IX	8/4/2024	13/4/2024	<b>Backup and Archive:</b> Backup Purpose, Backup Considerations, Backup Granularity, Recovery Considerations.



# LESSON PLAN


CITY ENGINEERING COLLEGE  
DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING  
LESSON PLAN 2023-2024


SUBJECT: STORAGE AREA NETWORKS

FACULTY NAME: Prof. JOHN PETER V  
SEM: 8<sup>th</sup>

SUBJECT CODE:18CS822  
SEC:

Week	Date		Topics Planned
	From	To	
X	15/4/2024	20/4/2024	Backup Methods, Backup Architecture, Backup and Restore Operations, Backup Topologies, Backup in NAS Environments
XI	22/4/2024	27/4/2024	<b>Module 5</b> <b>Local Replication:</b> Replication Terminology, Uses of Local Replicas, Replica Consistency, Local Replication Technologies, Tracking Changes to Source and Replica, Restore and Restart Considerations, Creating Multiple Replicas.
XII	29/4/2024	4/5/2024	<b>Remote Replication:</b> Modes of Remote Replication, Remote Replication Technologies.
XIII	6/5/2024	11/5/2024	<b>Securing the Storage Infrastructure:</b> Information Security Framework, Risk Triad, Storage Security Domains. Security Implementations in Storage Networking

  
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Teacher's Signature

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HOD'S Signature

# RECORD OF CLASS WORK

Date	Period	Topics Covered
12-2-24	2	Module-1. Storage Slm. Intro to information storage
13-2-24	1	Evolution of Storage Architecture
14-2-24	2	Virtualization & Cloud Computing
19-2-24	2	Data Center Environments.
20-2-24	2	Connectivity, Storage, Disk Drive
26-2-24	2	Host Access to data.
27-2-24	1	Data protection. (Module-2)
27-2-24	3	Raid Implementation.
4-3-24	2	Raid levels.
5-3-24	1	Intelligent Storage Slm
5-3-24	3	Fibre Channel.
11-3-24	2	San & its evolution.
11-3-24	4	Components of Fi San.
12-3-24	1	Components of IStorage Slm
12-3-24	3	Types of IS Slm.
		Module-3:
18-3-24	2	IP SAN - ISCSI
18-3-24	4	NAS
19-3-24	1	FOCF
19-3-24	3	NAS Implementation.
25-3-24	2	NAS protocols.
25-3-24	4	Factors Affecting NAS performance

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# RECORD OF CLASS WORK

Date	Period	Topics Covered
1-4-24		Module-4.
1-4-24	2	Business Continuity.
1-4-24.	4.	BC-planning life cycle.
2-4-24	1	BC Technology Solutions.
2-4-24.	3	Backup purpose.
08-4-24.	2	Backup Granularity.
08-4-24.	02	Backup & recovery.
08-4-24	4	Backup Architecture.
08-4-24.	4	Backup Topologies.
15-4-24.	2	NAS Environment.
		Module-5.
15-4-24	4	Local Replication
16-4-24	1	Replication Technologies.
16-4-24	1	Restore and Restart Considerations.
16-4-24	3	Modes of Remote Replication
2-5-24	1	Remote Replication technologies.
2-5-24	1	Technologies Explained.
6-5-24	2	Information Security Framework.
6-5-24	4	Storage Security Domains.
7-5-24	1	Security implementation in
7-5-24.	3.	Storage Networking.

*V. Pedra*

Teacher's Signature

*M. J.*

HOD'S Signature



# CITY ENGINEERING COLLEGE

Approved by AICTE New Delhi & Affiliated by VTU, Belagavi  
Doddakallasandra, Off Kanakapura Main Road,  
Next to Gokulam Apartment, Bangalore - 560 062.



## DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

### CIRCULAR

Ref No: CEC/ISE/DAC/ACY2023-2024/01

Date: 24-08-2023

This is to inform the members of Department Advisory Committee that meeting is scheduled on 31-08-2023 at 11: 00 AM in ISE department at Lab C001.

#### Agenda:

- Conduct an orientation for 3<sup>rd</sup> semester students
- Planning of Internships for 5<sup>th</sup> semester students
- Involving students in technical activities
- Conducting workshop/seminar/guest lectures

Mr. Sakhivel B  
HOD & Convener



# CITY ENGINEERING COLLEGE

Approved by AICTE New Delhi & Affiliated by VTU, Belagavi  
Doddakallasandra, Off Kanakapura Main Road,  
Next to Gokulam Apartment, Bangalore - 560 062.



## DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

### Department Advisory Committee Meeting

**Date:** 31/08/2023

**Time:** 11:00 AM

**Venue:** Room No. C001

DAC Members Present:

Sl. No	Member Name	Designation	Role
1	Mr. Sakthivel B	HOD	Convenor
2	Mr. Nandish AC	Assistant Professor	Co-Convenor
3	Mrs. Vani	Assistant Professor	Member
4	Mrs. Anita Patil	Assistant Professor	Member
5	Mr. Rajeshwar V Chattarki	C.E O of G K Robotek.	(Industry Expert)
6	Ms. Deepika R	SAP functional consultant, Exikon Technology Private Limited	Alumni

*Handwritten signatures and initials:*  
- A signature above the table.  
- Initials 'V' and 'Ad.' next to rows 3 and 4.  
- A signature 'Rajeshwar' next to row 5.  
- A signature 'D' next to row 6.

The Department Advisory Committee meeting was conducted at Department of ISE, on 31<sup>st</sup> September, 2024, at 11 AM.

#### Agenda of the Meeting:

- Conduct an orientation for 3rd semester students
- Planning of Internships for 5th semester students
- Involving students in technical activities
- Societal Projects for UG students.
- Conducting workshop/seminar/guest lectures.



# CITY ENGINEERING COLLEGE

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Next to Gokulam Apartment, Bangalore - 560 062.



## Minutes of Meeting:

During the Department Advisory Committee meeting, an overview of the department was provided, showcasing student achievement, and faculty accomplishments and contributions. The members discussed suggestions for improvement and reviewed the meeting agenda.

The following points were discussed in the meeting:

- Committee members suggested establishing MOUs with various IT industries to provide students with internship opportunities.
- It was proposed to conduct a technical symposium with increased student participation.
- The committee decided to organize guest lecture, industry visit, and workshop for students in the 3rd, 5th, and 7th semesters.
- It was discussed to conduct an orientation for third-semester students to raise awareness about the 22-Scheme curriculum, particularly regarding registration for NSS, Yoga, or Physical Education.
- The HOD emphasized the importance of societal projects and the need to find opportunities for such initiatives.

**Mr. Sakthivel B**  
**HOD & Convener**



# CITY ENGINEERING COLLEGE, BENGALURU-560061.

## Department of Information Science and Engineering

### ACADEMIC CALENDAR 2023-24 Odd SEM

October 2023		November 2023		December 2023		January 2024		February 2024		March 2024		April 2024			
DAY	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	
SUN	1														
MON	2	GANDHI JAYANTHI					1	II test for Istsem , III test for VII sem, I sttest Vsem					1		
TUE	3						2							2	
WED	4		1	RAJYOTSAVA DAY			3							3	
THU	5		2				4		1				4		
FRI	6		3		1		5		2		1		5		
SAT	7	1st Saturday holiday	4	1st Saturday holiday	2	1st Saturday holiday	6	Last Working Dayl & 7	3	1st Saturday holiday	2	1st Saturday holiday	6	1st Saturday holiday	
SUN	8		5		3		7		4		3		7		
MON	9	Orientation Pgm	6	Ist test I sem and VII sem	4	II nd test VII sem, I st test III sem	8	Practical Exam I, 7	5	2nd test 3 <sup>rd</sup> sem V sem,	4	III test for V sem	8		
TUE	10		7		5		9		6				5	9	Ugadhi, Ramzan
WED	11		8		6		10		7				6	10	
THU	12		9		7		11		8				7	11	
FRI	13		10		8		12		9		8	Maha Shivarathri	12		
SAT	14	MAHALAYA AMAVASA	11		9		13		10	Last working day-3rd	9	Last working day-5th	13		
SUN	15		12		10		14		11		10		14		
MON	16	VAC	13		11		15	Sankranthi	12	Start of practical 3 rd	11	Start of practical 5th	15		
TUE	17		14	BALIPADYAMI	12		16		13	Start of 8th sem	12		16		
WED	18		15		13		17		14		13		17		
THU	19		16		14		18		15		14		18		
FRI	20		17		15		19		16		15		19		
SAT	21	3rd Saturday holiday	18	3rd Saturday holiday	16	3rd Saturday holiday	20	3rd Saturday holiday	17	3rd Saturday holiday	16	3rd Saturday holiday	20	3rd Saturday holiday	
SUN	22		19		17		21		18		17		21		
MON	23	AYUDHA POOJA	20	VAC	18		22	THEORY EXAM 1& 7	19	Start of 2 <sup>nd</sup> sem	18	Start of 4th sem	22	Start of 6th sem	
TUE	24	VIJAYA DASHAMI	21		19		23		20		19		23		
WED	25	Start of 5th sem INTERNSHIP ,3rd sem	22		20		24		21		20		24		
THU	26		23		21		25		22		21		25		
FRI	27		24		22		26	Republic day	23		22	Start of theory 5th	26		
SAT	28	VALMIKI JAYANTHI	25	Start of 5th sem class	23		27		24		23		27		
SUN	29		26		24		28		25		24		28		
MON	30		27		25	CHRISTMAS	29		26	Start of theory 3rd	25	Holi	29		
TUE	31		28		26		30		27		26		30		
WED			29		27		31		28		27				
THU			30	KANAKADASA JAYANTHI	28				29		28				
FRI					29						29	Good Friday			
SAT					30						30				
SUN					31						31				



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Academic Year: 2023-24 / Odd Sem

## DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

### COURSE PREFERNCE

Name of the Faculty: Mrs. R. Mirudhula

Designation: Assistant Professor

Year / Semester: II, III/III, V

Sl. No	Course Code and Name	Year/Semester
1	BIS304: Data Structures using C/C++	II/ III
2	BIS303: Operating System	II/ III
3	BIS306A: Oops with Java	II/ III
4	PCC21CS53: Database Management System	III/ V
5	AEC21CS58X/21CSL58X: Angular JS and Node JS	III/ V
6	18CS734: User Interface Design	II/ III

Signature of faculty





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Academic Year: 2023-24 / Odd Sem

## DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

### COURSE ALLOCATION

Sl.No	Name of the Faculty	Course Code and Name	Year/ Semester	Signature
1	Mr. B. Sakthivel	IPCC21CS52: Computer Networks	III/ V	
2	Mr. Nandish A C	PCC21CS53 : Database Management System BIS303: Operating System	III/ V II/ III	
3	Mrs. Anita Patil	BIS302: Digital Design & Computer Organization(CS)	II/ III	
4	Mrs. Nayana R K	BIS306A: Oops with Java BSC21CS51: Automata Theory & Compiler Design	II/ III III/ V	
5	Mrs. Vani	BIS302: Digital Design & Computer Organization	II/ III	
6	Mrs. R. Mirudhula	BIS304: Data Structures using C/C++	II/ III	
7	Mr. V. John Peter	PCC21CS53 : Database Management System	III/ V	

HOD, ISE

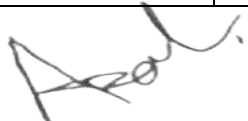


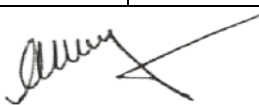
**CITY ENGINEERING COLLEGE**  
**BRANCH: INFORMATION SCIENCE & ENGINEERING**  
**TIME TABLE ACY – 2023-24**

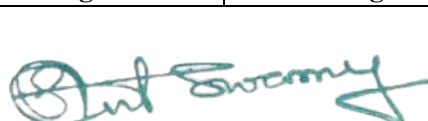
**SEMESTER: III**

**ROOM NO: 204**

DAY	9:00-10:00	10:00-11:00	11:00-11:15	11:15 -12:15	12:15-1:15	1:15-2:00	2:00-3:00	3:00-4:00	4:00-5:00	
MON	Oops Lab(D1)// DAE(D2)		<b>BREAK</b>	MAT	DDCO	<b>LUNCH</b>	DS	OS	MAT	
TUE	DDCO Lab (D3) / DS Lab (D2)/ DAE(D1)			MAT	OS		Oops Lab(D2)/ DAE(D3)			
WED	DDCO Lab (D1) / OS Lab(D2)/ DS Lab (D3)			DS			Oops	MAT	MAT	
THU	DDCO	MAT		OS Lab(D1)/ Oops Lab(D3)/			Oops			
FRI	MAT	DDCO		OS	DS		DS Lab (D1)/ DDCO Lab(D2) / OS Lab (D3)			
SAT	NSS/PE/Yoga /SCR			NSS/PE/Yoga /SCR			NSS/PE/Yoga /SCR			
	<b>SUBJECT CODE</b>	<b>SUBJECT NAME</b>		<b>FACULTY NAME</b>	<b>SUBJECT CODE</b>		<b>SUBJECT NAME</b>	<b>FACULTY NAME</b>		
	BIS301	Mathematics for CSE Stream	Mrs. Vanitha	BIS302	Digital Design & Computer Organization Lab	Mrs. Vani Mrs. Tara				
	BIS302	Digital Design & Computer Organization	Mrs. Vani	BIS303	Operating System Lab	Mr.. Nandish A C Ms. Chandana				
	BIS303	Operating System	Mr. Nandish A C	BISL305	Data Structure Lab	Mrs. Nayana R K Mrs. R. Mirudhula				
	BIS304	Data Structures using C/C++	Mrs. R. Mirudhula	BIS306A	Oops with Java Lab	Mrs. Nayana R K Ms/. Harshita				
	BIS306A	Oops with Java	Mrs. Nayana R K	BSC307	Social Connect and Responsibility	Prof. Meghana				
	BIS308A	Data Analytics with Excel	Mr. Ramesh	BNSK359	NSS/PE/Yoga	Prof. Rangaswamy				

  
**Time Table Incharge**

  
**HOD**

  
**PRINCIPAL**



**CITY ENGINEERING COLLEGE**  
**BRANCH: INFORMATION SCIENCE & ENGINEERING**  
**TIME TABLE ACY – 2023-24**

**SEMESTER: V**

**ROOM NO: 304**

DAY	9:00-10:00	10:00-11:00	11:00-11:15	11:15 -12:15	12:15-1:15	1:15-2:00	2:00-3:00	3:00-4:00	4:00-5:00	
MON	ES	DBMS	<b>BREAK</b>	DBMS Lab		<b>LUNCH</b>	Angular JS and Node JS Lab			
TUE	DBMS	CN		RM&IPR	RM&IPR					
WED	CN			CN Lab				ES		
THU	AT&CD	CN		AI&ML	DBMS					
FRI	AI&ML	AT&CD		AI&ML	AT&CD					
SAT	Seminar			Seminar						
SUBJECT CODE	SUBJECT NAME		FACULTY NAME		SUBJECT CODE		SUBJECT NAME		FACULTY NAME	
BSC21CS51	Automata Theory & Compiler Design		Mrs. Nayana R K		IPCC21CS52		Computer Networks Lab		Mr.. Nandish A C / Mr. V John Peter	
IPCC21CS52	Computer Networks		Mr. B. Sakthivel		PCC21CSL55		Database Management System Lab with Mini Project		Mr. Nandish A C / P. Mr. V. John Peter	
PCC21CS53	Database Management System		Mr. Nandish A C							
PCC21CS54	Artificial Intelligence & Machine Learning		Mrs. Tara							
AEC21XX56	Research Methodology & Intellectual Property Rights		Mrs. Tara							
HSMC21CIV57	Environmental Studies		Mrs. Meghana							
AEC21CS58X/21 CSL58X	Angular JS and Node JS		Mrs. Sangeeta Rao Mrs. Varalaxmi							

**Time Table Incharge**

**HOD**

**PRINCIPAL**



**CITY ENGINEERING COLLEGE**  
**BRANCH: INFORMATION SCIENCE & ENGINEERING**  
**TIME TABLE ACY – 2023-24**

**SEMESTER: VII**

**ROOM NO: 402**

DAY	9:00-10:00	10:00-11:00	11:00-11:15	11:15 -12:15	12:15-1:15	1:15-2:00	2:00-3:00	3:00-4:00	4:00-5:00
MON	AIML	E&E	<b>BREAK</b>	BDA	NMS	<b>LUNCH</b>	UID	Project Work	
TUE	UID	BDA		NMS	AIML		AIML LAB (B1 Batch)		
WED	BDA	AIML		E&E	E&E		Internship		
THU	NMS	UID		AIML	BDA		AIML LAB (B2 Batch)		
FRI	Internship			Internship			Placement Activities		
SAT									
S.No	SUBJECT CODE			SUBJECT NAME			FACULTY NAME		
1	18CS71		Artificial Intelligence and Machine Learning			Mrs. Swetha. A			
2	18CS72		Big Data Analytics			Mr. Girish G A			
3	18CS734		User Interface Design			Ms. Shravya			
4	18CS742		Network Management			Dr. Y S Kumaraswamy			
5	18ME751		Energy and Environment (Open Elective)			Mr. Harshavardhan			
6	18CSL76		Artificial Intelligence and Machine Learning Laboratory			Mrs. Swetha A			
7	18CSP77		Project Work Phase I			Mrs. Swetha A/ Mr. Gangappa			

**Time Table Incharge**

**HOD**

**PRINCIPAL**



**CITY ENGINEERING COLLEGE**  
**BRANCH: INFORMATION SCIENCE & ENGINEERING**  
**TIME TABLE ACY – 2023-24**

**Faculty Name: Mr. Nandish A C**

DAY	9:00-10:00	10:00-11:00	11:00-11:15	11:15 -12:15	12:15-1:15	1:15-2:00	2:00-3:00	3:00-4:00	4:00-5:00	
MON		DBMS	<b>BREAK</b>	DBMS Lab		<b>LUNCH</b>	OS			
TUE	DBMS				OS					
WED	OS Lab(D2)				CN Lab					
THU		DBMS			OS Lab(D1)					
FRI					OS				OS Lab(D1)	
SAT										

**HOD, ISE**



**CITY ENGINEERING COLLEGE**  
**BRANCH: INFORMATION SCIENCE & ENGINEERING**  
**TIME TABLE ACY – 2023-24**

**Faculty Name: Mrs. Vani**

DAY	9:00-10:00	10:00-11:00	11:00-11:15	11:15 -12:15	12:15-1:15	1:15-2:00	2:00-3:00	3:00-4:00	4:00-5:00		
MON	DDCO Lab (C1)		<b>BREAK</b>		DDCO	<b>LUNCH</b>					
TUE	DDCO Lab (D3)							DDCO Lab (C2)			
WED	DDCO Lab (D1)				DDCO						
THU	DDCO				DDCO Lab (C3)			DDCO			
FRI		DDCO			DDCO				DDCO Lab (D2)		
SAT											

**HOD, ISE**

## V Semester

<b>COMPUTER NETWORKS</b>			
Course Code:	21CS52	CIE Marks	50
Teaching Hours/Week (L:T:P: S)	3:0:2:0	SEE Marks	50
Total Hours of Pedagogy	40T + 20P	Total Marks	100
Credits	04	Exam Hours	03
<b>Course Objectives:</b>			
<p>CLO 1. Fundamentals of data communication networks.            CLO 2. Software and hardware interfaces            CLO 3. Application of various physical components and protocols            CLO 4. Communication challenges and remedies in the networks.</p>			
<b>Teaching-Learning Process (General Instructions)</b>			
<p>These are sample Strategies, which teachers can use to accelerate the attainment of the various course outcomes.</p> <ol style="list-style-type: none"> <li>1. Lecturer method (L) need not to be only traditional lecture method, but alternative effective teaching methods could be adopted to attain the outcomes.</li> <li>2. Use of Video/Animation to explain functioning of various concepts.</li> <li>3. Encourage collaborative (Group Learning) Learning in the class.</li> <li>4. Ask at least three HOT (Higher order Thinking) questions in the class, which promotes critical thinking.</li> <li>5. Adopt Problem Based Learning (PBL), which fosters students' Analytical skills, develop design thinking skills such as the ability to design, evaluate, generalize, and analyze information rather than simply recall it.</li> <li>6. Introduce Topics in manifold representations.</li> <li>7. Show the different ways to solve the same problem and encourage the students to come up with their own creative ways to solve them.</li> <li>8. Discuss how every concept can be applied to the real world - and when that's possible, it helps improve the students' understanding.</li> </ol>			
<b>Module-1</b>			
<b>Introduction to networks:</b> Network hardware, Network software, Reference models,			
<b>Physical Layer:</b> Guided transmission media, Wireless transmission			
<b>Textbook 1: Ch.1.2 to 1.4, Ch.2.2 to 2.3</b>			
<b>Laboratory Component:</b>			
<ol style="list-style-type: none"> <li>1. Implement Three nodes point - to - point network with duplex links between them for different topologies. 1Set the queue size, vary the bandwidth, and find the number of packets dropped for various iterations.</li> </ol>			
<b>Teaching-Learning Process</b>	Chalk and board, Problem based learning, Demonstration		
<b>Module-2</b>			
<b>The Data link layer:</b> Design issues of DLL, Error detection and correction, Elementary data link protocols, Sliding window protocols.			
<b>The medium access control sublayer:</b> The channel allocation problem, Multiple access protocols.			
<b>Textbook 1: Ch.3.1 to 3.4, Ch.4.1 and 4.2</b>			
<b>Laboratory Component:</b>			
<ol style="list-style-type: none"> <li>1. Implement simple ESS and with transmitting nodes in wire-less LAN by simulation and determine the throughput with respect to transmission of packets</li> <li>2. Write a program for error detecting code using CRC-CCITT (16- bits).</li> </ol>			

Teaching-Learning Process	Chalk and board, Problem based learning, Demonstration
<b>Module-3</b>	
<b>The Network Layer:</b> Network Layer Design Issues, Routing Algorithms, Congestion Control Algorithms, QoS.	
<b>Textbook 1: Ch 5.1 to 5.4</b>	
<b>Laboratory Component:</b>	
<ol style="list-style-type: none"> <li>1. Implement transmission of ping messages/trace route over a network topology consisting of 6 nodes and find the number of packets dropped due to congestion in the network.</li> <li>2. Write a program to find the shortest path between vertices using bellman-ford algorithm.</li> </ol>	
Teaching-Learning Process	Chalk and board, Problem based learning, Demonstration
<b>Module-4</b>	
<b>The Transport Layer:</b> The Transport Service, Elements of transport protocols, Congestion control, The internet transport protocols.	
<b>Textbook 1: Ch 6.1 to 6.4 and 6.5.1 to 6.5.7</b>	
<b>Laboratory Component:</b>	
<ol style="list-style-type: none"> <li>1. Implement an Ethernet LAN using n nodes and set multiple traffic nodes and plot congestion window for different source / destination.</li> <li>2. Write a program for congestion control using leaky bucket algorithm.</li> </ol>	
Teaching-Learning Process	Chalk and board, Problem based learning, Demonstration
<b>Module-5</b>	
<b>Application Layer:</b> Principles of Network Applications, The Web and HTTP, Electronic Mail in the Internet, DNS—The Internet's Directory Service.	
<b>Textbook 2: Ch 2.1 to 2.4</b>	
Teaching-Learning Process	Chalk and board, Problem based learning, Demonstration
<b>Course Outcomes (Course Skill Set)</b>	
At the end of the course the student will be able to:	
<ol style="list-style-type: none"> <li>CO 1. Learn the basic needs of communication system.</li> <li>CO 2. Interpret the communication challenges and its solution.</li> <li>CO 3. Identify and organize the communication system network components</li> <li>CO 4. Design communication networks for user requirements.</li> </ol>	
<b>Assessment Details (both CIE and SEE)</b>	
The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 40% of the maximum marks (20 marks). A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/course if the student secures not less than 35% (18 Marks out of 50) in the semester-end examination (SEE), and a minimum of 40% (40 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together	
<b>Continuous Internal Evaluation:</b>	
Three Unit Tests each of <b>20 Marks (duration 01 hour)</b>	
<ol style="list-style-type: none"> <li>1. First test at the end of 5<sup>th</sup> week of the semester</li> <li>2. Second test at the end of the 10<sup>th</sup> week of the semester</li> <li>3. Third test at the end of the 15<sup>th</sup> week of the semester</li> </ol>	
Two assignments each of <b>10 Marks</b>	
<ol style="list-style-type: none"> <li>4. First assignment at the end of 4<sup>th</sup> week of the semester</li> <li>5. Second assignment at the end of 9<sup>th</sup> week of the semester</li> </ol>	
Practical Sessions need to be assessed by appropriate rubrics and viva-voce method. This will contribute to <b>20 marks</b> .	



- Rubrics for each Experiment taken average for all Lab components – 15 Marks.
- Viva-Voce– 5 Marks (more emphasized on demonstration topics)

The sum of three tests, two assignments, and practical sessions will be out of 100 marks and will be **scaled down to 50 marks**

(to have a less stressed CIE, the portion of the syllabus should not be common /repeated for any of the methods of the CIE. Each method of CIE should have a different syllabus portion of the course).

**CIE methods /question paper has to be designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.**

#### **Semester End Examination:**

Theory SEE will be conducted by University as per the scheduled timetable, with common question papers for the subject (**duration 03 hours**)

1. The question paper will have ten questions. Each question is set for 20 marks. Marks scored shall be proportionally reduced to 50 marks
2. There will be 2 questions from each module. Each of the two questions under a module (with a maximum of 3 sub-questions), **should have a mix of topics** under that module.

The students have to answer 5 full questions, *selecting one full question from each module*

#### **Suggested Learning Resources:**

##### **Textbooks:**

1. Computer-Networks- Andrew S. Tanenbaum and David J. Wetherall, Pearson Education, 5th-Edition. ([www.pearsonhighered.com/tanenbaum](http://www.pearsonhighered.com/tanenbaum))
2. Computer Networking A Top-Down Approach -James F. Kurose and Keith W. RossPearson Education 7<sup>th</sup> Edition.

##### **Reference Books:**

1. Behrouz A Forouzan, Data and Communications and Networking, Fifth Edition, McGraw Hill, Indian Edition
2. Larry L Peterson and Bruce S Davie, Computer Networks, fifth edition, ELSEVIER

##### **Weblinks and Video Lectures (e-Resources):**

1. <https://www.digimat.in/nptel/courses/video/106105183/L01.html>
2. <http://www.digimat.in/nptel/courses/video/106105081/L25.html>
3. <https://nptel.ac.in/courses/106105081>
4. VTU e-Shikshana Program

##### **Activity Based Learning (Suggested Activities in Class)/ Practical Based learning**

Simulation of Personal area network, Home area network, achieve QoS etc.

**Note:** For the Simulation experiments modify the topology and parameters set for the experiment and take multiple rounds of reading and analyze the results available in log files. Plot necessary graphs and conclude using NS2. Installation procedure of the required software must be demonstrated, carried out in groups, and documented in the report. Non simulation programs can be implemented using Java

**CITY ENGINEERING COLLEGE - BANGALORE-61**  
**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING**  
**INFORMATION**  
**COURSE/LESSON PLAN-2023-24 (ODD)**

**Course Title : Computers Networks**

**Course Code: 21CS52**

**No. of Lecture Hrs./Week : 03**

**Exam Hours : 03**

**Total No. of Lecture Hrs. : 40**

**SEE Marks : 50**

**CIE Marks : 50**

**Objective:** This course focuses on the Basic concepts of Networks.. Studying the different layers of the reference models and some of the networking concepts with the simulation and java programs.

Sl. No	Date	Subject: 21CS52– Computer Networks
<b>Module 1</b>		
1	27/11/23	Introduction
2	29/11/23	Introduction to networks: Network hardware,
3	04/12/23	Network software
4	06/12/23	Reference models
5	07/12/23	Guided transmission media
6	11/12/23	Wireless transmission
7	13/12/23	Introduction to TCL scripts
8	14/12/23	Implement Three nodes point – to – point network with duplex links between them for different topologies. Set the queue size, vary the bandwidth, and find the number of packets dropped for various iterations. (Program 1)
<b>Module 2</b>		
9	18/12/23	The Data link layer: Design issues of DLL,
10	20/12/23	Error detection and correction,
11	21/12/23	Elementary data link protocols,
12	27/12/23	Sliding window protocols.

13	28/12/23	The medium access control sublayer: The channel allocation problem,
14	04/01/24	Multiple access protocols.
15	08/01/24	Implement simple ESS and with transmitting nodes in wireless LAN by simulation and determine the throughput with respect to transmission of packets
16	10/01/24	Write a program for error detecting code using CRC-CCITT (16-bits).
		<b>Module 3</b>
17	11/01/24	The Network Layer: Network Layer Design Issues,
18	17/01/24	Issues, Routing Algorithms,
19	18/01/24	Congestion Control Algorithms,
20	22/01/24	Congestion Control Algorithms,
21	24/01/24	Implement transmission of ping messages/traceroute over a network topology consisting of 6 nodes and find the number of packets dropped due to congestion in the network.
22	25/01/24	Bellman ford algorithm and examples
23	29/01/24	Write a program to find the shortest path between vertices using the bellman-ford algorithm.
		<b>Module 4</b>
24	31/01/24	The Transport Layer: The Transport Service,
25	01/02/24	Elements of transport protocols,
26	08/02/24	Congestion control,
27	12/02/24	The internet transport protocols.
28	14/02/24	The internet transport protocols.
29	15/02/24	Implement an Ethernet LAN using n nodes and set multiple traffic nodes and plot congestion window for different source / destination.
30	19/02/24	Write a program for congestion control using a leaky bucket algorithm.
31	21/02/24	Application Layer:

32	22/02/24	Principles of Network Applications,
33	26/02/24	The Web, HTTP,
34	28/02/24	Electronic Mail in the Internet,
35	29/02/24	DNS—The Internet's Directory Service.

**Textbooks:**


1. Computer-Networks- Andrew S. Tanenbaum and David J. Wetherall, Pearson Education, 5th- Edition. ([www.pearsonhighered.com/tanenbaum](http://www.pearsonhighered.com/tanenbaum))
2. Computer Networking A Top-Down Approach -James F. Kurose and Keith W. Ross Pearson Education 7th Edition.

**Reference Books:**

1. Behrouz A Forouzan, Data and Communications and Networking, Fifth Edition, McGraw Hill, Indian Edition
2. Larry L Peterson and Bruce S Davie, Computer Networks, fifth edition, ELSEVIER

**INTERNAL ASSESSMENT PLAN**

Mode	Proposed dates	Marks
1 <sup>st</sup> Internals	01/1/24, 2/1/24 & 3/1/24	20
2 <sup>nd</sup> Internals	5/02/24, 06/02/24 & 07/02/24	20
3 <sup>rd</sup> Internals	04/03/24, 05/03/24 & 06/03/24	20

  
Faculty-Incharge

Sakthivel B

**CITY ENGINEERING COLLEGE**  
**Department of Information Science and Engineering**  
**LESSON PLAN 2023 - 24**

**COURSE NAME:** Computers Networks

**COURSE CODE:** 21CS52

**FACULTY NAME:** Prof. Sakthivel B

**SEM:** V

**SECTION:** - D

Week	Date		Topics Planned
	From	To	
I	27-11-23	1-12-23	<b>Module1:</b> Introduction Introduction to networks:
II	4-12-23	8-12-23	Network hardware, Network software, Reference models,
III	11-12-23	15-12-23	<b>Physical Layer:</b> Guided transmission media, Wireless transmission
IV	18-12-23	22-12-23	<b>Module-2 :</b> The Data link layer: Design issues of DLL,
V	25-12-23	29-12-23	Error detection and correction,
VI	1-01-24	5-01-24	Elementary data link protocols, Sliding window protocols.
VII	8-01-24	12-01-24	<b>The medium access control sublayer:</b> The channel allocation problem, Multiple access protocols.
VII	15-01-24	19-01-24	Revision ; <b>FIRST CIE</b>
IX	22-01-24	27-01-24	<b>Module-3 : The Network Layer:</b> Network Layer Design Issues, Routing Algorithms
X	29-01-24	2-02-24	Congestion Control Algorithms, QoS.

**CITY ENGINEERING COLLEGE**  
**Department of Information Science and Engineering**  
**LESSON PLAN 2023 - 24**

**COURSE NAME: Computers Networks**

**COURSE CODE: 21CS52**

**FACULTY NAME: Prof. Sakthivel B**

**SEM: V**

**SECTION: - D**

Week	Date		Topics Planned
	From	To	
XI	5-02-24	9-02-24	<b>Module 4:</b> The Transport Layer: The Transport Service, Elements of transport protocols, Congestion control, The internet transport protocols.
XII	12-02-24	16-02-24	<b>SECOND CIE</b>
XIII	19-02-24	23-02-24	<b>Module 5: Application Layer:</b> Principles of Network Applications,
XIV	26-02-24	1-03-24	The Web and HTTP, Electronic Mail in the Internet,
XV	4-03-24	8-03-24	DNS—The Internet's Directory Service.
16-03-2024			Last Working Day



**FACULTY**



**HOD**

Question Bank on Computer Networks (21CS52)

**Module 1**

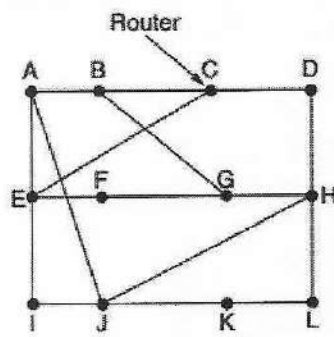
SL	Questions	RBL	CO	Mark
1	<b>Describe</b> the key design issues for the layers encountered in computer networks as information moves through different layers.	L2	1	10
2	<b>How</b> does connectionless service differ from connection-oriented service, and <b>what</b> analogy is used to describe it? <b>Explain</b> it with six different types of service.	L1	1	10
3	<b>Describe</b> the primitives associated with connection-oriented service and <b>Explain</b> the role of primitives like SEND, RECEIVE, and DISCONNECT in facilitating communication between client and server processes.	L2	1	10
4	<b>Describe</b> the TCP/IP protocol suite, accompanied by a clear diagram highlighting its distinctions from the OSI model. <b>Illustrate</b> the TCP/IP model by outlining the protocols associated with each layer.	L2	1	10
5	<b>Explain</b> the primary function of the physical layer in networking. <b>How</b> does the physical layer contribute to the transmission of data between machines?	L1	1	10
6	<b>Describe</b> magnetic media and twisted pair cables, including their respective specifications, accompanied by diagram.	L2	1	10
7	<b>Describe</b> fiber optics and provide examples illustrating the transmission of light ray through fiber.	L2	1	10
8	<b>Discuss</b> the electromagnetic spectrum and its applications in communication. <b>What</b> is the significance of radio waves being omnidirectional, <b>why</b> are radio frequency (RF) waves widely used for communication, both indoors and outdoors?	L2	1	10

**Module 2**

SL	Questions	RBL	CO	Mark
1	<b>Describe</b> how the mechanism of error correction and detection is handled by the Data link layer in detail.	L2	2	10
2	<b>Illustrate</b> how errors are detected using CRC-CCITT (16- bits) with an example.	L2	2	10
3	<b>Write</b> a note on i) Data link layer design issues ii) Elementary data link protocols.	L1	2	10
4	<b>Compare</b> and <b>Contrast</b> A Simplex Stop-and-Wait Protocol for an Error-Free Channel against A Simplex Stop-and-Wait Protocol for a Noisy Channel.	L2	2	10
5	<b>Describe</b> A Protocol Using Go-Back-N in detail.	L2	2	10
6	<b>Elucidate</b> A Protocol Using Selective Repeat in detail.	L1	2	10
7	<b>Give</b> a detailed comparison between pure ALOHA and slotted ALOHA.	L1	2	10
8	<b>Explain</b> various Carrier Sense Multiple Access Protocols in detail.	L1	2	10

**Module 3**

SL	Questions	RBL	CO	Mark
1	<b>Distinguish</b> between virtual circuit and Datagram network.	L2	3	10
2	<b>Illustrate</b> types of routing algorithms. <b>Elucidate</b> with an example shortest path algorithm.	L2	3	10

3	<p><b>Apply and show the best</b> distance for a given source and destination using Bellman-Ford (Distance Vector Routing) algorithm.  <b>Note:</b> Source is J and the Destination is G</p> 	L3	3	10
4	<p><b>Demonstrate</b> the count-to-infinity problem due to convergence while finding the best route in a network.</p>	L3	3	10
5	<p><b>Distinguish</b> between Hierarchical and link state routing with an example.</p>	L2	3	10



## Module - 1

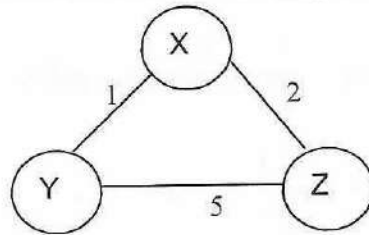
### Assignment Questions

1. Define Computer Networks. List and explain uses of Computer Networks.
2. Write a short note on
  - a. PAN
  - b. LAN
  - c. MAN
  - d. WAN
3. Explain the Design issues of the layers.
4. Distinguish between connection-oriented and connection-less services.
5. Explain client-server interaction in connection oriented network with neat diagram.
6. Explain OSI Reference model with a neat diagram.
7. Explain the functions and protocols and services of each layer of TCP/IP Model?
8. Distinguish between OSI and TCP/IP Reference model.
9. Write short note on
  - a. Twisted pair cable.
  - b. Coaxial cable.
  - c. Fiber optic cable.
10. List and explain different unguided transmission media.
11. Compare guided transmission and unguided transmission.
12. With neat diagram explain the information flow supporting virtual communication in layer5.

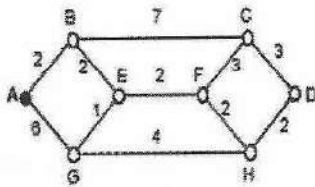
## MODULE – 2 & 3

### Assignment Questions

1. List and explain the design issues of Data Link Layer?
2. What is Hamming code. Encode the data or message bits 0011 into the 7-bits even parity Hamming code.
3. Illustrates the calculation for a frame 1101011111 using the generator  $G(x) = x^4 + x + 1$ . 4. Write the algorithm for computing the CRC. Suppose that the sender wants to send 4 frames each of 8 bits, where the frames are 11001100, 10101010, 11110000, 11000011.
5. Write a short note on:
  - a. Binary convolutional codes.
  - b. Reed-Solomon codes.
6. Explain Simplex Stop-and-Wait protocol for an Error-Free channel?
7. Explain Simplex Stop-and-Wait protocol for a Noisy channel?
8. Discuss about
  - a. Go-Back-N ARQ.
  - b. Selective repeat ARQ.
9. List and explain the design issues of Network Layer?
10. Define Routing. Find the Shortest Path using distance vector algorithm.



11. Difference between Virtual-Circuit and Datagram Network.
12. Find Shortest path routing algorithm for the following graph.





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**CITY ENGINEERING COLLEGE**

FIRST INTERNAL TEST

COURSE CODE: 21CS52

BRANCH: CS, IS  
COURSE NAME: COMPUTER NETWORKS  
SEM: V [A, B, C, & D]  
DURATION: 1 hr 30 min's

DATE: 03/01/2024  
TIME: 2:30 P.M to 4:00 P.M

MAX MARKS: 40

Note: Answer any FOUR questions choosing at least one from each part with neat Diagrams.

Q.No	PART-A	Marks	CO'S	BT'S
1.	Define Computer Networks. List and explain uses of Computer Networks.	10	1,2	1
<b>OR</b>				
2	Explain client-server interaction in connection oriented network with neat diagram.	10	2	2
<b>PART-B</b>				
3	Write a short note on a. PAN b. LAN c. MAN d. WAN	10	1,2	1,2
<b>OR</b>				
4	a. With neat diagram explain the information flow supporting virtual communication in layer 5. b. Explain the Design issues of the layers.	6 4	2	1,2
<b>PART-C</b>				
5	Distinguish between connection-oriented and connection-less services.	10	1,2	2
<b>OR</b>				
6	Compare guided transmission and unguided transmission.	10	1,2	1,2
<b>PART-D</b>				
7	Explain OSI Reference model with a neat diagram.	10	2	1,2
<b>OR</b>				
8	Write short note on a. Twisted pair cable. b. Coaxial cable. c. Fiber optic cable.	10	2	1,2

Bloom's Taxonomy Level: BT1-Remembering, BT2-Understanding, BT3-Applying, BT4-Analysing, BT5- Evaluating, BT6-Creating

**Course Outcomes:**

CO 1. Learn the basic needs of communication system.

CO 2. Interpret the communication challenges and its solution.

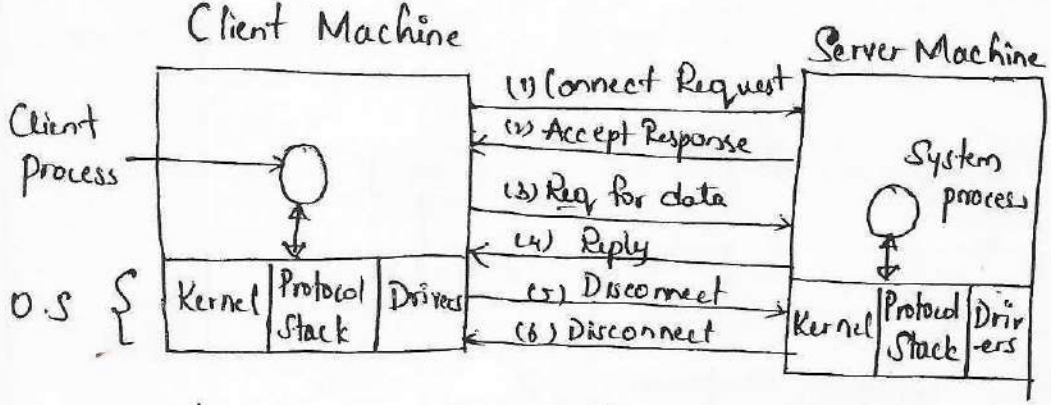
CO 3. Identify and organize the communication system network components

CO 4. Design communication networks for user requirements.

**CITY ENGINEERING COLLEGE**  
 DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING  
**SCHEME FOR EVALUATION**  
**CIE TEST - I**

SEMESTER & SECTION: V "D"

DATE: 02/01/24

Q. No	Details of the Answer	Marks Distribution	Total marks
1.	<p>A Computer Networks is a group of interconnected nodes or computing devices that exchange data and resources with each other.</p> <p>USES OF COMPUTER NETWORKS:</p> <ul style="list-style-type: none"> <li>* BUSINESS APPLICATIONS</li> <li>* HOME APPLICATIONS.</li> <li>* MOBILE USERS.</li> <li>* SOCIAL ISSUES.</li> </ul> <p style="text-align: right;">EXPLAIN</p>	<p>2 M</p> <p>2 M + 6 M</p>	<p>10 M</p>
2.	 <p style="text-align: center;">fig: Client - Server Interaction using Ack datagram</p> <p>→ Initialization, Client Request, Datagram Ack, Server Processing, Server Response, Client Processing, Interaction Completion.</p>	<p>4 M</p> <p>6 M</p>	<p>10 M</p>

Staff Signature:

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Q.No	Details of the Answer	Marks Distribution	Total marks
	<p>Layer 5 → Message Production            Layer 4 → Transport layer            Layer 3 → Network layer            Layer 2 → Data Link            Layer 1 → Physical</p> <p>EXPLAIN</p>	<p>2+ 4M</p>	<p>10M</p>
<p>4 b)</p>	<p>Design Issues for layers</p> <ul style="list-style-type: none"> <li>- Addressing</li> <li>- Error Control</li> <li>- flow control</li> <li>- Multiplexing</li> <li>- Identify receiver &amp; sender</li> </ul> <p>EXPLAIN</p>	<p>4M</p>	
	<p>5) <u>Connection Oriented</u></p> <ul style="list-style-type: none"> <li>* It is related to the telephone system.</li> <li>* Connection-Oriented Service is necessary.</li> <li>* It is feasible</li> </ul> <p>Ex: TCP</p> <p>[Explain any 8 points]</p>	<p><u>Connection-less Service</u></p> <ul style="list-style-type: none"> <li>* It is related to the postal system.</li> <li>* It is not compulsory</li> <li>* It is not feasible</li> </ul> <p>Ex: UDP</p>	<p>10M</p> <p>10M</p>

Q.No	Details of the Answer	Marks Distribution	Total marks
8.	<p>a) <u>Twisted Pair</u>:</p> <p>- It is the most common form of wiring in data communication applications.</p> <p>And List the Advantages &amp; Disadvantages</p> <p>b) <u>COAXIAL PAIR CABLE</u>:</p> <p>Explain &amp; List the Advantages &amp; Disadvantages</p> <p>c) <u>fibre Optic</u>:</p> <ul style="list-style-type: none"> <li>- Explanation</li> <li>- List the Advantages &amp; Disadvantages</li> </ul>	<p>3M</p> <p>3M</p> <p>4M</p>	<p>10M</p>

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# CITY ENGINEERING COLLEGE

SECOND INTERNAL TEST

COURSE CODE: 21CS52

BRANCH: CS, IS

DATE: 15/02/2024

COURSE NAME: COMPUTER NETWORKS

TIME: 2:30 P.M to 4:00 P.M

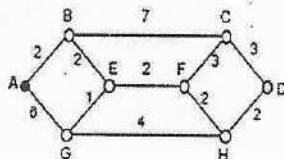
SEM: V [A, B, C, & D]

DURATION: 1 hr 30 min's

MAX MARKS: 40

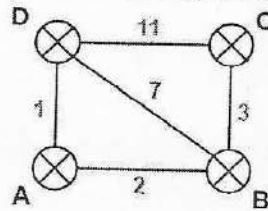
Note: Answer any FOUR questions choosing at least one from each part with neat Diagrams.

Q.No	PART-A	Marks	CO'S	BT'S
1.	Define Framing. Explain the methods of Framing.	10	1,4	1,2
<b>OR</b>				
2	Write a Short note on a. Simplex Stop-and-Wait protocol for an Error -Free channel. b. Simplex Stop-and-Wait protocol for a Noisy channel.	5 5	1,4	1,2
<b>PART-B</b>				
3	Write the algorithm for computing the CRC. Illustrates the calculation for a frame 1101011011 using the generator $G(x) = x^4 + x + 1$ .	4 6	3	3,4
<b>OR</b>				
4	Suppose that the sender wants to send 4 frames each of 8 bits, where the frames are 11001100, 10101010, 11110000, 11000011. Find the Checksum.	10	3	3,4
<b>PART-C</b>				
5	List and explain the design issues of Network Layer?	10	4	1
<b>OR</b>				
6	Discuss about a. Go-Back-N ARQ. b. Selective repeat ARQ.	5 5	4	1
<b>PART-D</b>				
7	a. Difference between Virtual-Circuit and Datagram Network. b. Find Shortest path routing algorithm for the following graph.	4 6	1,3	3,4



P.T.O

OR				
8	Define Routing. Find the Shortest Path using distance vector algorithm.	10	1,3	3,4



Bloom's Taxonomy Level: BT1-Remembering, BT2-Understanding, BT3-Applying, BT4-Analysing, BT5- Evaluating, BT6-Creating

Course Outcomes:

- CO 1. Learn the basic needs of communication system.
- CO 2. Interpret the communication challenges and its solution.
- CO 3. Identify and organize the communication system network components.
- CO 4. Design communication networks for user requirements.



# CITY ENGINEERING COLLEGE

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

SCHEME FOR EVALUATION

CIE TEST II

SEMESTER & SECTION: V

DATE: 14/02/24

Q. No	Details of the Answer	Marks Distribution	Total marks
1.	<p>framing is a process of dividing a stream of data into smaller, and more manageable units is known as <u>framing</u>.</p> <p>The methods of framing are:</p> <ul style="list-style-type: none"> <li>- Byte Count.</li> <li>- flag bytes with byte stuffing.</li> <li>- flag bytes with bit stuffing.</li> <li>- Physical Layer coding violations.</li> </ul>	<p>2 M</p> <p>8 M</p>	10M
2.	<p>(a)</p> <p style="text-align: center;">Fig. (a) Stop-and-wait protocol for an Error-free channel</p>	<p>2 + 3 M</p>	

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Q.No	Details of the Answer	Marks Distribution	Total marks
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(b) Explanation with Diagram.

2+3 M

10M

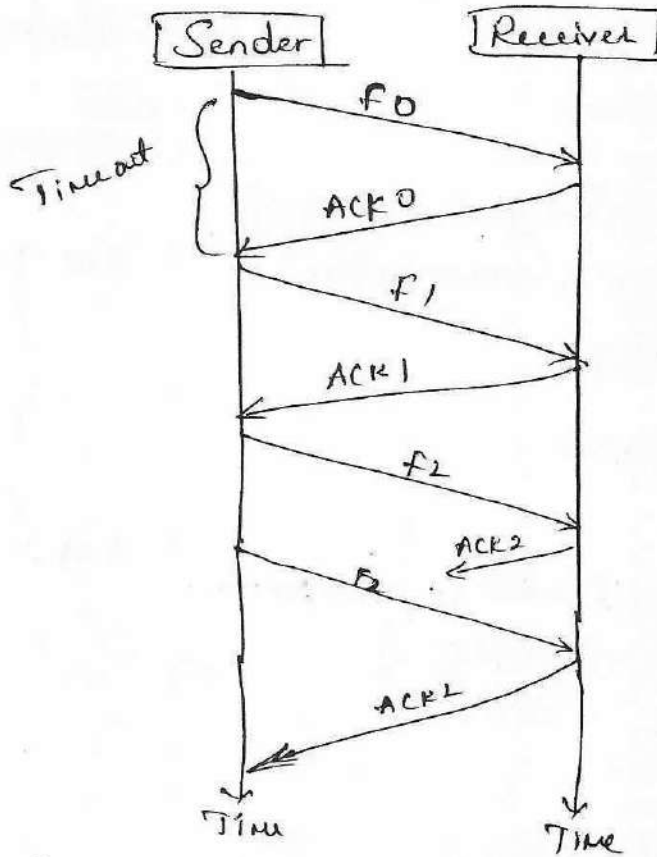


fig (b) Stop-and-wait - protocol for Noisy channel

3. The algorithm for Computing the CRC

4M

\* Let  $r$  be the degree of  $g(x)$ . Append  $r$  zero bits to the low-order end of the frame so it now contains  $m+r$  bits & corresponds to the polynomial  $x^r M(x)$

\* Divide the bit string with the given data using XOR Gate.

\* Append the remainder to the ~~the~~ original data & Encode.



Q. No	Details of the Answer	Marks Distribution	Total marks
4.	<div style="text-align: center;"> <math display="block">\boxed{11001100 \quad   \quad 10101010 \quad   \quad 11110000 \quad   \quad 11000011}</math> <p style="text-align: center;">1                      2                      3                      4</p> </div> <p>Given:</p> <p><math>k = 4</math> blocks</p> <p><math>m = 8</math> bits</p> <p><u>A sender Side</u></p> <p>① → 1100<sup>1</sup>1100</p> <p>② → 10101010</p> <p style="margin-left: 20px;"> <math>\boxed{1}01110110</math>  <math>\xrightarrow{+1}</math>  <math>\overset{000}{0}1110111</math> </p> <p>③ → 11110000</p> <p style="margin-left: 20px;"> <math>\boxed{1}01100<sup>1</sup>1<sup>1</sup>1</math>  <math>\xrightarrow{+1}</math>  <math>\overset{000}{0}1101000</math> </p> <p>④ → 11000011</p> <p style="margin-left: 20px;"> <math>\boxed{1}001010<sup>1</sup>1</math>  <math>\xrightarrow{+1}</math> </p> <p>Sum 00101100</p> <p>Complement</p> <p style="margin-left: 20px;">1100011</p> <p>After getting the sum it is complemented &amp; then we get the checksum</p> <p>Checksum = 1100011</p> <p style="text-align: center;"><u>At Receiver Side</u></p> <p>① → 110<sup>1</sup>01100</p> <p>② → 10101010</p> <p style="margin-left: 20px;"> <math>\boxed{1}01110110</math>  <math>\xrightarrow{+1}</math>  <math>\overset{000}{0}1110111</math> </p> <p>③ → 11110000</p> <p style="margin-left: 20px;"> <math>\boxed{1}01100<sup>1</sup>1<sup>1</sup>1</math>  <math>\xrightarrow{+1}</math>  <math>\overset{000}{0}1101000</math> </p> <p>④ → 11000011</p> <p style="margin-left: 20px;"> <math>\boxed{1}001010<sup>1</sup>1</math>  <math>\xrightarrow{+1}</math> </p> <p style="margin-left: 20px;"> <math>00101100</math>  <math>11010011</math> — Add  <math>\xrightarrow{\text{Checksum}}</math>  <math>11111111</math> Sum  <math>00000000</math> </p> <p>Now, the final sum is complemented, then we get the result 00000000</p> <p>∴ if the result is 0, there is no error in the transmitted data. So the receiver accepted the data</p>	<p style="text-align: center;">1M</p> <p style="text-align: center;">9M</p>	

Staff Signature:

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# CITY ENGINEERING COLLEGE

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

## SCHEME FOR EVALUATION

CIE TEST -----

SEMESTER & SECTION:

DATE:

Q. No	Details of the Answer	Marks Distribution	Total marks
5.	<p>Network Layer Design Issues:</p> <ul style="list-style-type: none"> <li>- Store &amp; forward Switching</li> <li>- Services Provided to the transport Layer</li> <li>- Implementation of Connectionless Service</li> <li>- Implementation of Connection-Oriented Service</li> </ul> <p style="text-align: center;">Explanation with Diagrams</p>	<p>2M</p> <p>8M</p>	10M
6.	<p>a) <u>Go-Back-N-ARQ</u></p> <p>It is the sequence numbers are modulo <math>2^m</math>, where <math>m</math> is the size of the sequence number field in bits.</p> <p style="text-align: center;">with <u>Diagram</u> Explanation</p> <p>b) <u>Selective Repeat ARQ</u></p> <p>In noisy links if one frame is damaged then only damaged frame is resent is known as Selective Repeat ARQ</p> <p style="text-align: center;">with <u>Diagram</u> Explanation</p>	<p>5M</p> <p>5M</p>	10M

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Q.No	Details of the Answer	Marks Distribution	Total marks
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7. a) Virtual-Circuit

- Quality of Services is Difficult

- Congestion control is Difficult

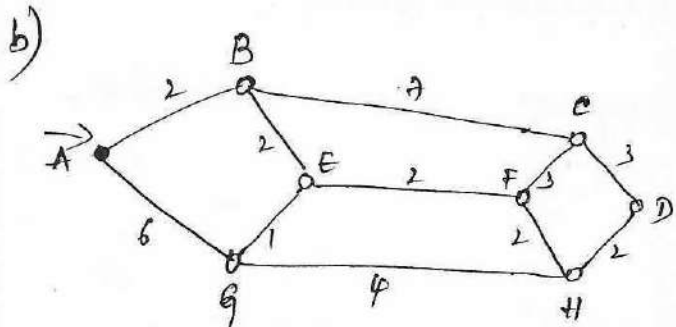
Any 5 points.

Datagram Network

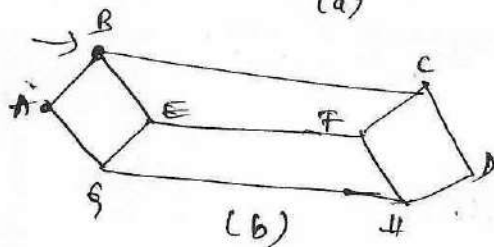
- QoS is Easy

- Easy

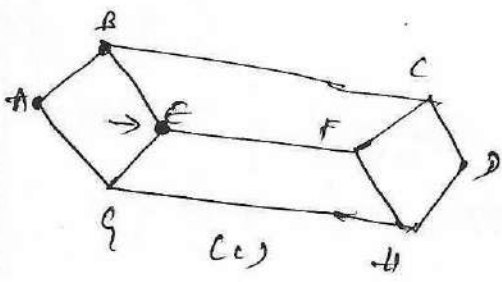
4



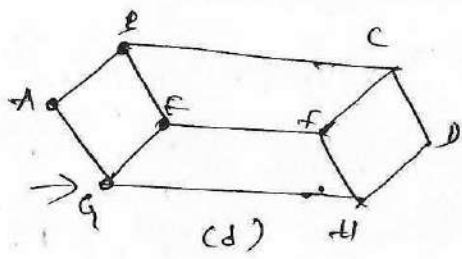
(a)



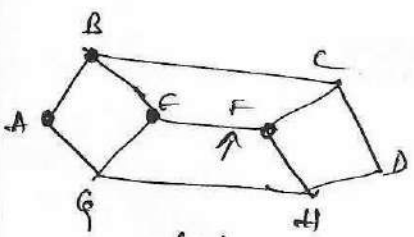
(b)



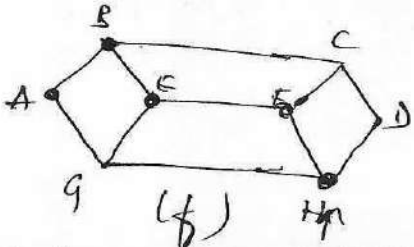
(c)



(d)



(e)



(f)

5M

10M

∴ The shortest path is A-B-E-F-G

1M

Download

any

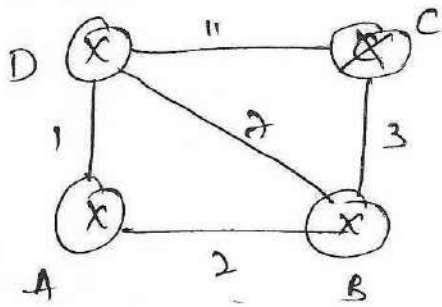
Q.No

Details of the Answer

Marks Distribution

Total marks

8.



Step 1: 1 Hop

Router A

Dest	Cost	Next Hop
A	0	A
B	2	B
C	$\infty$	-
D	1	D

Router B

Dest	Cost	Next Hop
A	2	A
B	0	B
C	3	C
D	7	D

Router C

Dest	Cost	Next Hop
A	$\infty$	-
B	3	B
C	0	C
D	4	D

Router D

Dest	Cost	Next Hop
A	1	D
B	7	B
C	11	C
D	0	D

Step 2: 2 Hop's

Step 3: 3 Hop's

10M

10M

Shubham

My



USN

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# CITY ENGINEERING COLLEGE

THIRD INTERNAL TEST

COURSE CODE:21CS52

BRANCH:CS,IS

DATE: 12/03/2024

COURSE NAME:COMPUTER NETWORKS

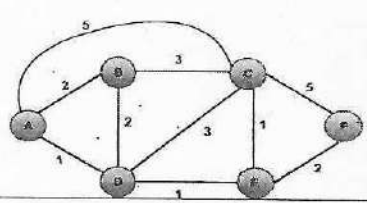
TIME: 2:30 P.M to 4:00P.M

SEM:V [C & D]

DURATION:1 hr 30 min's

MAX MARKS:40

Note: Answer any FOUR questions choosing at least one from each part with neat Diagrams.

Q.No	PART-A	Marks	CO'S	BT'S
1.	Write the Link State algorithm and apply it to the following graph with source node 'A'.  	10	4	3
<b>OR</b>				
2	a. Compare link state and distance vector routing. b. Explain Broadcast Routing and Multicast Routing.	5 5	4	3
<b>PART-B</b>				
3	Elaborate the Three-way handshake?	10	4	4
<b>OR</b>				
4	Write the difference between a. HTTP and FTP. b. TCP AND UDP.	10	4	4
<b>PART-C</b>				
5	Explain Client server and peer to peer architecture.	10	4	3,4
<b>OR</b>				
6	Explain HTTP Message Format with neat diagram.	10	4	3,4
<b>PART-D</b>				
7	Illustrate the basic operation of SMTP with an example.	10	4	3,4
<b>OR</b>				
8	Explain the services offered by DNS and also explain the DNS record and message format.	10	4	3,4

Bloom's Taxonomy Level: BT1-Remembering, BT2-Understanding, BT3-Appling, BT4-Analysing, BT5- Evaluating, BT6-Creating

Course Outcomes:

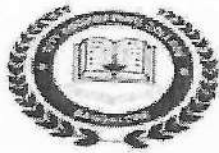
CO 1. Learn the basic needs of communication system.

CO 2. Interpret the communication challenges and its solution.

CO 3. Identify and organize the communication system network components

CO 4. Design communication networks for user requirements.



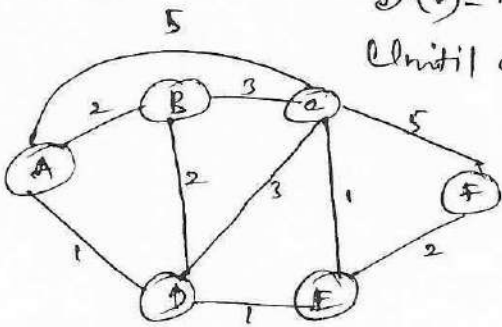


DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING  
**SCHEME FOR EVALUATION**

CIE TEST --- 3 ---

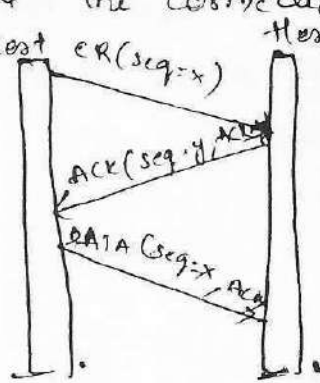
SEMESTER & SECTION: 5

DATE:

Q. No	Details of the Answer	Marks Distribution	Total marks
1	<p>Algorithm:</p> <p>Initialization <math>N = \{A\}</math>            for all nodes <math>V</math>,            if <math>V</math> adjacent to <math>A</math>            then <math>D(V) = c(A, V)</math>            else <math>D(V) = \text{infinity}</math>            loop.            find <math>w</math> not in <math>N</math> such that <math>D(w)</math> is            a minimum            Add <math>w</math> to <math>N</math>            update <math>D(V)</math> for all <math>V</math> adjacent to <math>w</math> not in <math>N</math>  <math>D(V) = \min(D(V), D(w) + c(w, V))</math>            Until all nodes in.</p> 	<p>4 m.</p> <p>6 m.</p>	<p>10 m</p>
<p>3 (a)</p>	<p><u>Linked state</u></p> <p>Explains any 6 points            * Bellmanford algo used</p>	<p><u>Distanced vectors</u></p> <p>Explains any 6 points.            * Dijkstra's algorithm used.</p>	<p>5 m.</p>

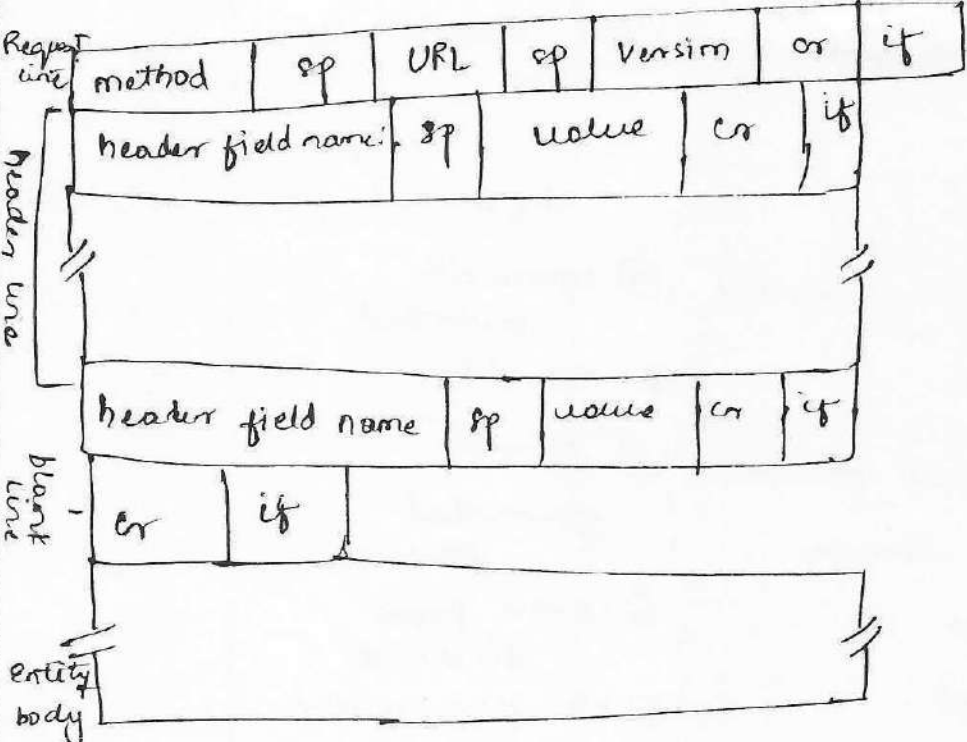
Staff Signature:

*[Signature]*  
HOD

Q. No	Details of the Answer	Marks Distribution	Total marks
2 (b)	<p>Broadcast routing :-</p> <ul style="list-style-type: none"> <li>→ Host needs to send messages to many or all other hosts.</li> <li>→ Sending a packet to all destinations simultaneously is called Broadcasting</li> </ul> <p>Multicast Routing :-</p> <ul style="list-style-type: none"> <li>→ A way to send messages to well defined groups.</li> <li>→ Sending a message to such group is called multicasting</li> </ul>	5 M	10 M
3	<p>Three-way Handshake :-</p> <p>Involves one peer checking with the other that the connection requested is indeed current</p> 	10 M	10 M
4.	<p>→ Multiple TM. TCP segmentation.</p>		

Q.No	Details of the Answer	Marks Distribution	Total marks
[4]			
(I)	<p>HTTP</p> <ul style="list-style-type: none"> <li>⊙ The term HTTP is a short form of Hyper Text Transfer protocol</li> <li>⊙ It provides support for the connection of Data</li> <li>⊙ It runs on port 80 of TCP</li> <li>⊙ It is capable of efficiently transferring various small files</li> </ul>	<p>FTP</p> <ul style="list-style-type: none"> <li>⊙ The term FTP is a short form of File transfer protocol</li> <li>⊙ It supports both control connection as well as Data connection</li> <li>⊙ It runs on port 20 &amp; 21 of TCP</li> <li>⊙ It can easily transfer large files with chunks of data.</li> </ul>	5m
(II)	<p>UDP</p> <ul style="list-style-type: none"> <li>⊙ connection less oriented</li> <li>⊙ not reliable</li> <li>⊙ It will not provide guaranteed services</li> <li>⊙ error free</li> <li>⊙ flow control</li> </ul>	<p>TCP</p> <ul style="list-style-type: none"> <li>⊙ connection oriented</li> <li>⊙ reliable</li> <li>⊙ provide guaranteed services</li> <li>⊙ error percent discarded.</li> <li>⊙ no flow control</li> </ul>	5m
			10M

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Q.No	Details of the Answer	Marks Distribution	Total marks
(5)	<p>Client - Server architecture -</p> <p>Clients :</p> <p>Explanation</p> <p>Server :</p> <p>Explanation</p> <p>P2P architecture</p> <p>Explanation</p>	10M	10M
(5)	<p>HTTP Message format</p>  <p>Request line: method   sp   URL   sp   version   cr   lf</p> <p>Header line: header field name   sp   value   cr   lf</p> <p>Header line: [blank]</p> <p>Header line: header field name   sp   value   cr   lf</p> <p>Blank line: cr   lf</p> <p>Entity body: [blank]</p> <p>Explanation →</p>	10M	10M

Q.No	Details of the Answer	Marks Distribution	Total marks
(7)	<p>SMT P</p> <p>⊛ Diagram →</p> <p>⊛ SMTP transfer messages from sender's mail server - to the reception mail servers.</p> <p>Below ex illustrates the basic of SMTP suppose Alice wants to send a Bob is simple ASCII messages.</p> <p>Brief Explanation →</p>	10M	10M
(8)	<p>(*) Host aliasing → A host can have more than one (or) more alias names. Canonical hostname is used by DNS.</p> <p>(*) Mail server aliasing - It is desirable that e-mail addresses must be mnemonic.</p> <p>(*) Load distribution - DNS is used to perform load distribution among replicated servers</p> <p>Diagram →</p>	10M	10M

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## ATTENDANCE

Sl. No.	Reg. No.	Name
1	ICEAITS001	Abhishek . K
2	ICEAITS002	Akash kumar
3	ICEAITS003	Anoop S.N
4	ICEAITS004	Danshan . M
5	ICEAITS005	Dhanush N.S
6	ICEAITS006	Gagan . P
7	ICEAITS007	Gautham . S
8	ICEAITS008	Kanakalakshmi
9	ICEAITS009	Kavana . U
10	ICEAITS010	Mani Bhargathi . S
11	ICEAITS011	Neezekonda Maranatha Rao
12	ICEAITS012	Punith kumar M.S
13	ICEAITS013	Radhika . S. Paragond
14	ICEAITS014	Rakshitha R
15	ICEAITS015	Ramapuram chethan
16	ICEAITS016	Sabrin fathima
17	ICEAITS017	Saisha Chakravathy . S
18	ICEAITS018	Sathish . V
19	ICEAITS019	Shivakumar . N
20	ICEAITS020	Sparthi . B
21	ICEAITS021	Thanuja . S
22	ICEAITS400	Dhawan . J
23	ICEAITS401	Shreya Durgayya Gond
24		
25		
No. of Absents		
Initials		

## ASSESSMENT

Sl. No.	Test Marks					Sessional Marks	Remarks		
	T1	T2	T3	AV	AYL		Theory	Practical	
	1	2	3	4	5				
1	38	38	34	18	10	20	48	28	20
2	39	36	37	19	10	20	49	29	20
3	33	36	36	18	10	20	48	28	20
4	<del>35</del> 38	33	18	10	19	47	28	29	
5	39	38	39	19	10	20	49	29	20
6	22	04	08	08	10	10	24	18	10
7	30	26	14	12	10	10	32	22	10
8	39	39	40	20	10	20	50	30	20
9	31	20	22	13	10	20	43	23	20
10	30	00	12	08	10	10	24	18	10
11	38	06	40	14	10	20	44	24	20
12	38	36	36	18	10	20	48	28	20
13	38	30	40	18	10	20	48	28	20
14	39	38	39	19	10	20	49	29	20
15	38	33	40	19	10	20	49	29	20
16	39	40	40	20	10	20	50	30	20
17	38	38	31	18	10	20	48	28	20
18	24	24	23	12	10	20	42	22	20
19	31	15	14	10	10	19	39	20	19
20	39	36	39	19	10	20	49	29	20
21	39	00	34	12	10	19	41	22	19
22	30	36	37	17	10	20	47	27	20
23	38	36	36	18	10	20	48	28	20
24									
25									



# LESSON PLAN

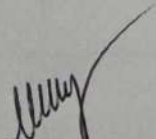
Week	Date		Topics Planned
	From	To	

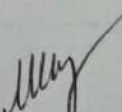
Week	Date		Topics Planned
	From	To	
I	27-11-23	1-12-23	<b>Module1:</b> Introduction <b>Introduction to networks:</b>
II	4-12-23	8-12-23	Network hardware, Network software, Reference models,
III	11-12-23	15-12-23	<b>Physical Layer:</b> Guided transmission media, Wireless transmission
IV	18-12-23	22-12-23	<b>Module-2 :</b> The Data link layer: Design issues of DLL,
V	25-12-23	29-12-23	Error detection and correction,
VI	1-01-24	5-01-24	Elementary data link protocols, Sliding window protocols.
VII	8-01-24	12-01-24	<b>The medium access control sublayer:</b> The channel allocation problem, Multiple access protocols.
VII	15-01-24	19-01-24	Revision ; <b>FIRST CIE</b>
IX	22-01-24	27-01-24	<b>Module-3 : The Network Layer:</b> Network Layer Design Issues, Routing Algorithms
X	29-01-24	2-02-24	Congestion Control Algorithms, QoS.

# LESSON PLAN

Week	Date		Topics Planned
	From	To	

Week	Date		Topics Planned
	From	To	
XI	5-02-24	9-02-24	<b>Module 4:</b> The Transport Layer: The Transport Service, Elements of transport protocols, Congestion control, The internet transport protocols.
XII	12-02-24	16-02-24	<b>SECOND CIE</b>
XIII	19-02-24	23-02-24	<b>Module 5: Application Layer:</b> Principles of Network Applications,
XIV	26-02-24	1-03-24	The Web and HTTP, Electronic Mail in the Internet,
XV	4-03-24	8-03-24	DNS—The Internet's Directory Service.
16-03-2024			Last Working Day

  
**FACULTY**


  
**HOD**


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**HOD'S Signature**

# RECORD OF CLASS WORK

Date	Period	Topics Covered
		<b>Module 1</b>
1	27/11/23	Introduction
2	29/11/23	Introduction to networks: Network hardware,
3	04/12/23	Network software
4	06/12/23	Reference models
5	07/12/23	Guided transmission media
6	11/12/23	Wireless transmission
7	13/12/23	Introduction to TCL scripts
8	14/12/23	Implement Three nodes point – to – point network with duplex links between them for different topologies. Set the queue size, vary the bandwidth, and find the number of packets dropped for various iterations. (Program 1)
		<b>Module 2</b>
9	18/12/23	The Data link layer: Design issues of DLL,
10	20/12/23	Error detection and correction,
11	21/12/23	Elementary data link protocols,
12	27/12/23	Sliding window protocols.
13	28/12/23	The medium access control sublayer: The channel allocation problem,
14	04/01/24	Multiple access protocols.
15	08/01/24	Implement simple ESS and with transmitting nodes in wireless LAN by simulation and determine the throughput with respect to transmission of packets
16	10/01/24	Write a program for error detecting code using CRC-CCITT (16-bits).

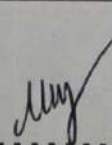
  
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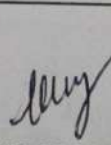
  
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# RECORD OF CLASS WORK

Date	Period	Topics Covered
		<b>Module 4</b>
24	31/01/24	The Transport Layer: The Transport Service,
25	01/02/24	Elements of transport protocols,
26	08/02/24	Congestion control,
27	12/02/24	The internet transport protocols.
28	14/02/24	The internet transport protocols.
29	15/02/24	Implement an Ethernet LAN using n nodes and set multiple traffic nodes and plot congestion window for different source / destination.
30	19/02/24	Write a program for congestion control using a leaky bucket algorithm.
31	21/02/24	Application Layer:
32	22/02/24	Principles of Network Applications,
33	26/02/24	The Web, HTTP,
34	28/02/24	Electronic Mail in the Internet,
35	29/02/24	DNS—The Internet's Directory Service.

  
 .....  
**Teacher's Signature**

  
 .....  
**HOD'S Signature**



# CITY ENGINEERING COLLEGE

Approved by AICTE New Delhi & Affiliated by VTU, Belagavi  
Doddakallasandra, Off Kanakapura Main Road,  
Next to Gokulam Apartment, Bangalore - 560 062.



## DEPARTMENT OF MASTER OF BUSSINESS ADMINISTRATION

### DEPARTMENT ADVISORY COMMITTEE

**Date:** 16/04/2024

**Time:** 10.30 AM

**Venue:** HOD cabin

#### DAC Members Present:

S.No	Name	Dept / Designation	Role
1	Prof. Rajesh R	Prof & HOD , MBA Dept	Convenor
2	Prof. Deepak I	Assistant Professor, MBA Dept	Member
3	Prof. H N Madhusudhana	Assistant Professor, MBA Dept	Member
4	Prof. Chaithra M S	Assistant Professor, MBA Dept	Member
5	Prof. Vidya Papat	Assistant Professor, MBA Dept	Member
6	Prof. Ankitha Rashminath	Assistant Professor, MBA Dept	Member

The Department Advisory Committee meeting was conducted at Department of MBA , on 11<sup>th</sup> April 2024, at 10:30 am.

#### Agenda of the Meeting:

- Discussion on conducting certification courses and opportunities that arise
- Conduction of societal project
- Industrial Visit
- Conduction of guest lectures/ workshops



# CITY ENGINEERING COLLEGE

Approved by AICTE New Delhi & Affiliated by VTU, Belagavi  
Doddakallasandra, Off Kanakapura Main Road,  
Next to Gokulam Apartment, Bangalore - 560 062.



## Minutes of Meeting:

Department Advisory Committee meeting and provided an overview of the department, highlighting student achievements, faculty accomplishments and contributions. The members discussed suggestions for improvement and the meeting agenda.

The Committee proposed the following inputs for the agenda:

- Discussion on conducting certification courses such as NPTEL and opportunities that arise
- Conduction of societal project after the 1<sup>st</sup> semester examination
- Industrial Visit to coco cola company to understand the working of different departments and the production process of coco cola
- Conduction of guest lectures/ workshops for the students to know about the industries and learn different skills.

**Dr. RAJESH . R**

**HOD & Convenor**

**Dr Rajesh R MBA Ph.D**  
**Professor & Head**  
**Department of ME**  
**City Engineering College**  
**Bengaluru**



CITY ENGINEERING COLLEGE  
DEPARTMENT OF MANAGEMENT STUDIES  
COMPETENCY MATRICES



ACADAMIC YEAR:2024-2025

SEM: II/EVEN

SL NO	STAFF NAME	Dr.Rajesh R, M.B.A,Ph.D				Mr.H.N.Madhusudhana, M.B.A, MSc				Mr. Deepak J, M.B.A, PGDMM				Mrs.Chaitra.M.S, M.Com,M.B.A				Mrs.Vidya popat,M.B.A				Ms.Ankitha Rashminath, M.B.A							
		A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D				
FIRST YEAR/ II SEM																													
1	22MBA21 & Human Resources Management							✓				✓		✓						✓									
2	22MBA22 & Financial Management											✓								✓									
3	22MBA23 & Research Methodology and IPR							✓				✓				✓								✓				✓	
4	22MBA24 & Operations Research																												✓
5	22MBA25 & Strategic Management							✓								✓								✓				✓	
6	22MBA26 & Managerial Economics								✓								✓											✓	
7	22MBA27 & Societal Project																												

Note\*

- 1.Subject Name Should Mentioned on the Basis of Easy to Tough
2. A-Highly Confident B-Confident C-Average D-Unsure

HOD/MBA  
**Dr Rajesh R MBA. Ph.D**  
Professor & Head  
Department of MBA  
City Engineering College  
Bengaluru

PRINCIPAL  
PRINCIPAL  
**CITY ENGINEERING COLLEGE**  
Kanakapura Main Road, BANGALORE - 560 061





# ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ

(ವಿ.ಟಿ.ಯು. ಅಧಿನಿಯಮ ೧೯೯೪ ರ ಅಡಿಯಲ್ಲಿ, ಕರ್ನಾಟಕ ಸರ್ಕಾರದಿಂದ ಸ್ಥಾಪಿತವಾದ ರಾಜ್ಯ ವಿಶ್ವವಿದ್ಯಾಲಯ)

## Visvesvaraya Technological University

(State University of Government of Karnataka Established as per the VTU Act, 1994)

"Jnana Sangama" Belagavi-590018, Karnataka, India



**Dr. T.N. Sreenivasa**

BE.,ME.,PhD.,FIE.,CEng.

**Registrar (Evaluation)**

**Phone : (0831) 2498131**

**Fax : (0831) 2498184**

Ref.No/VTU/Exam/QPDS/CW(2)/2024-2025/ 221

Date: 15 MAY 2024

### CIRCULAR

#### Sub: Time Table for I-Semester, PG Examination, Dec.2023/Jan.2024.

The Time Table for eligible students of I - Semester, CBCS-2022 Scheme, M.Tech./MBA/MCA/M.Plan./M.Arch./M.Sc. Examination Dec.2023/Jan.2024, is published herewith and is also available on the VTU Website <https://vtu.ac.in>.

The Principals of all the constituent and affiliated Engineering Colleges are requested to go through the time table and bring the contents of the same to the notice of all the concerned.

Sd/-  
Registrar (Evaluation)

To,

The Principals of all the affiliated Engineering Colleges and constituent Engineering College.

C.W.C. :

1. The Hon'ble Vice Chancellor, through the Secretary to VC, VTU, Belagavi, for kind information.
2. The Registrar, VTU, Belagavi, for kind information.
3. The Regional Directors, R.O. Bengaluru /Belagavi /Kalaburagi /Mysuru, for kind information.
4. The Director, ITISMU, VTU Belagavi, for information and needful.

Registrar (Evaluation)

*[Handwritten signature and date 15.5.24]*

## Visvesvaraya Technological University, Belagavi

**Time Table for I-Semester M.Tech./MBA/MCA/M.Arch./M.Plan./M.Sc. (CBCS-2022 Scheme) Examination, Dec.2023/Jan.2024**

Date, Day	M.Tech. / M.Tech (University Dept)	MBA	UBA	MCA	VMC	M.Plan. (TCP)	M.Arch. (Habitat Design)	M.Arch. (Urban Design)	M.Arch. (Digital Arch.)	M.Arch. (CPM)	M.Arch. (Interior Design)	M.Sc.
	I - Semester	I - Semester	I - Semester	I - Semester	I - Semester	I - Semester	I - Semester	I - Semester	I - Semester	I - Semester	I - Semester	I - Semester
	2.00pm to 5.00pm	2.00pm to 5.00pm	2.00pm to 5.00pm	2.00pm to 5.00pm	2.00pm to 5.00pm	2.00pm to 5.00pm	2.00pm to 5.00pm	2.00pm to 5.00pm	2.00pm to 5.00pm	2.00pm to 5.00pm	2.00pm to 5.00pm	2.00pm to 5.00pm
18-06-2024, Tue	22***11	22MBA11	22UBA11	22MCA11	22VMC11	22TCP12	22HDC12	22UDC13	22DAC13	22CPM12	22AID13	22MSC11
20-06-2024, Thu	22***12	22MBA12	22UBA12	22MCA12	22VMC12	22TCP13	22HDC13	22UDS14	22DAS16	22CPM13	22AID16	22MSC12
24-06-2024, Mon	22***13	22MBA13	22UBA13	22MCA13	22VMC13	22TCP15	22HDS16	22UDS15	--	22CPM14	--	22MSC13
26-06-2024, Wed	22***14	22MBA14	22UBA14	22MCA14	22VMC14	22TCP16	--	22UDS16	--	22CPM16	--	22MSC14
28-06-2024, Fri	22***15	22MBA15	22UBA15	22MCA15	22VMC15	--	--	--	--	--	--	22MSC15
01-07-2024, Mon	22RMI16	22MBA16	22UBA16	22RMI18	22VMC16	--	--	--	--	--	--	22MSC16

**Registrar (Evaluation)**

for, Students notice

*[Handwritten Signature]*  
21/5/24



# CITY ENGINEERING COLLEGE

Department Of MBA FEB 2024

Time Table for 1<sup>ST</sup> SEM w.e.f 12.02.2024 Room No: - Admin block 004 (Ground Floor)

DAY	9:00 - 10:00	10:00 - 11:00	11:10- 11:20	11:20-12:20	12:20-1:20	1:20- 2:00	2:00-3:00	3:00- 4:00	4:00-5:00	
MON	POB	BC	Short Break	MM	AFM	Lunch Break	ED	SFM	ACTIVITIES	
TUE	ED	POB		BC	MM		SFM	AFM	ACTIVITIES	
WED	AFM	SFM		POB	MM		BC	ED	SKILL DEVELOPMENT	
THU	SFM	BC		AFM	POB		ED	MM	LIBRARY	
FRI	CASE STUDY SESSION			PRESENTATION			MENTORING			
SAT	Sports period			Sports period			Sports Period			

Sl . No	Course Code	Course Name	Course	Faculty Name
1	22MBA11	Principles of Management and Organizational Behavior	POB	Prof. H N Madhusudhana
2	22MBA12	Entrepreneurship Development	ED	Prof. M S Chaithra
3	22MBA13	Accounting for managers	AFM	Prof. Deepak. I
4	22MBA14	Statistics for managers	SFM	Dr. Kannan V
5	22MBA15	Marketing Management	MM	Prof. Ankitha Rashminath
6	22MBA16	Business Communication	BC	Prof. Vidya Karia
7	Audit Course	<b>Societal Project</b>	SP	Prof. Ankitha Rashminath
One Industrial Visit per Semester is Mandatory				

*V. Kaman*

HOD

*S. K. Anon*

PRINCIPAL



## CITY ENGINEERING COLLEGE

Department Of MBA FEB 2024

Time Table for 1<sup>ST</sup> SEM w.e.f 12.02.2024 Room No: - Admin block 004 (Ground Floor)

Faculty Name: H N Madhusudhana

DAY	9:00 - 10:00	10:00 - 11:00	11:10- 11:20	11:20-12:20	12:20-1:20	1:20- 2:00	2:00-3:00	3:00- 4:00	4:00-5:00
MON	POB		Short Break			Lunch Break			ACTIVITIES
TUE		POB							ACTIVITIES
WED				POB					SKILL DEVELOPMENT LIBRARY
THU					POB				
FRI	CASE STUDY SESSION			PRESENTATION				MENTORING	
SAT	Sports period			Sports period				Sports Period	

**Dr Rajesh R. MBA., Ph.D**  
 Professor & Head  
 Department of M.E.  
 City Engineering College,  
 Bengaluru

<b>Principles of Management and Organisational Behaviour</b>			
<b>Course Code</b>	<b>22MBA11</b>	<b>CIE Marks</b>	<b>50</b>
<b>Teaching Hours/Week (L:P:SDA)</b>	<b>4:0:0</b>	<b>SEE Marks</b>	<b>50</b>
<b>Total Hours of Pedagogy</b>	<b>50</b>	<b>Total Marks</b>	<b>100</b>
<b>Credits</b>	<b>04</b>	<b>Exam Hours</b>	<b>03</b>
<b>Course Objectives:</b> This course will enable the students			
<ul style="list-style-type: none"> <li>• To understand theories and models of Management and OB,</li> <li>• To classify and differentiate between various methods of problem solving.</li> <li>• To compile an adept framework for solving the problems at the workplace.</li> <li>• To acquaint the students with industry relevant skill sets.</li> </ul>			
<b>Module-1 (8 Hours)</b>			
<b>Introduction:</b> Meaning, Objectives, Differences between Administration and Management, Levels of Management, Kinds of Managers, Managerial roles, History of Management, Recent trends in Management.			
<b>Module-2 (9 Hours)</b>			
<b>Planning:</b> Importance, Process, Benefits of Planning, Types of Plans, Planning tools and techniques.			
<b>Organising:</b> Meaning, Types of Organisation structures, Traditional structures, Directions in organisation structures.			
<b>Leading:</b> Meaning, Nature, Traits and Behaviour, Contingency approaches to Leadership, Transformational leadership.			
<b>Controlling:</b> Meaning, Importance, Steps in the control process, Types of Control.			
<b>Module-3 (9 Hours)</b>			
<b>Organisational Behaviour:</b> Introduction, Meaning, History of Organisational Behaviour, Organisational effectiveness, Organisational learning process, Stakeholders, Contemporary challenges for Organisations.			
<b>Module-4 (9 Hours)</b>			
<b>Behavioural Dynamics:</b> MARS Model of individual behaviour and performance, Types of Individual behaviour, Personality in Organisation, Values in the work place, Types of values, <b>Perception,</b> Meaning, Model of Perceptual process. Emotions in work place, Types of emotions, Circumplex Model of Emotion, Attitudes and Behaviour, Work-related stress and its management. <b>Motivation,</b> Meaning, Maslow's Hierarchy of Needs, Four Drive Theory of Motivation.			
<b>Module-5 (9 Hours)</b>			
<b>Teams:</b> Advantages of Teams, Model of Team Effectiveness, Stages of Team Development. Power, Meaning, Sources, and Contingencies of Power, Consequences of Power.			
<b>Module-6 (7 Hours)</b>			

**Culture:** Meaning, Elements of Organisational Culture, Importance of Organisational Culture. Organisational Change , Meaning, Resistance to change, Approaches to Organisational Culture, Action Research Approach, Appreciative Inquiry Approach, Large Group Intervention Approach, Parallel Learning Structure Approach, and Ethical issues of Organisational Behaviour.

**Assessment Details (both CIE and SEE)**

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing marks for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements (passed) and earned the credits allotted to each course if the student secures not less than 50% in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

**Continuous Internal Evaluation:**

There shall be a maximum of 50 CIE Marks. A candidate shall obtain not less than 50% of the maximum marks prescribed for the CIE.

**CIE Marks shall be based on:**

- a) Tests (for 25Marks) and
- b) Assignments, presentations, Quiz, Simulation, Experimentation, Mini project, oral examination, field work and class participation etc., (for 25 Marks) conducted in the respective course. Course instructors are given autonomy in choosing a few of the above based on the subject relevance and should maintain necessary supporting documents for same.

**Semester End Examination:**

The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.

- The question paper will have 8 full questions carrying equal marks.
- Each full question is for 20 marks with 3 sub questions.
- Each full question will have sub question covering all the topics.
- The students will have to answer five full questions; selecting four full question from question number one to seven in the pattern of 3, 7 & 10 Marks and question number eight is compulsory.

**Suggested Learning Resources:**

**Books**

1. MGMT ,Chuck Williams & Manas Ranjan Tripathy, 5/e, Cengage Learning, 2013.
2. Organizational Behavior,Steven L. McShane & Mary Ann Von Glinow, 6/e, McGraw Hill Education, 2015.
3. Management & Organisational Behaviour , Laurie J. Mullins, 7/e, Prentice Hall, 2005.
4. Essentials of Management , Koontz, McGraw Hill, 8/e, 2014.
5. Management, John R. Schermerhorn, Jr., 8/e, Wiley India, 2010.

6. Organizational Behaviour, Fred Luthans, 12/e, McGraw Hill International, 2011.

**Web links and Video Lectures (e-Resources):**

- [https://onlinecourses.nptel.ac.in/noc22\\_mg104/preview](https://onlinecourses.nptel.ac.in/noc22_mg104/preview)
- [https://onlinecourses.nptel.ac.in/noc22\\_mg78/preview](https://onlinecourses.nptel.ac.in/noc22_mg78/preview)
- [https://learninglink.oup.com/access/king-lawley3e-student-resources#tag\\_all-chapters](https://learninglink.oup.com/access/king-lawley3e-student-resources#tag_all-chapters)
- <https://openstax.org/details/books/organizational-behavior>
- <https://www.classcentral.com/course/introduction-organisational-behaviour-11892>

**Note:** The aforesaid links and study material are suggestive in nature, they may be used with due regards to copy rights, patenting and other IPR rules.

**Skill Development Activities Suggested**

- Visit an Organisation and note the various functions discharged in a day.
- Conduct a professional event in the department and try to understand the various roles played by students in relation to Team and Organisational environment.
- Develop questions, interact with people in the Organisation and try to observe personality traits.
- Meet any Leader / HoD / Dean and observe the Management of various departments and record the changes in administrative pattern.

**Course outcome**

At the end of the course the student will be able to:

Sl. No.	Description	Blooms Level
CO1	Gain practical experience in the field of Management and Organisational Behaviour.	L1
CO2	Acquire conceptual knowledge of management, various functions of Management and theories in OB.	L3
CO3	Comprehend and apply management and behavioural models to relate attitude, perception and personality.	L2
CO4	Analyse the recent trends in Management and OB models.	L4

**Mapping of COs and POs**

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4
CO1	1				2	3			
CO2		2	2				2		
CO3				3		3		2	
CO4		2		2			1		2



**CITY ENGINEERING COLLEGE, BENGALURU-560061. ACADEMIC CALENDAR 2023-24 EVEN SEM 12/02/2024**

FEB 2024		MARCH 2024		APRIL 2024		MAY 2024		JUNE 2024		JULY 2024		AUGUST 2024		
DAY	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT
MON					1						1			
TUE					2						2			
WED					3						3			
THU	1				4		1	Holiday - May Day			4			
FRI	2				5	"Talents Day" for IInd Sem Students	2	Ethnic Day			5		1	
SAT	3	1st Saturday Holiday			6	1st Saturday Holiday	3	College Day			6		2	
SUN	4		2	1st Saturday Holiday	7		4	1st Saturday Holiday	1	1st Saturday Holiday	7		3	1st Saturday Holiday
MON	5		3		8		5		2		8		4	
TUE	6		4		9		6		3	3 <sup>rd</sup> June to 20 <sup>th</sup> June 2024 Theory Examination of I Sem MBA/MCA/M. Tech	9		5	
WED	7		5		10	Holiday - Chandramana Ugadi	7		4		10		6	
THU	8		6		11		8		5		11		7	
FRI	9		7		12	Holiday - Qutub-e-Ramzan	9		6		12		8	
SAT	10		8	Holiday - Maha Shiva Ratri	13		10	Holiday - Basava Jayanthi	7		13		9	
SUN	11		9		14	Alumni Meet	11		8		14		10	
MON	12	Commencement of Classes of I Sem MBA	10		15		12		9		15		11	
TUE	13		11		16		13		10		16		12	
WED	14		12		17		14		11		17		13	
THU	15		13		18		15		12		18	Holiday - Mubarram	14	
FRI	16		14		19	MBA/MCA/M.Tech Industrial Visit	16	MBA Subject Viva	13		19		15	Holiday - Independence Day
SAT	17	3 <sup>rd</sup> Saturday Holiday	15		20	3 <sup>rd</sup> Saturday Holiday	17	3 <sup>rd</sup> Saturday Holiday	14		20	3 <sup>rd</sup> Saturday Holiday	16	
SUN	18		16		21		18		15		21		17	3 <sup>rd</sup> Saturday Holiday
MON	19		17		22		19		16		22		18	
TUE	20		18		23		20		17	Holiday - Bakrid	23		19	
WED	21		19		24		21	MBA III Test 21 <sup>st</sup> may to 23 <sup>rd</sup> may	18		24		20	
THU	22		20		25	25 <sup>th</sup> to 27 <sup>th</sup> April 24, II Test MBA	22	INTERNALS	19		25		21	
FRI	23		21		26	INTERNALS	23	INTERNALS	20		26		22	
SAT	24		22		27	INTERNALS	24		21		27		23	
SUN	25		23		28		25	Last Working Day of I Sem MBA/MCA/M. Tech	22	Graduation Day	28		24	
MON	26		24	25 <sup>th</sup> to 27 <sup>th</sup> March 24, I Test MBA	29		26		23		29		25	
TUE	27		25	INTERNALS	30	Sports Day	27		24		30		26	
WED	28		26	INTERNALS			28		25	Commencement of Classes of II Sem MBA			27	
THU	29		27				29		26		31		28	
FRI			28				30		27				29	
SAT			29	Holiday - Good Friday			31		28				30	
SUN			30						29				31	
			31						30					

Note: 1. Students Feedback should be taken immediately after the Test. 2. There will be no additional circular will be sent for dates mentioned for Events in CoE



# CITY ENGINEERING COLLEGE

BRANCH/COURSE: MBA

List of Students Admitted to I Year I Semester -2023-2024

Sl.No	Name of the Student	USN		
1	ABHISHEK S R	1CE23BA001		
2	AISHWARYA N	1CE23BA002		
3	AISHWARYA Y R	1CE23BA003		
4	AKSHITHA G	1CE23BA004		
5	AMRUTHA K N	1CE23BA005		
6	AMRUTHA N	1CE23BA006		
7	ANITHA K	1CE23BA007		
8	ANJALI K A	1CE23BA008		
9	ARCHANA	1CE23BA009		
10	ASHWINI D	1CE23BA010		
11	AZAM HUSSAIN	1CE23BA011		
12	BABUREDDY	1CE23BA012		
13	BHARAMAPPA B	1CE23BA013		
14	BHARATH J G	1CE23BA014		
15	BHARATH P AITHAL	1CE23BA015		
16	BHASKARA H D	1CE23BA016		
17	BHAVYASHREE T	1CE23BA017		
18	BINDU S	1CE23BA018		
19	CHAITHRA K	1CE23BA019		
20	CHANDRIKA J	1CE23BA020		
21	CHIRAYU S P	1CE23BA021		
22	DEVIKA M	1CE23BA022		
23	DHANRAJ S	1CE23BA023		
24	DHANUSH V	1CE23BA024		
25	DILEEP T	1CE23BA025		
26	GANESH S	1CE23BA026		
27	GEETHA	1CE23BA027		
28	GURUKIRAN R	1CE23BA028		
29	HEMANTH R	1CE23BA029		
30	KALPANA A	1CE23BA030		
31	KARTHIK C M	1CE23BA031		
32	KARTHIK R	1CE23BA032		
33	KEERTHANA S B	1CE23BA033		
34	M B H NIZAMULLA	1CE23BA034		
35	MADHURA R	1CE23BA035		
36	MAMATHA R	1CE23BA036		

# CITY ENGINEERING COLLEGE

BRANCH/COURSE: MBA

List of Students Admitted to I Year I Semester -2023-2024

Sl.No	Name of the Student	USN		
1	ABHISHEK S R	1CE23BA001		
37	MANJUNATHA A S	1CE23BA037		
38	MANJUNATHA K	1CE23BA038		
39	NAVYA K	1CE23BA039		
40	NETHRA B	1CE23BA040		
41	NITHIN H K	1CE23BA041		
42	NITHIN V	1CE23BA042		
43	NITHYASHREE S	1CE23BA043		
44	PAVITHRA S	1CE23BA044		
45	POOJA	1CE23BA045		
46	PRAJWAL K U	1CE23BA046		
47	PRAMUKHA H L	1CE23BA047		
48	PREMANATH NAIK	1CE23BA048		
49	PRIYA K M	1CE23BA049		
50	RANJITHA M	1CE23BA050		
51	RENUKA K	1CE23BA051		
52	SHARATH J V	1CE23BA052		
53	SHASHANK S	1CE23BA053		
54	SHREYANK S SHIRUR	1CE23BA054		
55	SIDDHARAJU L	1CE23BA055		
56	SINDHU N	1CE23BA056		
57	SONU S M	1CE23BA057		
58	SRIDHAR S	1CE23BA058		
59	SRUSTITH B D	1CE23BA059		
60	SUCHITHRA T	1CE23BA060		
61	SUDEEP B B	1CE23BA061		
62	VENKATARAMANASWAMY P N	1CE23BA062		

Signature of HOD

Dr Rajesh R MBF Ph.D  
Professor & Head  
Department of MBA  
City Engineering College  
Bengaluru

Signature of Principal

PRINCIPAL  
CITY ENGINEERING COLLEGE  
Kanakapura Main Road, BANGALORE - 560 061

## CBCS SCHEME

USN

22MBA1

**First Semester MBA Degree Examination, Jan./Feb. 2023**  
**Principles of Management and Organizational Behavior**

Time: 3 hrs.

Max. Marks: 100

*Note: 1. Answer any FOUR full questions, choosing ONE full question from each module.  
 2. M: Marks, L: Bloom's level, C: Course outcomes.  
 3. Question No. 8 is compulsory.*

		M	L	C
Q.1	a. Define the term Management.	3	L1	CO1
	b. Explain the process of controlling with a flowchart.	7	L3	CO2
	c. Appraise Henry Fayol's 14 principles of management.	10	L4	CO3
Q.2	a. What do you mean by leadership?	3	L1	CO1
	b. Assess the steps involved in planning process.	7	L3	CO2
	c. Examine in detail the managerial roles by Henry Mintzberg.	10	L2	CO3
Q.3	a. Define Organizing.	3	L1	CO1
	b. Identify the difference between Management and Administration.	7	L3	CO3
	c. What is divisional organization structure? Discuss the advantages and disadvantages of divisional organization structure.	10	L3	CO2
Q.4	a. Define Organizational Behaviour.	3	L1	CO1
	b. Briefly explain the MARS model of individual behavior.	7	L2	CO3
	c. Analyze the stages of team development.	10	L4	CO2
Q.5	a. What do you mean by Personality?	3	L1	CO1
	b. Explain the contemporary challenges with respect to organizational behavior.	7	L4	CO4
	c. Discuss Maslow's Need Hierarchy theory and Four drive theory of motivation.	10	L1	CO2
Q.6	a. State the advantages of Team.	3	L2	CO4
	b. Explain the sources of power in organizations.	7	L2	CO3
	c. Determine action research approach to organizational change.	10	L3	CO2

22MBA11					
Q.7	a. What are the types of Attitude?	3	L2 CO2		
	b. Briefly explain the reasons for resistance to change and strategies to minimize the resistance to change.	7	L4 CO3		
	c. Elaborate the model of Perceptual Process.	10	L2 CO2		
Q.8	<p style="text-align: center;"><b>CASE STUDY (Compulsory)</b></p> <p>Rajesh, an IIMB graduate, was appointed as the CEO of Techno consultancy Ltd. Techno developed software packages for finance companies and banks. The ambience of Techno consultancy was rather relaxed with a flat organizational structure. Being a software house, it was natural for programmers and managers to mingle freely with each other. The company promoted a friendly unstructured atmosphere to gel with its nature of business. The average age of a techno employee was 25-27 years. Before Rajesh took over as the CEO, Suraj Sharma, an IITian, was heading Techno consultancy for nearly 4 years. Suraj Sharma was known for his down-to-earth and amicable approach. Out of the total staff of 167 employees, anyone could walk up to him and freely discuss his problems with him. He enjoyed the week-end "Film hours" with his employees when the company would give snacks and tea to all the employees and allow them time and space to enjoy themselves. Techno consultancy has seen a steady growth under him, which intangible terms meant an increase in business turnover of up to Rs.85 crores. His decision to leave for USA came as a shock to all the employees and when the new appointee Rajesh joined techno consultancy, there was apprehension in the air. Rajesh of course, had an excellent track record, with a sound computer engineering degree and the added management qualification from IIMB.</p> <p>Within a few days of taking charge Rajesh introduced a few changes. He saw no value in "Film hours" and decided to discontinue this practice. He also insisted that employees first check with his personal assistant and then meet him. Moreover, when one of the programmers remained absent for more than 2 days without any intimation, Rajesh used strong words to communicate his displeasure to Vasista, the project leader, to whose team the programmer belonged. Vasista obviously found Rajesh strongly opinionated because he realized that Rajesh was not prepared to buy his explanation for the absence. One particular project team ran into trouble chasing the deadline. Rajesh minced no words in communicating to the project manager, Rahul, that if the project was not completed within next 2 weeks, then he may be forced to assign the project to another team. Ofcourse, by now the office 'grapevine' was a buzz that Rajesh has an 'Attitude' problem. In the meanwhile, Rahul resigned along with two other programmers from his team. During the first 6 months, the company showed a slight drop in its profitability. The company's employee turnover went up by whopping 10%. The managing director, Mr. Sadhashiva Murthy was a worried man, he invited Rajesh for a meeting to discuss the issue.</p> <p><b>Questions:</b></p> <p>a. Identify various problems in the leadership style of Rajesh.</p> <p>b. Analyze the leadership style of Suraj Sharma.</p> <p>c. If you were Mr. Sadhashiva Murthy, what course of action you would have initiated.</p> <p>d. In this context state the qualities of a ideal leader.</p>		5 5 5 5	L5 L5 L5 L5	CO4 CO4 CO4 CO4

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**CBCS SCHEME**

USN 

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20MBA11

**First Semester MBA Degree Examination, July/August 2022  
Management and Organizational Behaviour**

Time: 3 hrs.

Max. Marks: 100

**Note:** 1. Answer any **FOUR** full questions from Q. No. 1 to 7.  
2. Q.No. 8 is compulsory.

Important Note: 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and/or equations written eg. 4, 2-8, 50, will be treated as malpractice.

- |          |   |
|----------|---|
| <b>1</b> | <ul style="list-style-type: none"> <li>a. Define Management. <span style="float: right;">(03 Marks)</span></li> <li>b. Explain the different skills and competencies of a Manager. <span style="float: right;">(07 Marks)</span></li> <li>c. Explain Henry Fayol's principles of management. <span style="float: right;">(10 Marks)</span></li> </ul>   |
| <b>2</b> | <ul style="list-style-type: none"> <li>a. Define Planning. <span style="float: right;">(03 Marks)</span></li> <li>b. Write a note on different types of controlling. <span style="float: right;">(07 Marks)</span></li> <li>c. Explain the different types of organizational structure. <span style="float: right;">(10 Marks)</span></li> </ul>  |
| <b>3</b> | <ul style="list-style-type: none"> <li>a. Define Organizational Behaviour. <span style="float: right;">(03 Marks)</span></li> <li>b. Explain the perceptual process with a neat block diagram. <span style="float: right;">(07 Marks)</span></li> <li>c. Explain in detail the Myer-Briggs Type Indicator assessment of personality. <span style="float: right;">(10 Marks)</span></li> </ul>                                   |
| <b>4</b> | <ul style="list-style-type: none"> <li>a. State the components of Attitude. <span style="float: right;">(03 Marks)</span></li> <li>b. What are the different approaches to Organizational Behaviour? <span style="float: right;">(07 Marks)</span></li> <li>c. Explain Maslow's Need Theory and its application in management. <span style="float: right;">(10 Marks)</span></li> </ul>   |
| <b>5</b> | <ul style="list-style-type: none"> <li>a. State the meaning of Group Dynamics. <span style="float: right;">(03 Marks)</span></li> <li>b. Elucidate on the Five-stage model of group development. <span style="float: right;">(07 Marks)</span></li> <li>c. Explain the need for creating effective teams in a organization and state the reasons for the team failure. <span style="float: right;">(10 Marks)</span></li> </ul> |
| <b>6</b> | <ul style="list-style-type: none"> <li>a. Define Organizational Culture. <span style="float: right;">(03 Marks)</span></li> <li>b. What are the different sources of power for an individual? <span style="float: right;">(07 Marks)</span></li> <li>c. Explain the different types of organizational culture. <span style="float: right;">(10 Marks)</span></li> </ul>   |
| <b>7</b> | <ul style="list-style-type: none"> <li>a. State the meaning of organizational change. <span style="float: right;">(03 Marks)</span></li> <li>b. Explain the different types of stress. <span style="float: right;">(07 Marks)</span></li> <li>c. Explain the different forces responsible for change and how can we manage resistance to change in an organization. <span style="float: right;">(10 Marks)</span></li> </ul>    |

**8 Case Study (Compulsory):**

Mr. Anvesh is a supervisor in an engineering firm in Mumbai. Employee morale in his office is quite low. The workers now have gone back to their regular, 9:00 am to 5:00 pm work schedule, after being on flexi time for nearly 2 years. When the directive came, allowing Anvesh to place his office on flexi-time, he spelled out the rules carefully to his people. All the employees were to work during the core period from 9:00 am to 2:00 pm. However, they could work the rest of 8 hours day, any time between 9:00 am to 6:00 pm. Anvesh believed his workers were honest and motivated; so he did not bother to setup any system of control.

20MBA11

Everything went on well for a long time. Morale was high and all the work seemed to be done. In November 2015, the chief factory manager found that Anvesh's workers were averaging 7 hours a day. Two employees had been working only during the core period for more than 2 months. When Anvesh's departmental head received the factory manager's report, he told Anvesh to return to the regular working hours. Anvesh was upset and disappointed with his people. He had trusted them, but felt that they had let him down.

Questions:

- a. Do you think Anvesh failed to understand the behavior of his employees while controlling them? (05 Marks)
- b. Does flexi-time at work bring in productivity to the organization? (05 Marks)
- c. What techniques are to be adopted to boost employee morale at workplace? (05 Marks)
- d. What are the factors responsible for job related attitudes? (05 Marks)

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20MBA11

Why do so many promising Employees leave their Jobs? One of the two main reasons Kiran's reason – can be all but invisible because it is so common in so many Organisations – a system wide failure to keep good people.

Corporations should be concerned about Employees like Kiran. By investing in human capital, they may actually help to reduce turnover, protect training investments, increase productivity, improve quality and reap the benefits of innovative thinking and team work. Human Resource Professionals and Managers can contribute to corporate success by encouraging Employees empowerment, security, identity "connectedness" and competence. How? By recognizing the essential components of keeping their best people and by understanding what enhances and diminishes these components. Kiran doubt that his Company will ever change, but other organisations are taking steps to focus on and enhance Employee retention. As a result they are reducing turnover improving quality, increasing productivity and protecting their training investments.

Questions :

- a. Identify the problem in the case. (05 Marks)
- b. Explain the reasons for Kiran's decision to leave the Job. (05 Marks)
- c. What the Company could have done to retain the Employees like Kiran? (05 Marks)
- d. What lesson can this Company learn from the case of Kiran? (05 Marks)

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# CBCS SCHEME

USN

I C E 2 3 B A 0 1 5

22MBA11

**First Semester MBA Degree Examination, Dec.2023/Jan.2024**  
**Principles of Management and Organizational Behaviour**

Time: 3 hrs.

Max. Marks: 100

- Note: 1. Answer any FOUR full questions from Q.No.1 to Q.No.7.  
 2. Question No. 8 is compulsory.  
 3. M : Marks , L: Bloom's level , C: Course outcomes.*

			M	L	C
<b>Q.1</b>	a.	Mention the recent trends in Management.	03	L1	CO1
	b.	Briefly explain the functions of Management.	07	L2	CO2
	c.	Evaluate three implications of Maslow's Need Hierarchy Theory for Managers.	10	L3	CO3
<b>Q.2</b>	a.	Define controlling. Mention the types of controlling.	03	L1	CO1
	b.	Briefly explain the types of Span of Control.	07	L2	CO2
	c.	Analyze the importance of each step involved in Planning process.	10	L4	CO4
<b>Q.3</b>	a.	Differentiate between Instrumental and Terminal values.	03	L1	CO1
	b.	Briefly explain the contemporary challenges with respect to OB.	07	L2	CO2
	c.	Explain any 2 types of organization structures.	10	L3	CO3
<b>Q.4</b>	a.	Define Unity of Command.	03	L1	CO1
	b.	Explain the components of Attitude.	07	L2	CO2
	c.	Illustrate the significance of personality for managers referring to Big Five Personality model.	10	L4	CO4
<b>Q.5</b>	a.	Define Organizational Power.	03	L1	CO1
	b.	Elucidate the sources of organizational power.	07	L2	CO2
	c.	Elaborate the Internal and External environmental forces responsible for organizational change.	10	L5	CO3
<b>Q.6</b>	a.	What is transformational leadership?	03	L1	CO1
	b.	Briefly explain the model of Perceptual process.	07	L2	CO2
	c.	Briefly explain : (i) Appreciative Inquiry model. (ii) Parallel learning structures.	10	L4	CO3
<b>Q.7</b>	a.	Define Action Research Model.	03	L1	CO1
	b.	Define Organizational Culture. Explain the elements of culture.	07	L2	CO2
	c.	Illustrate the significance of Bruce Tuckman's stages of group formation.	10	L4	CO4

Q.8	<p>Case Study (Compulsory):</p> <p>An hypothetical company manufacturing appliances and goods like air conditioners, refrigerators, microwave ovens, washing machines is facing problems related to low performance. The company revenues are declining. The profits and market share also reducing. The production team points out the marketing for decline and not meeting the sales targets. The marketing blames production department for producing low quality products with complaints on quality by the customers. The finance department blames both production and marketing for declining return on investment and bad marketing.</p> <p>Questions :</p>			
	a. Analyze the performance gaps and suggest an appropriate organization structure to improve the performance of the firm, with the help of a flow chart.	10	L4	CO4
	b. Compile suitable recommendations/alternatives to enhance the performance of all the functional groups. Evaluate and select the best in terms of feasibility.	10	L5	CO4

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City Engineering College

Department of MBA

**Principle of Management & Organisational Behavior****QUESTION BANK****(RM – Reading Materials; SM – Supplementary Materials)**

Module	Sl No	Question	Marks	Ref.
Module 1	1	Define the term Management. (Page 1 of RM)	3	Feb 23
	2	What do you mean by Top Management (Page 4-5 of RM)	3	Model Paper
	3	What is Espirit Day corps? (Page 17 of RM)	3	Feb 21
	4	Mention the different managerial skills necessary for manager. (Page 4-5 of SM)	3	Feb 22
		What are the skills required by a Manager	3	Jan 17
	5	Identify the difference between Management and Administration. (Page 3-4 of RM)	7	Feb 23
	6	Briefly explain the recent trends in management Explain briefly the recent trends in management (Page 19-20 of RM)	7 7	Feb 21 Feb 22
	7	What is Management? Bring out four functions of management (Page 18 of RM)	7	Jan 19
	8.	List the Managerial Competencies (Page 4 of SM)	7	Aug 21
	9	Appraise Henry Fayols 14 principles of Management (Page 15-17 of RM)	10	Feb 23
	10	Examine in detail the Managerial roles by Henry Mintzberg. (Page 8-9 of RM)	10	Feb 23
	11.	Discuss the principles of scientific management. Critically evaluate it. (Page 13-14 of RM)	10	Jan 17
	12	Explain and discuss the functions of management with a flow chart. (Page 18 of RM)	10	Feb 23

<b>Module 2</b>	<b>1</b>	<b>Mention the types of plans (Page 4-9 of RM)</b>	<b>3</b>	<b>Feb 23</b>
<b>Planning</b>	<b>2</b>	<b>What do you mean by departmentalization (Page 17 of RM)</b>	<b>3</b>	<b>Jan 19</b>
	<b>3</b>	<b>What are the features of a good plan. (Page 1-2 of RM)</b>	<b>3</b>	<b>Jan 19</b>
	<b>4</b>	<b>What do you mean by Planning Premises. (Page 3 - 4 of RM)</b>	<b>3</b>	<b>Feb 21</b>
	<b>5.</b>	<b>Mention the essentials of a good plan. (Page 1-2 of RM)</b>	<b>3</b>	<b>Model Paper</b>
	<b>6.</b>	<b>Explain the tools and techniques of Planning (Page 9-12 of RM)</b>	<b>7</b>	<b>Aug 21</b>
	<b>7.</b>	<b>What is Decision Making? Explain its types (Page 9 of RM)</b>	<b>7</b>	<b>Feb 21</b>
	<b>8</b>	<b>Assess the steps involved in Planning Process Discuss in detail different steps in planning. (Page 3 - 4 of RM)</b>	<b>7</b> <b>7</b>	<b>Feb 23</b> <b>Model paper</b>
	<b>9.</b>	<b>What do you mean by corporate planning. (Page 5 of SM)</b>	<b>10</b>	<b>Jan 19</b>
<b>Organising</b>	<b>1</b>	<b>Define Organising (Page 12 of RM)</b>	<b>3</b>	<b>Feb 23</b>
	<b>2</b>	<b>What is unity of command? (Page 13 of RM)</b>	<b>3</b>	<b>Jan 20</b>
	<b>3</b>	<b>What is delegation of authority(Page 6 of RM)</b>	<b>3</b>	<b>Jan 20</b>
	<b>4</b>	<b>Elucidate the different types of Organisation Structure (Page 13-17 of RM)</b>	<b>7</b>	<b>Jan 17</b>
	<b>5</b>	<b>What are the different types of organization structure? Explain any 2 with a flow chart. (Page 14-16 of RM)</b>	<b>10</b>	<b>Feb 21</b>
	<b>6</b>	<b>Explain the functional organization structure(Page 15 of RM)</b>	<b>7</b>	<b>Aug 21</b>

	7	What are virtual organizations? State its advantages and disadvantages (Page 20 of RM)	7	Jan 20
	8	What do you mean by virtual organization? Discuss the benefits and limitations of virtual organisation (Page 20 of RM)	10	Jan 19
	9	Differentiate between formal and informal organization. (Page 13-19 of RM)	7	Jan 19
	10	What is divisional organization structure? Discuss its advantages and disadvantages. (Page 17 of RM)	10	Feb 23
	11	What do you mean by divisional organization structure. Discuss the basis and problems in divisional structure (Page 17 of RM)	10	Jan 19
	12	Define Span of control. (Page 7 of RM)  Explain the types of span of control.	3 7	Feb 23 Feb 21
	13	Explain different terms in Organisation (Page 6-7 of RM)	10	Feb 22
	14	Explain the functional organization structure (Page 15 of RM)	10	Aug 21
	15	Discuss the basic types of organization structures. (Page 14-16 of RM)	10	Feb 18
<b>Leading</b>	1	What do you mean by Leadership (Page 20 of RM)	3	Feb 23
	2	Explain few traits of good leaders. (Page 22-23 of RM)	3	Feb 21
	3	What do you mean by Free rein Leadership (Page 5 of RM)	3	Jan 19
	4	Discuss the principles of Directing Mention the principles of Directing (Page 8-9 of SM)	7 3	Aug 21 Feb 22
	5	Mention different types of Leadership (Page 27-29 of RM)  Discuss the different leadership styles	3 7	Jan 20 Jan 17

	6	Discuss Blake and Moutans theory of leadership (Page 26 of RM)	10	Feb 18
	7	State 4 leadership styles according to Likert. (Page 25-26 of RM) Explain the Blake and moutons model (Page 26 of RM)	10	Feb 21
	8	What is Managerial Grid? Explain Black and Moutons model of leadership (Page 26 of RM)	10	Jan 17
<b>Controlling</b>	1	State the meaning of controlling (Page 35 of RM)	3	Jan 19
	2	Explain the process of controlling with a flow chart. (Page 36-37 of RM) Define controlling. Explain with a flow chart the process of controlling.	7 10	Feb 23 Feb 21
	3	State the different types of controis. (Page 37-38 of RM) Explain different types of control	3 7	Feb 21 Feb 22
	4	Explain the steps in controlling process. Explain the process of control with a flow chart. (Page 36-37 of RM)	7 10	Feb 23 Aug 21
	5	Briefly explain the significance of controlling (Page 35 of RM)	7	Feb 21
	6	Outline the various steps involved in controlling process. (Page 36-37 of RM)	7	Jan 19
	7	Discuss the three types of control (Page 37-38 of RM)	7	Feb 18
	8	What are the different types of control systems used in the organizations (Page 37-38 of RM)	7	Jan 17
<b>Module 3</b>	1	Define Organisational Behavior Define OB (Page 1-2 of RM)	3 3	Feb 23 Jan 20
	2	Who is the father of Human Relations Movement (Page 4 of RM)	3	Model paper

	3	Explain the contemporary challenges wrt to organizational behavior. Describe the challenges and opportunities of OB (Page 15 - 18 of RM)	7 10	Feb 23 Feb 18
	4	Explain the levels of Organisation Behavior (Page 11-12 of SM)	7	Model Paper
	5	Explain the different disciplines contributing to OB (Page 2 - 3 of RM)	7	Feb 21
	6	Write a note on Hawthorne Experiment (Page 4 - 7 of RM)	7	Feb 18
	7	What are the levels of Organisational Effectiveness (Page 11 - 20 of SM)	7	Model Paper
	8	What are the issues in managing stake holders (Page 10 - 11 of SM)	10	Model Paper
<b>Module 4</b>	1.	Define individual behavior (Page 1 of RM)	3	Feb 21
	2	Briefly explain the MARS model of individual behavior. (Page 3-6 of RM)	7	Feb 23
	3	Explain the impact of group on individual behavior	7	Feb 23
	4	Explain the impact of group on individual behavior	7	Model paper
	5	State and explain the foundations of individual behavior (Page 3-6 of RM)	10	Jan 19
	6.	What do you mean by Personality (Page 7 of RM)	3	Feb 23
	7.	Define Personality. Explain MBTI. How does MBTI help managers (Page 11-14 of RM)	10	Feb 21
	8.	What is Personality? Explain in detail different determinants in shaping personality (Page 7-8 of RM)	7	Jan 19
		Elucidate the determinants of Personality	7	Jan 17
	9	What are the major personality attributes influencing OB (Page 19 - 21 of RM)	7	Model Paper
	10.	Compare Type A and Type B Personality (Page 21 of RM)	3	Feb 18

11.	Differentiate between Type A and Type B Personality (Page 21 of RM)	7	Feb 21
12.	Describe the different types of personality traits (Page 14-18 of RM)	7	Feb 18
13.	Describe the big five model of personality Discuss the Big Five Personality Traits State Big Five Personality Traits (Page 14 - 18 of RM)	7 7 3	Feb 18 Feb 22 Jan 17
14.	Explain five big personality traits (Page 14-18 of RM)	7	Feb 23
15.	Define Perception (Page 24 of RM)	3	Feb 23
16.	What is Stereo type (Page 28 of RM)	3	Jan 20
17.	Elucidate the factors influencing individual perception	10	Jan 20
18.	What do you mean by Perception (Page 24 of RM) Define Perception	3 3	Feb 21 Jan 20
19.	What is meant by halo effect (Page 27 of RM)	3	Jan 19
20.	State the nature of Perception (Page 26 of RM)	3	Model Paper
21.	What is the difference between Perception and Attitude	3	Model Paper
22.	Describe the factors influencing perception	10	Sample Paper
23.	Elaborate the model of perceptual process. Describe the process of perception (Page 24-25 of RM)	10 10	Feb 23 Aug 21
24.	Define Ability	3	Feb 18
25.	Discuss the intellectual abilities and physical abilities that determine the behavior. Explain the intellectual and physical abilities.	7 7	Jan 20 Feb 18
26.	What are the types of values	3	Model Paper
27.	What are the values in work place. What are their importance. (Page 34-36 of RM)	7	Model paper



	28	List the components of attitude (Page 33-34 of RM)	3	Aug 21
	29	Define Attitude (Page 36 of RM)	3	Feb 23
	30	Discuss how Attitudes are formed Describe the components of Attitude (Page 33-34 of RM)	7 7	Jan 20 Feb 18
	31.	What are the types of attitude (Page 34-35 of RM)	3	Feb 23
	32.	Explain the relation between attitude and behavior	7	Feb 21
	33.	What is group dynamics (Page 16 of SM)	3	Feb 23
	34.	Explain the classification of groups	7	Feb 23
	35.	Explain the impact of group on individual behavior. (Page 13 of SM)	7	Sample Paper
	36.	Define stress (Page 39 of RM)	3	Aug 21
	37.	Explain the types of stress and its causes (Page 42 - 44 of RM)	10	Feb 23
	38.	Explain the causes of stress (Page 42 - 44 of RM)	10	Aug 21
	39	What causes stress and how to overcome the stress (Page 44 - 46 of RM)	10	Feb 22
	40	Explain signs, symptoms and types of stress (Page 42 - of RM)	7	Sample Paper
	41.	Define Motivation (Page 47 of RM)	3	Feb 21
	42.	Explain the process of motivation (Page 47-50 of RM)	7	Feb 23
	43	Describe Maslow's need hierarchy theory four drive theory of motivation (Page 47-50 of RM)	10	Feb 23
	44.	Explain Maslow's need hierarchy theory. State any two advantages and disadvantages Explain Maslow's need hierarchy theory and its application in management. (Page 47-50 of RM)	10 10	Feb 21 Feb 18
	45	Differentiate between Theory X and Theory Y of motivation.	3	Jan 20

	46.	Explain the main features of Theory Y of motivation	7	Jan 19
	47.	Write short notes on Maslows need hierarchy theory (Page 47-50 of RM)	7	Jan 20
	48	Critically examine Maslows need hierarchy theory of motivation. (Page 47-50 of RM)	10	Jan 19
	49	Explain Herzbergs two factor theory (Page 15 -16 of SM)	7	Jan 20
		Discuss Herzbergs two factor theory of motivation and its managerial implications. (Page 15 -16 of SM)	10	Feb 18
	50.	Discuss in detail Trait theory of motivation	10	Jan 19
	51	Describe the four drive theory of motivation (Page 50-53 of RM)	7	Model paper
<b>Module 5</b>	1.	State the advantages of Teams (Page 5 of RM)	3	Feb 23
	2.	Write the difference between teams and groups (Page 2 of RM)	3	Aug 21
	3.	Explain the types of teams and its benefits (Page 3 & 4 of RM)	7	Aug 21
	4.	Explain in detail the process of Team work (Page 10 & 11 of RM)	10	Feb 23
	5.	Explain the dysfunctions of a team as enumerated in Lencioni model. (Page 9-10 of RM)	7	Sample paper
	6.	Analyse the stages of team development (Page 10 & 11 of RM)	10	Feb 23
	7.	Distinguish between Power and Authority (Page 13 of RM)	3	Sample paper
	8.	Explain the sources of power in organizations ( Page 14 of RM)	7	Feb 23
<b>Module 6</b>	1	Define Organisational culture ( Page 1 of RM)	3	Sample Paper
	2	Explain the steps in creating the organizational culture. ( Page 11-12 of RM)	7	Sample Paper
	3	Explain the strong versus weak culture. (Page 13 - 14 of SM)	7	Feb 23

	4	Define and explain the levels of organization culture ( Page 14 of SM)	10	Aug 21
	5	State the characteristics of change  What are the Characteristics of Change Management ( Page 13-14 of RM Types of change)	3 7	Sample Paper Feb 22
	6	Discuss the factors responsible for changes in organization. ( Page 13-14 of RM Same as above)	10	Feb 23
	7	Explain the change process (in organisations) ( Page 11-12 of RM)	7	Aug 21
	8	Briefly explain the reasons for resistance to change and strategies to minimize resistance ( Page 16-18 of RM)	7	Feb 23
		Briefly explain the reasons for resistance to change and strategies to minimize the resistance to change	10	Feb 23
	9	What are the benefits of resistance to change (Page 15 of SM)	7	Model paper
	10	Determine the Action research approach to organizational change. ( Page 19 - 23 of RM)	10	Feb 23
	11	Define Ethics (Page 13 of RM)	3	Model Paper
	12	Discuss how the organizational politics can be managed ( Page 33-34 of RM)	10	Feb 23

## Principles of Management and Organisation Behavior


## ASSIGNMENTS – 3

14<sup>th</sup> April 2024

No.	Due Date	Module	Assignment
<b>3 Marks Questions</b>			
1.	21-04-24	Module 3	Define Organisational Behavior
2.	21-04-24	Module 3	What is meant by Hawthorne effect?
3.	21-04-24	Module 3	What is the difference between Stake holders and Share holders
4.	21-04-24	Module 3	What is meant by Organisational effectiveness?
<b>7 Marks Questions</b>			
1.	21-04-24	Module 3	Explain the different disciplines contributing to OB
2.	21-04-24	Module 3	Explain the various Organizational Learning processes to improve the effectiveness.
<b>10 Marks Questions</b>			
1.	21-04-24	Module 3	Explain the contemporary challenges and opportunities wrt to organizational behavior.
2.	21-04-24	Module 3	Write a note on Hawthorne Experiment? What is the conclusion of the Hawthorne experiment?

The assignment may be completed before 21<sup>st</sup> April 2024



  
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## Principles of Management and Organisation Behavior

## ASSIGNMENTS – 4

19<sup>th</sup> April 2024

No.	Due Date	Module	Assignment
<b>3 Marks Questions</b>			
1.	27-04-24	Module 4	What is meant by halo effect?
2.	27-04-24	Module 4	What is Stereo type?
3.	27-04-24	Module 4	What do you mean by Perception
4.	27-04-24	Module 4	Define Stress.
5.	27-04-24	Module 4	Distinguish between Attitude and Behavior
6.	27-04-24	Module 4	What do you mean by Personality?
<b>7 Marks Questions</b>			
1.	27-04-24	Module 4	Briefly explain the MARS model of individual behavior.
2.	27-04-24	Module 4	Describe the big five model of personality
3.	27-04-24	Module 4	Differentiate between Type A and Type B Personality
4.	27-04-24	Module 4	What is Personality? Explain in detail different determinants in shaping personality
<b>10 Marks Questions</b>			
1.	27-04-24	Module 4	Explain MBTI. How does MBTI help managers
2.	27-04-24	Module 4	Explain the types of stress and its causes
3.	27-04-24	Module 4	Critically examine Maslows need hierarchy theory of motivation.
4.	27-04-24	Module 4	Explain the four drive theory of motivation

The assignment may be completed before 27<sup>st</sup> April 2024

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## Principles of Management and Organisation Behavior

## ASSIGNMENTS – 5

5<sup>th</sup> May 2024

No.	Due Date	Module	Assignment
<b>3 Marks Questions</b>			
1.	6 <sup>th</sup> May 2024	Module 5	Write the difference between teams and groups
2.	6 <sup>th</sup> May 2024	Module 5	What are cross functional teams?
3.	6 <sup>th</sup> May 2024	Module 5	Distinguish between Power and Authority
4.	6 <sup>th</sup> May 2024	Module 5	What is meant by contingencies of power?
5.	6 <sup>th</sup> May 2024	Module 5	Briefly mention the three consequences of power.
6.	6 <sup>th</sup> May 2024	Module 5	What is meant by self-managed teams?
<b>7 Marks Questions</b>			
1.	6 <sup>th</sup> May 2024	Module 5	Explain the types of teams and its benefits
2.	6 <sup>th</sup> May 2024	Module 5	Explain the sources of power for individuals in organisations
3.	6 <sup>th</sup> May 2024	Module 5	Write a brief note on nature and characteristics of Teams.
<b>10 Marks Questions</b>			
1.	6 <sup>th</sup> May 2024	Module 5	Deliberate on the various stages of Team development.
2.	6 <sup>th</sup> May 2024	Module 5	What is meant by Team effectiveness? Explain any two models of team effectiveness.
3.	6 <sup>th</sup> May 2024	Module 5	Explain the various inter-personal sources of power in organizations.

The assignment may be completed before 12<sup>th</sup> May 2024



  
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## Principles of Management and Organisation Behavior


## ASSIGNMENTS – 6

9<sup>th</sup> May 2024

No.	Due Date	Module	Assignment
<b>3 Marks Questions</b>			
1.	15 <sup>th</sup> May 2024	Module 6	Define Organisational culture
2.	15 <sup>th</sup> May 2024	Module 6	What do you understand by Whistle blowers in organizations.
3.	15 <sup>th</sup> May 2024	Module 6	What is meant by Club culture?
4.	15 <sup>th</sup> May 2024	Module 6	Define Unethical behavior in OB
5.	15 <sup>th</sup> May 2024	Module 6	What is meant by Pragmatic culture.?
6.	15 <sup>th</sup> May 2024	Module 6	What is Organisational change?
<b>7 Marks Questions</b>			
1.	15 <sup>th</sup> May 2024	Module 6	Explain the types of Organisation Culture
2.	15 <sup>th</sup> May 2024	Module 6	Discuss the various ethical issues in Organisation Behavior and their importance.
3.	15 <sup>th</sup> May 2024	Module 6	Discuss the process of Organisational Change.
4.	15 <sup>th</sup> May 2024	Module 6	Discuss the advantages and disadvantages of clan culture of organizations.
<b>10 Marks Questions</b>			
1.	15 <sup>th</sup> May 2024	Module 6	Discuss how the organizational politics can be managed
2.	15 <sup>th</sup> May 2024	Module 6	Briefly explain the reasons for resistance to change and strategies to minimize the resistance to change
3.	15 <sup>th</sup> May 2024	Module 6	Explain the Action research approach to organizational change.
4.	15 <sup>th</sup> May 2024	Module 6	Discuss the various elements of Organisation Culture.

The assignment may be completed before 15<sup>th</sup> May 2024



  
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## CITY ENGINEERING COLLEGE

### Internal test I - MBA 1<sup>st</sup> Semester

Course Name: POB  
Course Code : 22MBA11  
Course year : 2023-24

Date: 26<sup>th</sup> March 2024  
Duration: 90 minutes  
Max Marks: 50

## PRINCIPLES OF MANAGEMENT AND ORGANISATIONAL BEHAVIOR

### Course Outcomes and Blooms Level

SI No	Description of Course Outcome	Blooms Level
CO1	Gain practical experience in the field of Management and Organisational Behaviour	L1
CO2	Acquire conceptual knowledge of management, various functions of Management and theories in OB	L3
CO3	Comprehend and apply management and behavioural models to relate attitude, perception and personality	L2
CO4	Analyse the recent trends in Management and OB models	L4

Answer any TWO questions from Qn Nos. 1 to 4. Qn No. 5 is compulsory

Qn No.	Question	Marks	Course Outcome	Blooms Level	
1	a	What do you mean by Planning Premises	3	CO2	L3
	b	What are virtual organizations? State its advantages and disadvantages	7	CO4	L4
	c	Briefly mention Fayol's 14 principles of Management	10	CO2	L3
2	a	What is meant by Esprit de corps.	3	CO2	L3
	b	Explain the Management functions of Planning, Organizing, Directing and Controlling	7	CO2	L3
	c	Discuss the traits associated with great leaders.	10	CO3	L2
3	a	What is delegation of authority	3	CO2	L3
	b	Discuss the three types of managerial control	7	CO2	L3



	c	Explain the various key managerial roles in an organization	10	CO1	L1
4	a	What is meant by Total Quality Management	3	CO1	L1
	b	Write any 5 differences between Management and Administration	7	CO2	L3
	c	What are the different types of organization structure? Explain any 2 with a flow chart.	10	CO2	L3
5.		<b>Case Study</b>			
		<p>Mr. Subhash is a supervisor in an engineering company in Hyderabad. Morale in his office was quite low. The working hours was 9 am to 5 pm. Directive came from top management to allow flexi time for employees. Under the flexi time, all employees were to work 8 hours a day and the core working hours were fixed as 9 am to 2 pm and they could work the rest of 8 hours a day any time between 2 pm and 8 pm. Subhash believed his workers were honest and well motivated; so he did not bother to set up any system of control.</p> <p>After about 2 years, it was found that the average working hours were only 6 hours a day. The attendance during core period was only 70% of the total staff. Some people were found to be working only during the core period. With this state of affairs, top management was upset and decided to return to the earlier practice of regular working hours of 9 am to 5 pm. Subhash had believed and trusted his employees, but they had let him down.</p> <p><b>Questions:</b></p> <ol style="list-style-type: none"> <li>1. Why the employees misused the flexi hours introduced in the work place?</li> <li>2. Where did Mr Subhash went wrong in introducing the flexi hours?</li> <li>3. What is your assessment on the relationship between the supervisor and the workers and suggestions to improve?</li> </ol>			
			3	CO1	L1
			3	CO1	L1
			4	CO1	L4

## CITY ENGINEERING COLLEGE

### Internal test I - MBA 1<sup>st</sup> Semester

Course Name: POB  
Course Code : 22MBA11  
Course year : 2023-24

Date: 26<sup>th</sup> March 2024  
Duration: 90 minutes  
Max Marks: 50

## PRINCIPLES OF MANAGEMENT AND ORGANISATIONAL BEHAVIOR

### SCHEME OF EVALUATION

Qn No.	Question	Marks
i a	<p>What do you mean by Planning Premises</p> <p><i>The <u>assumptions on business environment about the future</u> is referred to as <u>planning premises</u>. It is a forecast that is created by taking current plans and any prior knowledge about various policies into account. The assumptions are established <u>based on forecasting</u>.</i></p>	3
b	<p>What are virtual organizations? State its advantages and disadvantages</p> <p><i>A virtual organization is an operation where all members of the company or organisation work in <u>different geographic locations while appearing as a single organizational entity</u>. It uses computers, software, phones and other technology to work together and converse in real-time, despite any physical distance. It is important for virtual organizations to establish detailed procedures that ensure consistency in employee performance and provide employees with the ample resources and support they need to conduct their responsibilities from remote locations.</i></p> <p><i>Then, explain about its advantages like lower overhead costs, improved employee satisfaction, improved efficiency, larger hiring market and flexible hours and disadvantages like difficulty in building organization culture, compliance and security issues, etc.,</i></p>	7
c	<p>Briefly mention Fayol's 14 principles of Management</p> <p><i>Henry Faryol is known as the <u>father of modern management theory</u>. His contribution is generally termed as <u>process management and administrative management</u>. Fayol looked at the problems from the <u>top management point of</u></i></p>	10

		<p>view.</p> <p>He proposed 14 principles of Management which includes Division of Labour: Parity of authority and Responsibility; Discipline: Unity of command: Unity of direction: Subordination of individual to general interest: Fair remuneration to employee: Centralisation and Decentralisation: Scalar chain: Order: Equity: Stability of tenure of personnel: Initiative: . Esprit de corps:</p> <p>Briefly mention about each of the above principles of management.</p>	
2	a	<p>What is meant by Esprit de corps.</p> <p>It is one of the principles of management proposed by Fayol and it is a French word meaning spirit of the body. It refers to team-spirit that is <u>harmony in work group and mutual understanding</u> among workers. Managers must take steps to develop a sense of belonging among the members of the work group.</p>	3
	b	<p>Explain the Management functions of Planning, Organizing, Directing and Controlling</p> <p>Planning, Organising, Directing and Controlling are the basic managerial functions in any organization.</p> <p><u>(a) Planning is the process of setting objectives for a given time period, formulating various courses of action to achieve them and then selecting the best possible alternative from among the various courses of action available. Thus, planning is goal oriented and futuristic. It provides the basis for controlling. No planning means no control on the activities of an organization. Mention about steps in Planning.</u></p> <p><u>(b) Organising is the process of identifying and grouping the work to be performed, defining and delegating responsibility and authority and establishing relationships for the purpose of enabling people to work most effectively together in accomplishing objectives'.</u></p> <p>An Organization Structure enables a group of people, coming with different backgrounds and working towards a common goal, to carry out defined tasks in a smooth and efficient way.</p> <p>Mention about the principles of Organisation.</p> <p><u>(c) Directing: is the process of providing overall directions for the organization in its day to day functioning and planning for future. Leadership is an important component of Directing. Leadership is about influencing and supporting others to work enthusiastically towards achieving objectives.</u></p> <p>Briefly mention about leadership qualities and leadership styles.</p> <p><u>(d) Controlling is a process of measuring and comparing the actual performance</u></p>	7

		<p><i>with the set standards of the company. analyse the variations and take corrective actions to ensure that activities are performed according to the plans. Controlling is considered to be an important function in achieving the organizational goals efficiently.</i></p> <p><i>Mention about three types of control namely Feedback control, Feed forward control and Concurrent control.</i></p>	
	c	<p><b>Discuss the traits associated with great leaders.</b></p> <p><i>Leaders are endowed with superior, unique or inherent qualities or naturally occurring tendencies, differentiating them from followers. According to the researchers, the traits most commonly associated with great leadership include Adaptability and flexibility: Assertiveness: Capacity to motivate people: Courage and resolution: Creativity: Decisiveness: Eagerness to accept responsibility: Emotional stability: Intelligence and action-oriented judgment: Need for achievement: People skills: Perseverance: Self-confidence: Task competence: Trustworthiness : Understanding their followers and their needs:</i></p> <p><i>Explain briefly each of the above traits.</i></p>	10
3	a	<p><b>What is delegation of authority</b></p> <p><i>Delegation of authority is the process of <u>transferring the authority from one person to another person in the chain of command</u> in order to ensure smooth functioning of the organization. Authority is the <u>power and right of an individual</u> to use and allocate their resources efficiently. It includes the <u>ability to make decisions and give orders</u> to achieve the organizational objectives and goals. Proper Delegation of authority is considered as very important to <u>achieve efficiency in operations.</u></i></p>	3
	b	<p><b>Discuss the three types of managerial control.</b></p> <p><i>Managerial control can focus on issues before, during or after a process. Accordingly, management uses three types of controls viz., <u>Feedback control, Feed forward control and Concurrent control</u>, as described below:</i></p> <p><i>Then explain in detail the three types of control with a diagram if required.</i></p>	7
	c	<p><b>Explain the various key managerial roles in an organization</b></p> <p><i>A Manager plays three types of roles in an organization viz., Decisional Roles,</i></p>	10

		<p><i>Informational Roles and Inter-personal roles.</i></p> <p><i>Decisional Roles are role associated with methods managers use in planning strategy and utilizing resources. Informational Roles: Roles associated with the tasks needed to obtain and transmit information in the process of managing the organization. Inter-Personal Roles: Roles that managers assume to provide direction and supervision to both employees and the organization as a whole. Then, briefly elaborate on all the above three roles.</i></p>	
4	a	<p><b>What is meant by Total Quality Management</b></p> <p><i>Total Quality Management (TQM) is a systematic approach followed by the entire organisation to efficiently achieve the company's objectives to provide services and products with a high level of quality that satisfies the customer. It is a continual process of detecting and reducing or eliminating errors in manufacturing. Total quality management aims to hold all parties involved in the production process accountable for the overall quality of the final product or service.</i></p>	3
	b	<p><b>Write any 5 differences between Management and Administration</b></p> <p><i>Management involves conceiving, initiating and bringing together the various elements; coordinating, actuating, integrating the diverse organizational components while sustaining the viability of the organization towards some pre-determined goals. In other words, it is an art of getting things done through &amp; with the people in formally organized groups.</i></p> <p><i>Administration means guidance, leadership &amp; control of the efforts of the groups towards some common goals. Administration generally refers to a higher level managerial function.</i></p> <p><i>Then summarise in a tabular form the main differences between Management and Administration in terms of Meaning, Nature, Process, Function and level.</i></p>	7
	c	<p><b>What are the different types of organization structure? Explain any 2 with a flow chart.</b></p> <p><i>Organizations, are classified into two main types: <u>formal organizations and informal organizations (include a figure)</u> . These two types of firms have distinct features and often serve different purposes within the structure.</i></p> <p><i>Formal organisation structure is created by the management with the objective of attaining the organisational goals.</i></p> <p><i>There are several types of formal organisation based on their structure viz., Line Organisation, Line and Staff Organisation, Functional Organisation, Project Organisation, Matrix Organisation</i></p>	10

	<p><i>An informal organization, on the other hand, is a network of private and social relations that spontaneously form within a formal firm. These affinities are typically not defined or denied by the formal organization's systems or methods</i></p> <p><i>Then explain any two organization structures with flow chart.</i></p>	
5.	<p><b>Case Study</b></p>	
	<p>Mr. Subhash is a supervisor in an engineering company in Hyderabad. Morale in his office was quite low. The working hours was 9 am to 5 pm. Directive came from top management to allow flexi time for employees. Under the flexi time, all employees were to work 8 hours a day and the core working hours were fixed as 9 am to 2 pm and they could work the rest of 8 hours a day any time between 2 pm and 8 pm. Subhash believed his workers were honest and well motivated; so he did not bother to set up any system of control.</p> <p>After about 2 years, it was found that the average working hours were only 6 hours a day. The attendance during core period was only 70% of the total staff. Some people were found to be working only during the core period. With this state of affairs, top management was upset and decided to return to the earlier practice of regular working hours of 9 am to 5 pm. Subhash had believed and trusted his employees, but they had let him down.</p> <p><b>Questions:</b></p> <p>1. Why the employees misused the flexi hours introduced in the work place?</p> <p><i>High light that it is <u>natural</u> for the employees to use the flexi hours to their full advantage. Any such type of system change should have been <u>monitored closely for adherence</u> by the management in terms of attendance during core working hours and average working hours observed per day. Since there was no monitoring for the first 2 years, employees misused the flexi hours.</i></p> <p>2. Where did Mr Subhash went wrong in introducing the flexi hours?</p> <p><i>Bring out that Mr Subbaiah went wrong in <u>not properly assessing the behavior</u> of the people at work. He should have expected this problem when the flexi hours were introduced. As a manager, he should have monitored the attendance and working hours closely and take corrective action on the erred employees. <u>Trust and belief in people is no substitute for monitoring.</u></i></p>	<p>3</p> <p>3</p>

		<p>3. What is your assessment on the relationship between the supervisor and the workers and suggestions to improve?</p> <p><i>Bring out that the relationship between the supervisor and the workers appears to be normal. The workers are <u>not self-motivated</u>. It is worth while to consider introductions of (a) Incentives for meeting the output standards; (b) Plan / Organise some social events during break hour once in a while to smoothen the relationship and (c) Organise useful training programmes on Life skills to improve commitment and loyalty amongst the workers.</i></p>	4
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# CITY ENGINEERING COLLEGE

## Internal test II - MBA 1<sup>st</sup> Semester

Course Name: POB  
Course Code : 22MBA11  
Course year : 2023-24

Date: 25<sup>th</sup> April 2024  
Duration: 90 minutes  
Max Marks: 50

### **PRINCIPLES OF MANAGEMENT AND ORGANISATIONAL BEHAVIOR**

#### Course Outcomes and Blooms Level

SI No	Description of Course Outcome	Blooms Level
CO1	Gain practical experience in the field of Management and Organisational Behaviour	L1
CO2	Acquire conceptual knowledge of management, various functions of Management and theories in OB	L3
CO3	Comprehend and apply management and behavioral models to relate attitude, perception and personality	L2
CO4	Analyse the recent trends in Management and OB models	L4

Answer any TWO questions from Qn Nos. 1 to 4. Qn No. 5 is compulsory

Qn No.	Question	Marks	Course Outcome	Blooms Level	
1	a	What is the difference between Stake holders and Share holders	3	CO2	L3
	b	Briefly explain the MARS model of individual behavior.	7	CO3	L2
	c	Write a note on Hawthorne Experiment? What is the conclusion of the Hawthorne experiment?	10	CO2	L3
2	a	What is Stereo type?	3	CO3	L2
	b	Explain the various Organizational Learning processes to improve the effectiveness.	7	CO2	L3
	c	Explain MBTI. How does MBTI help managers	10	CO1	L1
3	a	What is meant by halo effect?	3	CO3	L2
	b	Differentiate between Type A and Type B Personality	7	CO2	L3
	c	Critically examine Maslows need hierarchy theory of motivation.	10	CO1	L1



4	a	What do you mean by Perception	3	CO1	L1
	b	What is Personality? Explain in detail different determinants in shaping personality	7	CO2	L3
	c	Explain the types of stress in work place and its causes	10	CO3	L2
5.		<b>Case Study</b>			
		<p>Kiran, an experienced underwriter in a reputed Insurance company wrote the following remarks on his exit interview questionnaire.</p> <p>“This job is not right for me. I like to have more input on decisions that affect me and I can show what I can do. I do not get enough feedback to tell if I am doing a good job or not and the company keeps people in the dark about where it is headed. Basically, I feel like an interchangeable part most of the time”. In an answer to the question about whether the company could have done anything to retain him, Kiran replied simply “Probably not”.</p> <p>Corporations should be concerned about employees like Kiran in order to reduce turnover, protect training investment, increase productivity, improve quality and reap the benefits of innovative thinking and team work. Human resource professionals and Managers can contribute to corporate success by encouraging employees empowerment, security, identity and competence. How? By recognizing the essential components of keeping their best people and by understanding what enhances and diminishes these components. Kiran doubt that his company will ever change, but other organizations are taking steps to focus on and enhance employee retention.</p> <p><b>Questions:</b></p> <ol style="list-style-type: none"> <li>1. Identify the problem in the case. (3 marks)</li> <li>2. Explain the reasons for Kiran’s decision to leave the Job. (3 marks)</li> <li>3. What the company could have done to retain the employees like Kiran. (4 marks)</li> </ol>			
			3	CO1	L1
			3	CO1	L1
			4	CO1	L4

CITY ENGINEERING COLLEGE  
**Department of MBA**  
Internal test II - MBA 1<sup>st</sup> Semester

Course Name: POB  
 Course Code : 22MBA11  
 Course year : 2023-24

Date: 25th April 2024  
 Duration: 90 minutes  
 Max Marks: 50

**Principles of management and organisational behavior**

**SCHEME OF EVALUATION**

Answer any TWO questions from Qn Nos. 1 to 4. Qn No. 5 is compulsory

Qn No.	Question	Marks	Course Outcome	Blooms Level
1	<p>a</p> <p>What is the difference between Stake holders and Share holders.</p> <p><i>Stakeholders are interested in a company's overall performance, while shareholders have an added interest in the company's stock performance or return on investment.</i></p>	3	CO2	L3
	<p>b</p> <p>Briefly explain the MARS model of individual behavior. MARS Model seeks to explain individual behavior as a result of internal and external factors or influences acting together.</p> <p><i>The acronym MARS stands for <u>motivation, ability, role perceptions and situational factors</u>. All the above four factors are critical and influence the individual behavior and performance, if any one of them is low in a given situation the employee will perform poorly.</i></p> <p><i>All these four factors need to be explained briefly in the answer.</i></p>	7	CO3	L2
	<p>c</p> <p>Write a note on Hawthorne Experiment? What is the conclusion of the Hawthorne experiment?</p> <p><i>The Hawthorne studies were conducted in the following four phases.</i></p> <p><i>1. Experiments to determine the effects of changes in illumination on</i></p>	10	CO4	L4

		<p>productivity, illumination experiments, 1924-27.</p> <p>2. Experiments to determine the effects of changes in hours and other working conditions on productivity, relay assembly test room experiments, 1927-28;</p> <p>3. Conducting plant-wide interviews to determine worker attitudes and sentiments, mass interviewing programme, 1928-30; and</p> <p>4. Determination and analysis of social organisation at work, bank wiring observation room experiments, 1931-32.</p> <p>These four phases need to be explained briefly and conclusion of the experiment to be mentioned.</p>			
2	a	<p>What is Stereo type?</p> <p><i>When we judge someone on the basis of our perception of the group to which he or she belongs, we are using a shortcut called stereotyping. For example, a boss might assume that a worker from a Middle East country is lazy and cannot meet performance objectives, even if the worker tried his best.</i></p>	3	CO2	L3
	b	<p>Explain the various Organizational Learning processes to improve the effectiveness.</p> <p><i>Mention and explain the three types of organizational learning viz., Double-loop learning, Single-loop learning and Deutero learning and deliberate on various forms of organizational learning such as Individual learning, Continuous Learning, Learning through empowerment, Embedded Systems Learning, Learning from the leadership Dialogue and Inquiry Learning: Team Learning:</i></p>	7	CO2	L3
	c	<p>Explain MBTI. How does MBTI help managers</p> <p><i>The Myers-Briggs Personality Type Indicator is a self-report inventory designed to identify a person's personality type, strengths, and preferences. The questionnaire was developed by Isabel Myers and her mother Katherine Briggs based on their work with Carl Jung's theory of personality types. Today, the MBTI inventory is one of the world's most widely used psychological instruments.</i></p> <p><i>Explain the frame work of MBTI and 16 personality types.</i></p>	10	CO4	L4

3	a	<p>What is meant by halo effect?</p> <p><i>A halo effect operates when we draw a general impression about an individual based on a single characteristic, such as intelligence, sociability, or appearance. In other words, this is the tendency to rate a man uniformly high or low in other traits if he is extraordinarily high or low in one particular trait: If a worker has few absences, his supervisor might give him a high rating in all other areas of work.</i></p>	3	CO2	L3
	b	<p>Differentiate between Type A and Type B Personality</p> <p><i>There are generally two types people of in organisations referred to as Type A and Type B. Type A individuals operate under stress, time pressure and deadlines. They emphasize quantity over quality. Type A individuals work long hours, make poor decisions, and are less creative. Their behavior is easier to predict. Type B individuals are more successful in organizations and generally become boss in organizations.</i></p> <p><i>Briefly explain the characteristics of Type A and Type B people and the relevance of understanding this for a manager.</i></p>	7	CO1	L1
	c	<p>Critically examine Maslows need hierarchy theory of motivation.</p> <p><i>Abraham Maslow, while carrying out research on Motivation in employees proposed that needs motivate the people, there are five types of needs viz., Physiological Needs, Safety, Love/Belongingness, Esteem and Self Actualisation. He also said that needs follow a hierarchy and satisfied need is no longer a motivator.</i></p> <p><i>Explain all the five types of needs and the criticisms of the theory.</i></p>	10	CO1	L1
4	a	<p>What do you mean by Perception</p> <p><i>It refers to the way in which something is regarded, understood, or interpreted. Its a belief or opinion, often held by many people and based on how things seem. The ability to see, hear, or become aware of something through the senses.</i></p>	3	CO2	L3
	b	<p>What is Personality? Explain in detail different determinants in shaping personality.</p> <p><i>Personality is the sum total of various factors which influences and shape an individual's unique pattern of</i></p>	7	CO2	L3

		<p>thoughts, emotions, and behaviors. These determinants help explain why individuals differ in their personalities and why they respond differently to various situations.</p> <p>The key determinants of personality include (a) Biological Factors including Hereditary, (b) Cultural factors, (c) Family and Social factors, and (d) Situational factors.</p> <p>Briefly explain each one of the above four factors which determines the personality.</p>			
	c	<p>Explain the types of stress in work place and its cause.</p> <p>Stress is a physiological and psychological response to a perceived threat or demand, often referred to as a stressor. It is the body's way of preparing to confront or avoid a challenging situation.</p> <p><i>Explain briefly the different types and causes of stress like Workload and Job Demands: Role Ambiguity and Role Conflict: Lack of Job Security: Inadequate Resources: Poor Work Relationships: Organizational Culture and Climate: Career Development and Advancement: Work-Life Balance: Physical Work Environment: Organizational Change: Job Insecurity and Economic Factors: Personal Factors:</i></p>	10	CO1	L1
5.		<b>Case Study</b>			
		<p>Kiran, an experienced underwriter in a reputed Insurance company wrote the following remarks on his exit interview questionnaire. "This job is not right for me. I like to have more input on decisions that affect me and I can show what I can do. I do not get enough feedback to tell if I am doing a good job or not and the company keeps people in the dark about where it is headed. Basically, I feel like an interchangeable part most of the time". In an answer to the question about whether the company could have done anything to retain him, Kiran replied simply "Probably not". Corporations should be concerned about employees like Kiran in order to reduce turnover, protect training investment, increase productivity, improve quality and reap the benefits of innovative thinking and team work. Human resource professionals and Managers can contribute to corporate success by encouraging employees empowerment,</p>			

	<p>security, identity and competence. How? By recognizing the essential components of keeping their best people and by understanding what enhances and diminishes these components. Kiran doubt that his company will ever change, but other organizations are taking steps to focus on and enhance employee retention.</p> <p>Questions:</p> <p>1. Identify the problem in the case. (3 marks)  <i>Elaborate on the problems of lack of feedback, lack of recognition, reward system and probably accountability pointed out by Mr Kiran.</i></p> <p>2. Explain the reasons for Kiran's decision to leave the Job. (3 marks)  <i>Explain the reasons such as lack of identity, motivation, lack of focus on results and other factors responsible for Kirans decision to quit.</i></p> <p>3. What the company could have done to retain the employees like Kiran. (4 marks)  <i>Briefly explain the need to keep the focus on people, their performance, feedback system and periodical reviews to address the issue of retaining the employees.</i></p>	3	CO3	L2
		3	CO3	L2
		4	CO3	L2

**CITY ENGINEERING COLLEGE**  
**Department of MBA**  
**Internal test III - MBA 1<sup>st</sup> Semester**

Course Name: POB  
 Course Code : 22MBA11  
 Course year : 2023-24

Date: 23<sup>rd</sup> May 2024  
 Duration: 90 minutes  
 Max Marks: 50

**PRINCIPLES OF MANAGEMENT AND ORGANISATIONAL BEHAVIOR**

**Course Outcomes and Blooms Level**

SI No	Description of Course Outcome	Blooms Level
CO1	Gain practical experience in the field of Management and Organisational Behaviour	L1
CO2	Acquire conceptual knowledge of management, various functions of Management and theories in OB	L3
CO3	Comprehend and apply management and behavioral models to relate attitude, perception and personality	L2
CO4	Analyse the recent trends in Management and OB models	L4

**Answer any TWO questions from Qn Nos. 1 to 4. Qn No. 5 is compulsory**

Qn No.	Question	Marks	Course Outcome	Blooms Level
1	a	3	CO2	L3
	b	7	CO3	L2
	c	10	CO4	L4
2	a	3	CO2	L3
	b	7	CO2	L3
	c	10	CO4	L4
3	a	3	CO2	L3
	b	7	CO1	L1
	c	10	CO1	L1

4	a	What are cross functional teams?	3	CO2	L3
	b	Explain the sources of power for individuals in organisations	7	CO2	L3
	c	Explain the Action research approach to organizational change.	10	CO1	L1
5.		<b>Case Study</b>			
		<p>Super Engineering Company has manufacturing facilities at Hyderabad, Pondicherry and Indore. The company adopted budgetary system with main emphasis on production and expenses budgets. The budget targets used to be set on the basis of analysis of production facilities and production operations. While two units located at Hyderabad and Pondicherry were working properly and were able to meet their budget targets, Indore unit was not able to do so. Mr. Manohar was transferred to Indore unit as plant manager. He joined the company about eight years back as engineer trainee and became the assistant plant manager at Hyderabad unit, the biggest of the three units. Manohar was very ambitious and a little bit autocratic. He believed in the exercise of authority and control to carry out his instructions. He was high achiever and believed in getting things done. He got quick promotions in the company. Immediately after joining at Indore unit as plant manager, Manohar made preliminary study of the plant and issued instructions to all departments to reduce their expenses by five per cent. A fortnight later, he instructed the departments to increase production by ten per cent. He also instructed all supervisors to strictly adhere to budgets. He introduced several new reports and watched the operations very closely. He suspended two supervisors the second month for not meeting the budget targets. Subsequently two supervisors left the plant. With all his efforts, the unit was very much on the right track and within six months exceeded the new budgeted figures by eight per cent. On setting the plant right, he was called back at Hyderabad, the productivity at Indore unit fell below the earlier level and the budget was again in trouble.</p> <p>Questions</p> <p>(a) Analyze the type of organizational climate created by Manohar at Indore unit? (5 Marks)</p> <p>(b) Why was there a drop in productivity at the unit after Manohar left it? (5 Marks)</p>			
			5	CO3	L2
			5	CO3	L2

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**CITY ENGINEERING COLLEGE**  
**Department of MBA**  
**Internal test III - MBA 1<sup>st</sup> Semester**

Course Name: POB  
 Course Code : 22MBA11  
 Course year : 2023-24

Date: 23<sup>rd</sup> May 2024  
 Duration: 90 minutes  
 Max Marks: 50

**Principles of Management and Organisational Behavior**

**SCHEME OF EVALUATION**

Answer any TWO questions from Qn Nos. 1 to 4. Qn No. 5 is compulsory

Qn No.		Question	Marks	Course Outcome	Blooms Level
1	a	<p>What do you understand by Whistle blowers in organizations.</p> <p><i>Whistle blowing is the activity of a person, often an employee, revealing information about activity within a private or public organization that is deemed wrong-doing, illegal, immoral, illicit, unsafe or fraudulent. The wrongdoing you disclose must be in the public interest.</i></p>	3	CO2	L3
	b	<p>Discuss the various ethical issues in Organisation Behavior and their importance.</p> <p><i>The most commonly experienced ethical issues include discrimination, harassment, unethical accounting, technological abuse, data privacy, health and safety, and favoritism and nepotism. Most of these concerns are experienced in workplaces.</i></p> <p><i>Explain each one of the above ethical issues briefly and their importance in managing the organizations.</i></p>	7	CO3	L2
	c	<p>What is meant by Team effectiveness? Explain any two models of team effectiveness.</p> <p><i>Team effectiveness is the capacity of a group of people, usually with complementary skills, to work together to accomplish goals set out by an authority, team members, or</i></p>	10	CO4	L4

		<p><i>team leaders. Highly effective teams are able to motivate each other and collaborate to solve problems, which leads to greater results. Research shows that employees are more likely to go the extra mile if they have the respect of their peers.</i></p> <p><i>Team effectiveness models help us understand the best management techniques to get optimal performance from the teams. There are six Team effectiveness models as below:</i></p> <ol style="list-style-type: none"> <li><i>1. Rubin, Plovnick, and Fry's GRPI Model of Team Effectiveness</i></li> <li><i>2. The Katzenbach and Smith Model</i></li> <li><i>3. The T7 Model of Team Effectiveness</i></li> <li><i>4. The LaFasto and Larson Model</i></li> <li><i>5. The Hackman Model of Team Effectiveness</i></li> <li><i>6. The Lencioni Model</i></li> </ol> <p><i>Understanding these team effectiveness models will help to figure out which of the team models would optimize team by shedding a light on what works and what needs to be improved.</i></p> <p><i>Then, explain any two of the above team effectiveness models.</i></p>			
2	a	<p><b>Distinguish between Power and Authority.</b></p> <p><i>Power refers to the capacity to influence others. The person who possesses power has the ability to manipulate or change the behavior of others. Authority, on the other hand, is the source of power. Authority is legitimate and it confers legitimacy to power. Power itself need not be legitimate.</i></p>	3	CO2	L3
	b	<p><b>Write a brief note on nature and characteristics of Teams.</b></p> <p><i>Teams are essential components of modern organizations, working together to achieve common goals and drive organizational success. Understanding the nature and types of teams is crucial for effective team building and optimizing their contributions.</i></p> <p><i>The Nature and Characteristics of Teams are Collaboration, Interdependence: Shared Responsibility: Mutual Support: Clear Roles and Goals:</i></p>	7	CO2	L3

		<i>Explain briefly each one of the above five nature and characteristics of teams.</i>			
	c	<p>Discuss the various elements of Organisation Culture.</p> <p><i>Organisation culture can be said to comprise of three different components viz., values, norms and artifacts.</i></p> <p><i>Organisational values are the basic building blocks of the fundamental beliefs and principles a company is built on. Organizational norms are an informal unspoken set of rules or guidelines outlining acceptable behaviors that all employees are expected to adhere to. Organisational artifacts are materials, buildings, symbols, names, images, logos, catchwords that make sense to all the stakeholders of an organisation; they therefore have meanings and do not just exist.</i></p> <p><i>Briefly explain each of the three elements of organizational culture.</i></p>	10	CO4	L4
3	a	<p>Define Organisational culture</p> <p><i>Organisational culture is a system of values, shared beliefs, practices and attitudes that govern every employee's action. It is a company's personality and the collection of traits that define a company's foundational values. Every organisation has a unique culture and encompasses both written and unwritten rules developed over time.</i></p>	3	CO2	L3
	b	<p>Discuss the process of Organisational Change.</p> <p><i>It refers to the actions in which a company or organization alters a major component of its organization such as technology or infrastructure or internal processes such as procurement procedure.</i></p> <p><i>Kurt Lewin developed a change model involving three steps: unfreezing, changing and refreezing. For Lewin, the process of change entails creating the perception that a change is needed, then moving toward the new, desired level of behavior and, finally, solidifying that new behavior as the norm. These three steps are known as Unfreezing, Change and Refreezing. First you must melt the ice to make it amenable to change (unfreeze). Then you must mold the iced water into the shape you want (change). Finally, you must solidify the new shape (refreeze).</i></p> <p><i>Then explain each of the three steps of organizational change.</i></p>	7	CO1	L1

	c	<p>Deliberate on the various stages of Team development.</p> <p><i>The process of team development involves four important stages namely Forming, Storming, Norming and Performing.</i></p> <p><i>Then explain briefly each of the four stages above.</i></p>	10	CO1	L1
4	a	<p>What are cross functional teams?</p> <p><i>Cross-functional teams consist of individuals who come from a variety of different departments and have a range of skills and expertise. These types of teams typically serve as a task force to solve problems or make decisions that require different types of input or experience.</i></p>	3	CO2	L3
	b	<p>Explain the sources of power for individuals in organizations</p> <p><i>Power refers to the capacity to influence others. The person who possesses power has the ability to manipulate or change the behaviour of others.</i></p> <p><i>John R. P. French and Bertram Raven identified five bases or sources of power: legitimate, reward, coercive, expert and referent power.</i></p> <p><i>Then explain each of the five sources of power.</i></p>	7	CO2	L3
	c	<p>Explain the Action research approach to organizational change.</p> <p><i>Action research is a research method that aims to simultaneously investigate and solve an issue. In other words, as its name suggests, action research conducts research and takes action at the same time.</i></p> <p><i>The action research methodology has five interwoven steps: diagnosis, analysis, feedback, action, and evaluation. Each of the five steps in the process build and complement one another and serve as a roadmap for the change agent.</i></p> <p><i>Explain the concept with a diagram.</i></p> <p><i>Explain each of the five steps of Action Research and also its advantages.</i></p>	10	CO1	L1

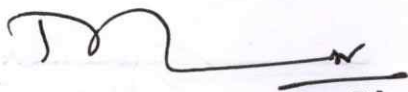
5.	<b>Case Study</b>			
	<p>Super Engineering Company has manufacturing facilities at Hyderabad, Pondicherry and Indore. The company adopted budgetary system with main emphasis on production and expenses budgets. The budget targets used to be set on the basis of analysis of production facilities and production operations. While two units located at Hyderabad and Pondicherry were working properly and were able to meet their budget targets, Indore unit was not able to do so. Mr. Manohar was transferred to Indore unit as plant manager. He joined the company about eight years back as engineer trainee and became the assistant plant manager at Hyderabad unit, the biggest of the three units. Manohar was very ambitious and a little bit autocratic. He believed in the exercise of authority and control to carry out his instructions. He was high achiever and believed in getting things done. He got quick promotions in the company. Immediately after joining at Indore unit as plant manager, Manohar made preliminary study of the plant and issued instructions to all departments to reduce their expenses by five per cent. A fortnight later, he instructed the departments to increase production by ten per cent. He also instructed all supervisors to strictly adhere to budgets. He introduced several new reports and watched the operations very closely. He suspended two supervisors the second month for not meeting the budget targets. Subsequently two supervisors left the plant. With all his efforts, the unit was very much on the right track and within six months exceeded the new budgeted figures by eight per cent. On setting the plant right, he was called back at Hyderabad, the productivity at Indore unit fell below the earlier level and the budget was again in trouble.</p>			
	<b>Questions</b>			
	<p>(a) Analyze the type of organizational climate created by Manohar at Indore unit? (5 Marks)</p>	5	CO3	L2
	<p><i>State what is organisational climate, apply to the case given and describe the organizational climate created by Mr. Manohar.</i></p>			
	<p>(b) Why was there a drop in productivity at the unit after Manohar left it? (5 Marks)</p>	5	CO3	L2
	<p><i>State what factors contribute to productivity including importance of social factors, analyse it to the case given and point out possible reasons for drop in productivity.</i></p>			

## LESSON PLAN

Week	Date		Topics Planned
	From	To	
I	12.2.24	15.2.24	Meaning and objectives, Differences between Administration and Management
II	19.2.24	22.2.24	Levels of Management, kinds of Managers, Managerial Roles
III	26.2.24	31.3.24	History of Management, Recent trends in Management.
IV	04.3.24	07.3.24	Planning, Importance and benefits, Types of plans, planning tools and techniques.
V	11.3.24	15.3.24	Organising, Types of organisation structure, Directions in organisation structures.
VI	18.3.24	22.3.24	Leading, traits and behavior, contingency approaches to leadership, Controlling, types of control, steps in control process.
VII	26.3.24	29.3.24	INTERNAL TESTS - I
VIII	01.4.24	5.4.24	OB, introduction, Organisational effectiveness, organisational learning, Stake holders

# LESSON PLAN

Week	Date		Topics Planned
	From	To	
IX	8.4.24	12.4.24	Behavioral dynamics, MARS model, personality in organisation, values in the work place.
X	15.4.24	19.4.24	Perception, Model of perceptual process, Emotions in work place, Motivation, Maslow's hierarchy of needs.
XI	22.4.24	26.4.24	REVISION & INTERNAL TEST - II
XII	29.4.24	3.5.24	Teams, Model of Team effectiveness, stages of team development, <del>power</del> power.
XIII	6.5.24	9.5.24	Culture, Elements of organisation, culture, organisational change, approaches to orgnl culture.
XIV	13.5.24	17.5.24	Action Research approach, Appreciative Inquiry approach, ethical issues of OB.
XV	20.5.24	24.5.24	REVISION & INTERNAL TEST - III
XVI	27.5.24	31.5.24	Revision of topics and orientation for SEE.



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## RECORD OF CLASS WORK

Date	Period	Topics Covered
12.2.24	I	Meaning and Introduction
13.2.24	II	Objectives
14.2.24	III	Difference between Admn. & Mgt
15.2.24	IV	Meaning & diff. between Admn. & Mgt.
19.2.24	I	Levels of Management
20.2.24	II	Kinds of Managers & their roles
21.2.24	III	Managerial Roles
22.2.24	IV	Managerial Skills
26.2.24	I	Brief summary of evolution of Mgt thought
27.2.24	II	Taylor's Scientific Management
28.2.24	III	Fayol's 14 Principles of Management
29.2.24	IV	Recent trends in Management
04.3.24	I	Importance of planning, Types of plans
05.3.24	II	Planning tools and techniques
06.3.24	III	Process of planning
07.3.24	IV	Benefits of planning.
11.3.24	I	Organising, Types of Orgn. structure
12.3.24	II	Types of Organisation structure
13.3.24	III	Traditional Structures
14.3.24	IV	Traditional Structures
15.3.24	I	Directions in Orgn structure.
18.3.24	I	Leading, Traits and behavior
19.3.24	II	Contingency approaches to Leadership
20.3.24	III	Transformational Leadership.

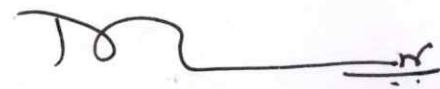
  
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# RECORD OF CLASS WORK

Date	Period	Topics Covered
21.3.24	<u>IV</u>	Controlling, steps in control process.
22.3.24	<u>II</u>	Types of control.
01.4.24	I	Organisational behavior, intro.
02.4.24	<u>II</u>	Organisational effectiveness
03.04.24	<u>III</u>	Organisational Learning, stake holders
04.04.24	<u>IV</u>	Contemporary challenges
08.04.24	I	Behavioral dynamics, MARS model
10.04.24	<u>III</u>	Types of individual behavior.
11.04.24	<u>IV</u>	Personality in organisation.
12.04.24	<u>II</u>	Values in work place
15.04.24	I	Perception, model of perception process.
16.04.24	<u>II</u>	Emotions at work place.
17.04.24	<u>III</u>	Circumplex model of Emotion.
18.04.24	<u>IV</u>	Attitude and Behavior.
19.04.24	I	Work related stress & its mgt.
22.04.24	I	Motivation
23.04.24	<u>II</u>	Maslows hierarchy of needs
24.04.24	<u>III</u>	Four drive theory
02.05.24	Visit	Industrial visit to I.S.R.O.
03.05.24	<del>Full</del> <u>III</u>	Teams, stages of team dev; power.
06.5.24	I	Organisational culture & its importance
07.5.24	<u>II</u>	Approaches to orgn culture.
08.5.24	<u>III</u>	Organisational change
09.5.24	<u>IV</u>	Resistance to change.

  
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 HOD'S Signature





# ವಿಶ್ವೇಶ್ವರಯ್ಯ ತಾಂತ್ರಿಕ ವಿಶ್ವವಿದ್ಯಾಲಯ



(“ವಿ ಟಿ ಯು ಅಧಿನಿಯಮ ೧೯೯೪” ರ ಅಡಿಯಲ್ಲಿ ಕರ್ನಾಟಕ ಸರ್ಕಾರದಿಂದ ಸ್ಥಾಪಿತವಾದ ರಾಜ್ಯ ವಿಶ್ವವಿದ್ಯಾಲಯ)

## VISVESVARAYA TECHNOLOGICAL UNIVERSITY

(State University of Government of Karnataka Established as per the VTU Act, 1994) "Jnana Sangama" Belagavi-590018, Karnataka, India)

Prof. B. E. Rangaswamy, Ph.D.  
REGISTRAR

Phone: (0831) 2498100  
Fax: (0831) 2405467

REF: VTU/BGM/BoS/Academic Calendar/2023-24 5838 DATE:

23 JAN 2024

### NOTIFICATION

**Subject:** Tentative Academic Calendar of 1st semester of MCA/M.Tech/MBA/M.Arch /M.Plan. programs, regarding...  
**Reference:** Hon'ble Vice-Chancellor's approval dated:

The tentative academic calendar concerned to 1<sup>st</sup> semester of MCA /M.Tech /MBA/ M. Arch /M. Plan programs, for the academic year 2023-24 are hereby notified as mentioned below;

	I semester MCA	I semester M.Tech	I semester MBA	I semester M.Arch	I semester M.Plan
Commencement of the Semester	12.02.2024	12.02.2024	12.02.2024	12.02.2024	12.02.2024
Commencement of Classes	12.02.2024	12.02.2024	12.02.2024	12.02.2024	12.02.2024
Last Working day of the Semester	25.05.2024	25.05.2024	25.05.2024	25.05.2024	25.05.2024
Practical Examination/ Internship Viva Voce/ Project viva	27.05.2024 To 31.05.2024	27.05.2024 To 31.05.2024		27.05.2024 To 31.05.2024	27.05.2024 To 31.05.2024
Theory Examinations	03.06.2024 To 20.06.2024	03.06.2024 To 20.06.2024	03.06.2024 To 20.06.2024	03.06.2024 To 20.06.2024	03.06.2024 To 20.06.2024
Internship	----	----	----	----	----
Commencement of NEXT Semester	25.06.2024	25.06.2024	25.06.2024	25.06.2024	25.06.2024

#### Please Note:

- The academic sessions for semesters should commence on the date mentioned above.
- If required, the college can plan to have extra classes' on 1<sup>st</sup> and 3<sup>rd</sup> Saturday and Sundays to complete academic activities within the academic duration mentioned.

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- The faculty/staff shall be available to undertake any work assigned by the university.
- Notification regarding the Calendar of Events relating to the conduct of University **Examinations** will be issued by the Registrar (Evaluation) from time to time.
- Academic Calendar **may be modified** based on guidelines/directions issued in the future by UGC/AICTE/State Government.
- Autonomous Colleges must adhere to the Academic Calendar as well. Any modifications to the academic terms and examination schedule that Autonomous Colleges choose to make can only be made with the University's concurrence.
- If any suggestions/ clarification please email to -[sbhalbhavi@vtu.ac.in](mailto:sbhalbhavi@vtu.ac.in)

The Principals of Non-Autonomous, Constituent, and Autonomous Engineering Colleges and chairpersons of the University departments are hereby informed to bring the academic calendar to the notice of all concerned.

Sd/-

REGISTRAR

To,

1. The Principals of all Non-autonomous/ constituent /Autonomous Engineering Colleges under the ambit of VTU Belagavi.
2. The chairperson, of the Department of Mechanical Engineering /Civil Engineering /Computer Science and Engineering& Communication Electronics Engineering of the University.

Copy to.

1. To the Hon'ble Vice-Chancellor through the secretary to VC, VTU Belagavi for information
2. The Registrar (Evaluation), VTU Belagavi for information and needful.
3. The Regional Directors (I/c) of all the regional offices of VTU for circulation.
4. The Director ITI SMU, VTU Belagavi for information and to make arrangements to upload the Academic Calendar on the VTU web portal.
5. The Director of Physical Education, VTU Belagavi for information
6. The Director, Central Placement Cell, VTU Belagavi for information
7. The Special Officer Library, VTU Belagavi for information
8. All the concerned Special Officer/s and Caseworker/s of the academic section, VTU, Belagavi
9. Office copy

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23/01/24  
REGISTRAR  
[Signature]



**CITY ENGINEERING COLLEGE, BENGALURU-560061. ACADEMIC CALENDAR 2023-24 (EVEN SEM) - Rev.1**

	FEB 2024		MARCH 2024		APRIL 2024		MAY 2024		JUNE 2024		JULY 2024		AUGUST 2024	
DAY	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT
MON					1	1 <sup>st</sup> to 25 <sup>th</sup> April 24 – Theory Examination – Vth Sem					1	1 <sup>st</sup> to 11 <sup>th</sup> July 24 Practical Exam II Sem B. E		
TUE					2	2 <sup>nd</sup> to 4 <sup>th</sup> March 24, I Test MCA					2			
WED					3		1	Holiday – May Day		VI Sem - Display of 1st IA Marks on NB and ERP Communication to parents	3	3 <sup>rd</sup> to 5 <sup>th</sup> July 24, II Test for VI Semester		
THU	1				4		2	Sports Day			4		1	IV Semester-Display of 2 <sup>nd</sup> IA Marks on NB and ERP Communication to parents
FRI	2		1		5		3	Sports Day			5		2	PTM – IVth Semester
SAT	3	1st Saturday Holiday	2	1st Saturday Holiday	6	1st Saturday Holiday	4	1st Saturday Holiday	1	1st Saturday Holiday	6	1st Saturday Holiday	3	1st Saturday Holiday
SUN	4		3		7		5		2		7		4	
MON	5		4		8		6		3	3 <sup>rd</sup> June to 20 <sup>th</sup> June 2024 Theory Examination of I Sem MBA/MCA/M. Tech	8		5	
TUE	6		5	5 <sup>th</sup> , 6 <sup>th</sup> , 7 <sup>th</sup> Mar 24, Test 2- III Sem, Test 3-V SEM (3C)	9	Holiday – Chandramana Ugadi	7	7 <sup>th</sup> May 24, 3 <sup>rd</sup> Test VIII Semester B. E	4		9		6	
WED	7		6	Commencement of Classes of II Sem B. E	10	Display of 1st Test IA Marks of MBA/MCA/M.Tech and 8 <sup>th</sup> Sem on NB and ERP Communication to parents	8	Ethnic Day	5		10		7	Last Working Day of the semester IV Semester
THU	8		7		11	Holiday – Qutub-e-Ramzan	9	College Day	6	6 <sup>th</sup> to 8 <sup>th</sup> JUNE 24 Test I – IV Sem B. E	11	VI Sem - Display of 2 <sup>nd</sup> IA Marks on NB and ERP Communication to parents	8	8 <sup>th</sup> to 17 <sup>th</sup> Aug 24, IVth Semester Practical Examination
FRI	9		8	Holiday -Maha Shiva Ratri	12		10	Holiday – Basava Jayanthi	7		12		9	
SAT	10		9	Last Working Day of classes III Sem B. E	13	Alumni Meet	11	Last Working Day of the Semester VIII Sem B. E And Farewell for VIII Semester Students	8		13		10	
SUN	11		10		14		12		9		14		11	
MON	12	Commencement of Classes of I Sem MBA/MCA/M.Tech and VIII Sem B. E	11		15		13	13 <sup>th</sup> to 21 <sup>st</sup> May 24 Theory Examinations – VIII Sem B.E	10		15	15 <sup>th</sup> July to 10 <sup>th</sup> Aug 24- Theory Exam- II Sem B. E	12	
TUE	13	Industrial Visit – 8 <sup>th</sup> Sem (CS/IS/AIIML), B.E	12		16	16 <sup>th</sup> to 18 <sup>th</sup> April 24, I-Test IInd Semester	14		11		16		13	
WED	14		13	13 <sup>th</sup> to 27 <sup>th</sup> Mar 24 Practical Examination -III Sem B. E	17		15		12		17	Holiday - Muharram	14	
THU	15		14		18		16		13		18		15	Holiday – Independence Day
FRI	16		15	Women's Day Celebrations and "Talents Day" for IInd Sem Students	19	MBA/MCA/M.Tech Industrial Visit	17		14	IV Semester - Display of I Test IA Marks on NB and ERP Communication to parents	19		16	
SAT	17	3rd Saturday Holiday	16	3rd Saturday Holiday Last Working Day of classes V Sem B. E	20	3rd Saturday Holiday	18	3rd Saturday Holiday	15	3rd Saturday Holiday	20	3rd Saturday Holiday	17	3rd Saturday Holiday
SUN	18		17		21		19		16		21		18	
MON	19	Industrial Visit – 5 <sup>th</sup> Sem (CS/IS/AIIML), B. E	18		22	Commencement of classes of IV Semester B. E	20		17	Holiday - Bakrid	22	22 <sup>nd</sup> to 24 <sup>th</sup> July 24 - Test II – IV Sem B. E	19	Commencement of Classes III Sem B. E and 19 <sup>th</sup> Aug to 12 <sup>th</sup> Sep 24 – IVth Semester Theory Examinations
TUE	20		19		23		21	21 <sup>st</sup> to 23 <sup>rd</sup> May 24 - III Test MBA/MCA/M.Tech	18	18 <sup>th</sup> to 20 <sup>th</sup> June 24, II-Test IInd Semester	23		20	
WED	21		20	20 <sup>th</sup> to 30 <sup>th</sup> Mar 24 Practical Examination – Vth Sem B. E	24	Display of 1st Test IA Marks of II Sem on NB and ERP Communication to parents	22		19		24		21	
THU	22		21		25	25 <sup>th</sup> to 27 <sup>th</sup> April 24, II Test MBA/MCA/M.Tech and 25 <sup>th</sup> April VIII Semester B. E	23	23 <sup>rd</sup> to 30 <sup>th</sup> May 24, Internship Viva-voce/Project Viva- VIII Semester	20		25		22	
FRI	23	23 <sup>rd</sup> Feb to 5 <sup>th</sup> Mar 2024 Practical Exam B.E I Sem B. E	22		26	"Battle of Science" for IInd Sem Students	24		21		26		23	International Conference
SAT	24		23		27		25	Last Working Day of I Sem MBA/MCA/M. Tech	22	Graduation Day	27		24	International Conference
SUN	25		24		28		26		23		28		25	
MON	26		25		29	Commencement of Classes of VI Semester B. E	27	27 <sup>th</sup> to 31 <sup>st</sup> May 24 Practical Examination/Internship Viva Voce/Project Viva of I Sem MCA/ M. Tech	24		29		26	
TUE	27		26	26 <sup>th</sup> to 28 <sup>th</sup> March 24, I Test MBA and 26 <sup>th</sup> March VIII Semester B. E	30		28	28 <sup>th</sup> to 30 <sup>th</sup> MAY 24, I Test for VI Semester	25	Commencement of Classes of II Sem MBA/MCA/M.Tech	30		27	
WED	28		27				29		26	Display of IInd IA Marks on NB and ERP Communication to parents	31		28	
THU	29		28	28 <sup>th</sup> Mar to 17 <sup>th</sup> April 24, Theory Examination – III Sem B. E			30		27				29	
FRI			29	Holiday – Good Friday			31		28	PTM – IInd Semester			30	
SAT			30						29	Last Working Day of The II Semester B. E			31	
SUN			31						30					

Note: 1. Students Feedback should be taken immediately after the Test. 2. No additional circular will be issued for the dates mentioned in Event 3. Department Activities/Events to be planned during Fridays and Saturdays



# CITY ENGINEERING COLLEGE

Approved by AICTE New Delhi & Affiliated by VTU, Belagavi  
Doddakallasandra, Off Kanakapura Main Road,  
Next to Gokulam Apartment, Bangalore - 560 062.




ACADEMIC YEAR:2023-24 (ODD)

## DEPARTMENT OF COMPUTER APPLICATIONS

### COURSE ALLOCATION

SL.NO	Name of the Faculty	Course code and Name	Year/ semester	signature
1.	Dr.Jyothi P	22MCA11- Mathematical foundation for computer application	1 <sup>st</sup> /I	
2.	Mr.Naseer Husen	22MCA12 - Operating System	1 <sup>st</sup> /I	
3.	Mrs. Bindu J	22MCA13 - Data structure with algorithms	1 <sup>st</sup> /I	
4.	Ms. Maheshwari M Desai	22MCA14 - Computer Networks	1 <sup>st</sup> /I	
5.	Ms. Pooja Taragar	22MCA15 - Design Analysis of Algorithms	1 <sup>st</sup> /I	
6.	Ms. Astha Tiwari	22RMI18 - Research Methodology & IPR	1 <sup>st</sup> /I	
7.	Mrs. Bindu J	22MCAL16 - Data structure with algorithms Laboratory	1 <sup>st</sup> /I	
8.	Ms. Maheshwari M Desai	22MCAL17 - Computer Networks Laboratory	1 <sup>st</sup> /I	
9.	Ms. Astha Tiwari	22MCA110 - Basic Programming & Computer Organization	1 <sup>st</sup> /I	

  
**HOD**  
Head of Department  
Master in Computer Applications  
CITY ENGINEERING COLLEGE  
Doddakallasandra,  
Off Kanakapura Main Road,  
Bangalore - 560 062.



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ACADEMIC YEAR:2023-24 (ODD)

## DEPARTMENT OF COMPUTER APPLICATIONS

### COURSE PREFERENCE

Name of the Faculty : Ms. Maheshwari M Desai

Designation : Assistant Professor

SI.NO	Course Code and Name	Year/Semester
1.	22MCA14 - Computer Networks	1 <sup>st</sup> / I
2.	22MCAL17 - Computer Networks Laboratory	1 <sup>st</sup> / I

  
Signature of Faculty



# CITY ENGINEERING COLLEGE

## Department Of MCA

ACADEMIC YEAR - EVEN SEMESTER [FEBRUARY 12 -02-2024]  
 COURSE : MCA SEM / SEC : 1A ROOM NO : 310

W.E.F. 12-02-2024

CLASS TEACHER : Mrs.Bindu J

Day/ Time	09:00 – 10:00 AM	10:00 – 11:00 AM		11:15 -12:15 PM	12:15-1:15 PM		2:00-3:00 PM	3:00- 4:00 PM	4:00-5:00 PM
Mon	MFCA	OS	Short break	DSA	CN	Lunch Break	CN Lab		
Tue	OS	MFCA		CN	ADA		DSA Lab		
Wed	CN	ADA		MFCA	DSA		IPCC		RM
Thu	DSA	CN		OS	ADA		RM	TUTORIAL	MENTORING
Fri	ADA	RM		LIBRARY	OS		DSA	BRIDGE COURSE	
Sat									

SL No	Course Code	Course Name	Course	Faculty Name
1	22MCA11	Mathematical foundation for computer Application	MFCA	Dr.Jyothi P
2	22MCA12	Operating System	OS	Mr.Naseerhusen A
3	22MCA13	Data Structure with Algorithms	DSA	Mrs.Bindu J
4	22MCA14	computer Networks	CN	Ms.Maheshwari D
5	22MCA15	Designs and Analysis of Algorithms	ADA	Ms. Pooja T
6	22MCA16	Data Structure with Algorithms Laboratory	DSA Lab	Mrs.Bindu J
7	22MCA17	Computer Networks Labrotory	CN Lab	Ms.Maheshwari D
8	22RMH18	Research Methodology and IPR	RM	Ms. Astha T
10	22MCA110	Basic of programming & computer organization	BPCO	Ms. Astha T

*[Signature]*  
 Head of Department  
 Master in Computer Applications  
 CITY ENGINEERING COLLEGE

*[Signature]*  
 PRINCIPAL

PRINCIPAL  
 CITY ENGINEERING COLLEGE  
 Nanakipura Main Road, BANGALORE - 560 061





# CITY ENGINEERING COLLEGE

## Department Of MCA

ACADEMIC YEAR - ODD SEMESTER [FEBRUARY 12 -02-2024]  
COURSE : MCA SEM / SEC : 1A ROOM NO : 310

Faculty Name : Ms.Maheshwari M Desai

W.E.F. 12-02-2024

SUBJECT: Computer Networks [22MCA14]

Day/ Time	9:00 – 10:00 AM	10:00 – 11:00 AM	11:00-11:15	11:15-12:15 PM	12:15-1:15 PM	1:15-2:00 PM	2:00-3:00 PM	3:00- 4:00 PM	4:00-5:00 PM
Mon			Short break		CN	Lunch Break	CN Lab		
Tue				CN					
Wed	CN								
Thu		CN							
Fri									
Sat									

**HOD**

Head of Department  
Master in Computer Applications  
CITY ENGINEERING COLLEGE  
Doddakallasandra  
Off Kanakapura Main Road  
Bangalore - 560066

<b>Computer Networks</b>			
Course Code	<b>22MCA14</b>	CIE Marks	50
Teaching Hours/Week (L:P:SDA)	3:0:0	SEE Marks	50
Total Hours of Pedagogy	40	Total Marks	100
Credits	03	Exam Hours	03
<b>Course Learning objectives:</b>			
<ul style="list-style-type: none"> <li>• Recognize computer networks.</li> <li>• List computer network topologies.</li> <li>• List required hardware to constitute computer network.</li> <li>• Explain each computer network topology physically or logically.</li> </ul>			
<b>Module-1</b>			
Introduction: Data Communications, Networks, The Internet, Protocols & Standards, Layered Tasks, The OSI model, Layers in OSI model, TCP/IP Protocol suite, Addressing			
<b>Teaching-Learning Process</b>	Chalk and talk method / PowerPoint Presentation		
<b>Module-2</b>			
Physical Layer-1: Analog & Digital Signals, Transmission Impairment, Data Rate limits, Performance, Digital-digital conversion (Only Line coding: Polar, Bipolar and Manchester coding), Analog-to-digital conversion (only PCM), Transmission Modes, Digital-to-analog conversion			
<b>Teaching-Learning Process</b>	Chalk and talk method / PowerPoint Presentation		
<b>Module-3</b>			
Physical Layer-2 and Switching: Multiplexing, Spread Spectrum, Introduction to switching, Circuit Switched Networks, Datagram Networks, Virtual Circuit Networks			
<b>Teaching-Learning Process</b>	Chalk and talk method / PowerPoint Presentation		
<b>Module-4</b>			
Data Link Layer-1: Error Detection & Correction: Introduction, Block coding, Linear block codes, Cyclic codes, Checksum.			
<b>Teaching-Learning Process</b>	Chalk and talk method / PowerPoint Presentation		
<b>Module-5</b>			
Data Link Layer-2: Framing, Flow and Error Control, Protocols, Noiseless Channels, Noisy channels, HDLC, PPP (Framing, Transition phases only)			
<b>Teaching-Learning Process</b>	Chalk and talk method / PowerPoint Presentation		

### Assessment Details (both CIE and SEE)

The weightage of Continuous Internal Evaluation (CIE) is 50% and for Semester End Exam (SEE) is 50%. The minimum passing mark for the CIE is 50% of the maximum marks. Minimum passing marks in SEE is 40% of the maximum marks of SEE. A student shall be deemed to have satisfied the academic requirements and earned the credits allotted to each subject/ course if the student secures not less than 50% (50 marks out of 100) in the sum total of the CIE (Continuous Internal Evaluation) and SEE (Semester End Examination) taken together.

#### Continuous Internal Evaluation:

1. Three Unit Tests each of **20 Marks**
2. Two assignments each of **20 Marks** or **one Skill Development Activity of 40 marks** to attain the COs and POs

The sum of three tests, two assignments/skill Development Activities, will be **scaled down to 50 marks**

**CIE methods /question paper is designed to attain the different levels of Bloom's taxonomy as per the outcome defined for the course.**

#### Semester End Examination:

1. The SEE question paper will be set for 100 marks and the marks scored will be proportionately reduced to 50.
2. The question paper will have ten full questions carrying equal marks.
3. Each full question is for 20 marks. There will be two full questions (with a maximum of four sub-questions) from each module.
4. Each full question will have a sub-question covering all the topics under a module.
5. The students will have to answer five full questions, selecting one full question from each module

#### Suggested Learning Resources:

##### Text Books:

1. Behrouz A. Forouzan,; Data Communication and Networking, 4<sup>th</sup> Edition Tata McGraw-Hill, 2006.

##### Reference books:

1. Alberto Leon-Garcia and Indra Widjaja: Communication Networks - Fundamental Concepts and Key architectures, 2nd Edition Tata McGraw-Hill, 2004.
2. William Stallings: Data and Computer Communication, 8th Edition, Pearson Education, 2007.
3. Larry L. Peterson and Bruce S. Davie: Computer Networks – A Systems Approach, 4th Edition, Elsevier, 2007.
4. Nader F. Mir: Computer and Communication Networks, Pearson Education, 2007.

#### Web links and Video Lectures (e-Resources):

- <https://www.binghamton.edu/watson/continuing-education/data-science/intro-to-computer-networks.html>
- <https://elearn.daffodilvarsity.edu.bd/course/view.php?id=5457>
- [https://onlinecourses.nptel.ac.in/noc21\\_cs18/preview](https://onlinecourses.nptel.ac.in/noc21_cs18/preview)

#### Skill Development Activities Suggested

- The students with the help of the course teacher can take up technical –activities which will enhance their skill or the students should interact with industry (small, medium and large), understand their problems or foresee what can be undertaken for study in the form of research/testing/projects, and for creative and innovative methods to solve the identified problem. The prepared report shall be evaluated for CIE marks.

**Course outcome (Course Skill Set)**

At the end of the course the student will be able to :

Sl. No.	Description	Blooms Level
CO1	Apply the basic concepts of networks like protocol, internet and OSI layers	L3
CO2	Analyze the working of Physical Layer.	L3
CO3	Demonstrate the various Switching networks	L3
CO4	Analyze the Data Link Layer	L3

**Program Outcome of this course**

Sl. No.	Description	POs
1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and computer science and business systems to the solution of complex engineering and societal problems.	PO1
2	Problem analysis: Identify, formulate, review research literature, and analyze complex engineering and business problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.	PO2
3	Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.	PO3
4	Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.	PO4
5	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations	PO5
6	The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering and business practices.	PO6
7	Environment and sustainability: Understand the impact of the professional engineering solutions in business societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.	PO7
8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering and business practices.	PO8
9	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.	PO9
10	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.	PO10
11	Project management and finance: Demonstrate knowledge and understanding of the engineering, business and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.	PO11
12	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.	PO12

Mapping of COS and POs												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	x				x							
CO2		x										
CO3	x				x							
CO4		x										

MCA 2022 Syllabus



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Doddakallasandra, Off Kanakapura Main Road,  
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## DEPARTMENT OF MCA Lesson-Plan

**Subject Code** : 22MCA14  
**Subject** : Computer Networks  
**Semester** : 1<sup>st</sup>  
**Academic Year** : 2023-2024  
**Faculty Name** : Maheshwari M Desai

**Prerequisite:** Understanding the fundamentals of computer networking requires a grasp of basic computer science concepts like data structures and algorithms, along with knowledge of communication protocols and network architectures. Additionally, familiarity with operating systems and their networking capabilities provides a solid foundation for delving into the intricacies of network design and management.

### **Objective :**

- Recognize computer networks.
- List computer network topologies.
- List required hardware to constitute computer network.
- Explain each computer network topology physically or logically.

### **Course Outcomes :**

**CO1** : Apply the basic concepts of networks like protocol, internet and OSI layers .  
**CO2** :Analyze the working of Physical Layer.  
**CO3** :Demonstrate the various Switching networks .  
**CO4** :Analyze the Data Link Layer .



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Module	Date	Planned Topic	Hr	Books Referred	Pedagogy
1	12/02/24	Introduction: Data communication, fundamental characteristics and components	4	T1 3-5	PPT/ Chalk and board
	13/02/24	Data Representation ,Data flow	3	T1 5-7	PPT/ Chalk and board
	14/02/24	Networks,Topologies ,the Internet	1	T1 7-19	PPT/ Chalk and board
	19/02/24	Protocols and Standards	4	T1 19-21	PPT/ Chalk and board
	20/02/24	Layered Task	3	T1 27-29	PPT/ Chalk and board
	21/02/24	Brief Explanation about OSI model	1	T1 29-33	PPT/ Chalk and board
	26/02/24	Layers in OSI model	4	T1 33-42	PPT/ Chalk and board
	27/02/24	TCP/IP Protocol Suite ( Physical and data link layer)	3	T1 42-45	PPT/ Chalk and board
	28/02/24	Addressing	1	T1 45-50	PPT/ Chalk and board
2	04/03/24	Physical Layer-1: Analog & Digital Signals,	4	T1 57-71	PPT/ Chalk and board
	05/03/24	Digital Signals	3	T1 71-80	PPT/ Chalk and board
	06/03/24	Transmission Impairment,	1	T1 80-85	PPT/ Chalk and board



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2	11/03/24	Data Rate limits	4	T1 85-88	PPT/ Chalk and board
	12/03/24	Performance	3	T1 89-94	PPT/ Chalk and board
	13/03/24	Digital digital conversion (polar)	1	T1 101-109	PPT/ Chalk and board
	18/03/24	Digital digital conversion((Biphase)	4	T1 109-110	PPT/ Chalk and board
	19/03/24	Digital digital conversion(Bipolar)	3	T1 110-111	PPT/ Chalk and board
	20/03/24	Analog-to-digital conversion(PCM)	1	T1 120-129	PPT/ Chalk and board
	25/03/24	Transmission Modes( Parallel)	4	T1 131-132	PPT/ Chalk and board
	26/03/24	Transmission Modes(serial)	3	T1 132-135	PPT/ Chalk and board
	27/03/24	Digital-to-analog conversion	1	T1 141-152	PPT/ Chalk and board

## IA TEST- I ( 2,3,4)

	01/04/24	Physical Layer-2 and Switching: Introduction	4	T1 161-169	PPT/ Chalk and board
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3	08/04/24	Multiplexing,	4	T1 169 -180	PPT/ Chalk and board
	10/04/24	Spread Spectrum,	1	T1 180-185	PPT/ Chalk and board
	15/04/24	Introduction to switching,	4	T1 213-214	PPT/ Chalk and board
	16/04/24	Circuit Switched Networks	3	T1 214-218	PPT/ Chalk and board
	17/04/24	Datagram Networks	1	T1 218-221	PPT/ Chalk and board
	18/04/24	Virtual Circuit Networks	2	T1 221-227	PPT/ Chalk and board

4	22/04/24	Data Link Layer-1: Error Detection & Correction: Introduction	4	T1 267-271	PPT/ Chalk and board
	23/04/24	Block coding	3	T1 271-277	PPT/ Chalk and board
	24/04/24	Linear block codes,	1	T1 277-284	PPT/ Chalk and board
	25/04/24	Cyclic codes,	2	T1 284-298	PPT/ Chalk and board
	07/05/24	Checksum.	3	T1 298-301	PPT/ Chalk and board

## IA TEST-II ( 29,30,3,6 )

	08/05/24	Data Link Layer-2: Framing	1	T1 307-310	PPT/ Chalk and board
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5	09/05/24	Flow and Error Control, Protocols	2	T1 311-312	PPT/ Chalk and board
	13/05/24	Noiseless Channels	4	T1 313 -314	PPT/ Chalk and board
	14/05/24	Noisy channels,	3	T1 315-340	PPT/ Chalk and board
	15/05/24	<b>HDLC</b>	1	T1 340 -346	PPT/ Chalk and board
	16/05/24	Point to point Protocol	2	T1 346- 349	PPT/ Chalk and board

## IA TEST-III (21,22,23,24)

25/05/24	Revision	
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## Assignment Topics

SL.NO	Topics	Dates
1	1 <sup>st</sup> Module questions and question paper solving	22/3/2024
2	Presentation	07/04/2024

## Text Books:

1. Behrouz A. Forouzan,; Data Communication and Networking, 4th Edition Tata McGraw-Hill, 2006.

## Reference books:-

1. Alberto Leon-Garcia and Indra Widjaja: Communication Networks - Fundamental Concepts and Key architectures, 2nd Edition Tata McGraw-Hill, 2004.
2. William Stallings: Data and Computer Communication. 8th Edition, Pearson Education, 2007.



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3. Larry L. Peterson and Bruce S. Davie: Computer Networks – A Systems Approach, 4th Edition, Elsevier, 2007.
4. Nader F. Mir: Computer and Communication Networks, Pearson Education, 2007.

**Faculty**

[Ms. Maheshwari M Desai]

**HOD**

[Dr. Puja Shashi]

**Head of Department**  
**Master In Computer Application**  
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## DEPARTMENT OF MCA

### Question Bank

**Subject Name** : Computer Networks

**Subject Code** : 22MCA14

**Semester** : 1st

**Academic Year** : 2023-2024

### Module 1

Sl.No	Questions	Marks
1	What is Data communication.	2
2	Briefly explain the five components of data communication system with an example.	5
3	What is Data Representation? Explain Types of Data in computer networks.	5
4	Define Data flow.Explain Types of transmission Mode.	5
5	Define Networks.	2
6	Explain Physical Structures	4
7	Explain Physical Topologies.	5
8	Discuss advantages of all Physical Topologies.	5
9	Discuss disadvantages of all Physical Topologies.	5
10	Explain layered task with neat diagram.	5
11	Briefly explain OSI model(Network architecture) with neat diagram.	10
12	Discuss the functionalities of physical , data link and network layers of OSI reference model with suitable diagram.	10
13	Discuss the functionalities of transport,session ,presentation and application layer of OSI reference model with suitable diagram.	10
14	Explain the TCP/IP protocol suite with a neat labeled diagram.	10
15	Explain the different types of addresses used in TCP/IP.	10



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## Module 2

Sl.No	Questions	Marks
1	Define Analog and Digital signals.	2
2	Define Analog and Digital data.	2
3	Explain Analog Signal.	5
4	Explain Digital signal.	5
5	What is Sin Wave? Explain Three Parameters of sin Wave .	5
6	Define Wavelength.	2
7	Define Time and frequency Domain	2
8	Define Composite Signals	2
9	Explain Bandwidth.	5
10	Explain Base Band Transmission	5
11	Explain Broadband Transmission	5
12	Define Transmission Impairment	2
13	Briefly Explain causes of Transmission Impairment with neat diagram.	10
14	Explain Noiseless Channel.	5
15	Explain Noisy Channel.	5
16	Define Digital-to-digital conversion	2
17	Explain Line coding with block diagram	5
18	What is Unipolar. Explain with example.	5
19	Define NRZ(polar). Explain with example.	5
20	Define RZ(polar). Explain with Example.	5
21	Define Bipolar. Explain with example.	5
22	What is Bipolar Schemes. Explain 2 variations of bipolar encoding.	5
23	Discuss the different phases of PCM in detail with a suitable example.	10
24	Define Transmission Modes. Mention Types of Data Transmission.	4
25	Briefly Explain Parallel Transmission.	5
26	. List three different techniques in serial transmission and explain them.	10
27	Discuss the Digital-to-Analog Conversion with neat diagram.	10



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## Module 3

SL.NO	Questions	Marks
1	Define multiplexing and Demultiplexing.	4
2	Explain the process of multiplexing and demultiplexing with neat labeled diagram.	10
3	Explain the categories of multiplexing with neat daigram.	10
4	Make out the differences between synchronus TDM and Statistical TDM with daigram.	10
5	What is spread Spectrum.Mention the types of it.	2
6	Briefly explain Frequency hopping spread spectrum.Illustrate with example.	5
7	Briefly explain Direct hopping spread spectrum .Illustrate with example.	5
8	Define switching and mention types if switching.	2
9	Briefly explain circuit switched network with block diagram.	10
10	Discuss the advantages and Disadvantages of circuit switched network .	5
11	Briefly explain datagram network with block diagram.	10
12	Discuss the advantages and Disadvantages of datagram network .	5
13	Define virtual circuit network.	2
14	Perform Request and acknowledgement setup in virtual circuit networks with diagram	10
15	Discuss the advantages and Disadvantages of virtual circuit networks	5

## Module 4

SL.NO	Questions	Marks
1	What do you mean by Errors ?Types of Error.	2
2	Recall the different types of errors occurred during data transmission in networks.	5
3	Explain the procedure employed for error detection and error correction in block coding.	5
4	Discuss the design of the encoder and decoder of Hamming code generation. Explain the two dimensional parity check value.	10
5	Calculate the CRC for the given bit stream 1101011011 with a given generater polynomial $G(x)=x^2+x+1$ .	10
6	Write the steps involved in Internet checksum algorithm on both sender and receiver side.	5
7	Evaluate checksum value of 1001001110010011 and 1001100001001101 considering 16 bit data segment.	10



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## Module - 5

SL.NO	Questions	Marks
1	Define framing.	2
2	Differentiate between fixed size and variable size.	2
3	Apply bit stuffing for the following data bit sequence 1 0 0 1 1 1 1 1 0 0 0 0 1 1 1 1 .	5
4	Define flow and error control .	5
5	Discuss the design of stop and wait protocol for noiseless channel.write an algorithm for sender and receiver side.	10
6	Discuss the design of simplest protocol for noiseless channel.write an algorithm for sender and receiver side.	5
7	Discuss the design of stop and wait automatic repeat request for noisy channel.write an algorithm for sender and receiver side.	10
8	Discuss the design of Go - Back -N automatic repeat request for noisy channel.write an algorithm for sender and receiver side.	10
9	Discuss the design of Selective repeat automatic repeat request for noisy channel.write an algorithm for sender and receiver side.	10
10	Explain the frame formats of HDLC and PPP protocol in detail.	10

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COURSE CODE:22MCA14

**CITY ENGINEERING COLLEGE BANGALORE**  
**FIRST INTERNAL TEST**

Program: MCA  
Course Name: Computer Networks  
Sem: I  
Duration: 90 Minutes.

Date:03/04/2024.  
Time:2:30 PM – 4:00PM  
Max Marks: 40

*Note: Answer all Questions selecting any ONE FULL questions from each part.*

Q No.	Questions	Marks	CO's	BL'S
<b>PART-A</b>				
1	a).Briefly explain the five components of data communication system with neat diagram.	05	CO1	L3
	b).Explain physical topologies with advantages and disadvantages.	05		
<i>Or</i>				
2	Discuss the functionalites of physical , Data link and Network ,transport layers of OSI reference model with suitable diagram.	10	CO1	L3
<b>PART-B</b>				
3	Briefly explain OSI model (Network architecture) with neat diagram.	10	CO1	L3
<i>Or</i>				
4	Explain the TCP/IP protocol suite with a neat-labeled diagram.	10	CO1	L3
<b>PART-C</b>				
5	Explain the characteristics of analog and digital signals.	10	CO1	L3
<i>Or</i>				
6	Briefly explain Baseband transmission.	10	CO1	L3
<b>PART-D</b>				
7	Discuss the causes for transmission impairment in computer networks.	10	CO1	L3
<i>Or</i>				
8	What does the amplitude of a signal measure? What does the frequency signal measure? What does the phase of a signal measure?	10	CO1	L3

**Blooms Levels (BL'S): L1-Remembering L2- Understanding L3 – Applying**

**Course outcome**

**CO1:** Apply the basic concepts of networks like,protocol,internet and OSI layers

----ALL THE BEST----





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**Department Of Master Of Computer Applications**

Outcome Based Education(OBE)and Choice Based Credit System(CBCS),VTU

**Semester-I(A)**

Continuous Internal Evaluation- II

Date: 30/04/2024 (AN)

Subject Code:	22MCA14	CIE Marks:	20
Subject Title:	Computer Networks	Exam Hrs.:	60 minutes

**Course Objectives:** This course will enable the students to

CLO 1: Recognize computer networks.

CLO 2: List computer network topologies.

CLO 3: List required hardware to constitute computer network.

CLO 4: Explain each computer network topology physically or logically.

**Note:** Answer **FIVE** full questions

Q.NO	Questions	Marks	CO-PO	Bloom's Taxonomy Level
Q.1	A. Discuss the different phase of PCM in detail with a suitable example.	4	CO2 – PO2	L2
	<b>OR</b> B. List three different techniques in serial transmission and explain them.	4	CO2 –PO2	L2
Q.2	A. Sketch the digital signal line coding for the given bit stream 01010000111101011 for biphase and bipolar encoding schemes. Analyse the characteristics of each output signal to select the best one.	4	CO2 – PO2	L3
	<b>OR</b> B. Discuss the Digital-to-Analog Conversion with neat diagram.	4	CO2- PO2	L2
Q.3	A. Explain the process of multiplexing and demultiplexing with a neat labeled diagram	4	CO3– PO1,PO5	L2
	<b>OR</b> B. Define virtual Circuit identifier. Perform request and acknowledgement setup in virtual circuits with neat sketch.	4	CO3– PO1,PO5	L3
Q.4	A. Make out the differences between Synchronous TDM and statistical TDM.	4	CO2 –PO2	L4
	<b>OR</b> B. Mention the advantages and disadvantages of circuit switched networks over Datagram Networks.	4	CO3 – PO1,PO5	L2

Q.5	A Explain Frequency Hopping Spread Spectrum. Illustrate with example	4	CO3 – PO1,PO5	L3
	<b>OR</b>			
	B.Explain the Categories of Multiplexing with neat daigram.	4	CO3 – PO1,PO5	L2

**Course Outcomes:** At the end of the course the student will be able to:

**CO2 :** Analyze the working of Physical Layer.

**CO3 :** Demonstrate the various Switching networks

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO2	-	2	-	-	-	-	-	-	-	-	-	-
CO3	2	-	-	-	2	-	-	-	-	-	-	-

a) Substantial (High)/3 b) Moderate (Medium)/2 c) Slight (Low)/1 d) No correlation/-

  
Faculty

Ms. Maheshwari M Desai

  
HOD 25/4/2014

Dr. Puja Shashi

Head of Department  
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Department Of Master of Computer Applications  
Outcome Based Education (OBE) and Choice Based Credit System (CBCS), VTU

Semester-I(A)

Continuous Internal Evaluation- III

Date: 04/06/2024 (AN)

Subject Code:	22MCA14	CIE Marks:	20
Subject Title:	Computer Networks	Exam Hrs.:	60 minutes

**Course Objectives:** This course will enable the students to

**CLO 1:** Recognize computer networks.

**CLO 2:** List computer network topologies.

**CLO 3:** List required hardware to constitute computer network.

**CLO 4:** Explain each computer network topology physically or logically.

**Note:** Answer FIVE full questions

Q.No	Questions	Marks	CO-PO	Bloom's Taxonomy Level
Q.1	A. What do you mean by Errors? Recall the different types of errors occurred during data transmission in networks.	4	CO4-PO2	L1
	<b>OR</b> B. Explain the procedure employed for error detection and error correction in block coding.	4	CO4-PO2	L2
Q.2	A. Calculate the CRC for the given bit stream 1101011011 with a given generator polynomial $G(x)=x^2+x+1$ .	4	CO4-PO2	L4
	<b>OR</b> B. Discuss the design of the encoder and decoder of Hamming code generation. Explain the two-dimensional parity check value.	4	CO4-PO2	L5
Q.3	A. Evaluate checksum value of 1001001110010011 and 1001100001001101 considering 16-bit data segment.	4	CO4-PO2	L5
	<b>OR</b> B. Define framing. Differentiate between fixed size and variable size.	4	CO4-PO2	L3
Q.4	A. Discuss the design of stop and wait protocol for noiseless channel. Write an algorithm for sender and receiver side.	4	CO4-PO2	L3
	<b>OR</b> B. Discuss the design of Go - Back -N automatic repeat request for noisy Channel. Write an algorithm for sender and receiver side.	4	CO4-PO2	L3

Q.5	A. Discuss the design of Selective repeat automatic repeat request for noisy Channel. Write an algorithm for sender and receiver side.	4	CO4-PO2	L3
	<b>OR</b>			
	B. Explain the frame formats of HDLC and PPP protocol in detail.	4	CO4-PO2	L3

**Course Outcomes:** At the end of the course the student will be able to:

**CO4 :** Analyze the Data Link Layer.

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO4	-	2	-	-	-	-	-	-	-	-	-	-

a) Substantial (High)/3 b) Moderate (Medium)/2 c) Slight(Low)/1 d) No correlation/-



Faculty

Ms. Maheshwari M Desai



HOD

Dr. Puja Shashi

Head of Department  
**Master in Computer Applcat**  
**CITY ENGINEERING COLLEGE**  
 Doddakallasandra  
 Off Kanakapura Main Road  
 Bangalore 560067

Year: 2023 - 2024

Semester: Odd / Even

Name of the Teacher : Asst. Prof. Maheshwari. M. Desai

Designation : Assistant Professor

Department : MCA

Sem/Branch







Subject Code

Subject

1. I 22MCA14 Computer network

2. ....

3. ....

	Initials at the End of the			
	1st Month	2nd Month	3rd Month	Semester
Staff	Desai	Desai	Desai	I
HOD				I
Principal				I



### RECORD OF CLASS WORK

Date	Period	Topics Covered
12/02/2024	4	Module 1 Introduction: data communication, fundamental characteristics, components
13/02/2024	3	data Representation, data flow
14/02/2024	1	Types of connection, Topologies, The internet
15/02/2024	2	Protocols and Standards
19/02/2024	4	Layered Tasks
20/02/2024	3	Brief Explanation about OSI Model
21/02/2024	1	Layers in OSI Model
22/02/2024	2	TCP/IP Protocol suite
26/02/2024	4	Internet layer & Interface layer
27/02/2024	3	Introduction to Addressing & Types
28/02/2024	1	Physical addresses, logical addresses
29/02/2024	2	Port addresses, specific addresses
04/03/2024	4	Module 2:- Introduction to Analogy & digital signals, characteristics
05/03/2024	3	Digital signals, composite signal
06/03/2024	1	Transmission of digital signal & Transmission impairment
07/03/2024	2	noise impairment & Data Rate limit
11/03/2024	4	Performance, Throughput
12/03/2024	3	Digital-to-Digital conversion, line coding

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Teacher's Signature

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HOD'S Signature

### RECORD OF CLASS WORK

Date	Period	Topics Covered
17/03/2024	1	Analogy to digital conversion (PCM) Sampling
14/03/2024	12	(PCM) quantizing & Encoding
18/03/2024	4	Transmission modes, Parallel transmission
19/03/2024	3	serial Transmission asynchronous synchronous, Isochronous
20/03/2024	1	digital-to-Analogy conversion Amplitude shift Keying (ASK)
21/03/2024	2	Frequency shift Keying (FSK) Phase shift Keying (PSK) quadrature
26/03/2024	3	Module 3:- Physical layer 2 & switching Introduction to multiplexing
27/03/2024	1	demultiplexing, Types - frequency division multiplexing
28/03/2024	2	wavelength division multiplexing & time division multiplexing
01/04/2024	2	Revision (Module 1 & Module 2)
08/04/2024	4	Spread spectrum and its Types
10/04/2024	2	Frequency hopping spread spectrum & direct sequence spread spectrum
15/04/2024	4	switched networks Introduction
15/04/2024	05	switched networks & its types
16/04/2024	3	circuit-switched networks

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Teacher's Signature

.....  
HOD'S Signature

### RECORD OF CLASS WORK

Date	Period	Topics Covered
17/04/2024	1	Setup phase, data transfer & teardown phase
18/04/2024	2	Advantages and disadvantages of circuit switched networks
24/04/2024	3	datagram networks
23/04/2024	2	virtual circuit networks
02/05/2024	2	Revision (Module 3)
07/05/2024	7	Module 4: Data link layer - 1
08/05/2024	1	Introduction, Types of Error
09/05/2024	2	Redundancy, coding, modular arithmetic
09/05/2024	2	Block coding, Error detection & Error correction
13/05/2024	4	Linear block codes simple parity check code (encoding & decoding)
14/05/2024	3	Two dimensional parity-check code (encoding & decoding)
15/05/2024	1	cyclic Redundancy check (CRC)
16/05/2024	2	checksum
16/05/2024	4	Module 5: Data link layer - 2
17/05/2024	7	Introduction to Framing & format of framing
18/05/2024	7	Flow & Error control, Introduction to protocol & its Types
22/05/2024	1	noiseless channel (simple & stop & wait)

Teacher's Signature

HOD'S Signature

### RECORD OF CLASS WORK

Date	Period	Topics Covered
23/05/2024	2	noisy channel (Stop-and-wait ARQ)
27/05/2024	4	noisy channel (Go-back-N ARQ)
28/05/2024	3	noisy channel (selective Repeat ARQ), Piggybacking
29/05/2024	1	HDL (High-level data link control)
30/05/2024	2	PPP (Point-to-point protocol)
06/06/2024	2	Revision (Module 4 & Module 5)
	1 <sup>st</sup> Period	09:30 am - 10:20 am
	2 <sup>nd</sup> Period	10:20 am - 11:10 am
	3 <sup>rd</sup> Period	11:30 am - 12:20 pm
	4 <sup>th</sup> Period	12:20 pm - 01:10 pm
	5 <sup>th</sup> Period	02:00 pm - 02:50 pm

Teacher's Signature

HOD'S Signature





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## DEPARTMENT OF MECHANICAL ENGINEERING

### CIRCULAR

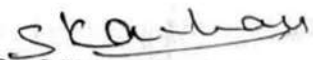
Ref No: CEC/ME/DAC/ACY 2023-2024/01

Date: 01-02-2024

This is to inform the members of Department Advisory Committee that meeting is scheduled on 10-02-2024 at 11: 00 AM in HMT Lab.

#### Agenda:

- Planning of Internships for 4<sup>th</sup> and 6<sup>th</sup> semester students
- Involving students in technical activities
- Conducting workshop/seminar/guest lectures

  
Dr. S.Karunakara

HOD



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## Department of Mechanical Engineering

### Department Advisory Committee Meeting

**Date: 10-02-2024**

**Time: 11:00 AM**

**Venue: HMT Lab**

DAC Members Present:

Sl. No	Member Name	Designation	Role
1	Dr.S.Karunakara	HOD	Convenor
2	Dr.Uma.T.R	Professor	Member
3	Dr.Mathenulla Shariff	Professor	Member
4	Mr.Harsha Vardhan U	Assistant Professor	Co-Convenor
5	Mrs.Shruti Naik	Assistant Professor	Member
6	Mr.Anil Kumar R	Assistant Professor	Member
7	Mr.Sampath HP	Assistant Professor	Member
8	Mr.Rakesh YD	Assistant Professor	Member
9	Mr.Vijay Kumar	Assistant Professor	Member

The Department Advisory Committee meeting was conducted at Department, on 10th October, 2024, at 11 AM.

#### Agenda of the Meeting:

- Planning of Internships for 4<sup>th</sup> and 6<sup>th</sup> semester students
- Involving students in technical activities
- Conducting workshop/seminar/guest lectures



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## Minutes of Meeting:

During the Department Advisory Committee meeting, an overview of the department was provided, showcasing student achievement, and faculty accomplishments and contributions. The members discussed suggestions for improvement and reviewed the meeting agenda.

The following points were discussed in the meeting:

- Committee members suggested establishing MOUs with various IT industries to provide students with internship opportunities.
- It was proposed to conduct a technical symposium with increased student participation.
- The committee decided to organize guest lecture, industry visit, and workshop for students in the 3rd, 5th, and 7th semesters.
- It was discussed to conduct an orientation for third-semester students to raise awareness about the 22-Scheme curriculum, particularly regarding registration for NSS, Yoga, or Physical Education.
- The HOD emphasized the importance of societal projects and the need to find opportunities for such initiatives.

  
Dr. S. Karunakara

HOD

**CITY ENGINEERING COLLEGE, BENGALURU-560061. ACADEMIC CALENDAR 2023-24 (EVEN SEM)**

DAY	FEB 2024		MARCH 2024		APRIL 2024		MAY 2024		JUNE 2024		JULY 2024		AUGUST 2024	
	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT
MON					1	1 <sup>st</sup> to 25 <sup>th</sup> April 24 – Theory Examination – Vth Sem					1	1 <sup>st</sup> to 11 <sup>th</sup> July 24 Practical Exam II Sem B. E		
TUE					2						2	2 <sup>nd</sup> to 4 <sup>th</sup> July 24 Test I – IV Sem B. E		
WED					3		1	Holiday – May Day		VI Sem - Display of 1st IA Marks on NB and ERP Communication to parents	3	3 <sup>rd</sup> to 5 <sup>th</sup> July 24, II Test for VI Semester		
THU	1				4		2	Sports Day			4		1	
FRI	2		1		5		3	Sports Day			5		2	
SAT	3	1 <sup>st</sup> Saturday Holiday	2	1 <sup>st</sup> Saturday Holiday	6	1 <sup>st</sup> Saturday Holiday	4	1 <sup>st</sup> Saturday Holiday	1	1 <sup>st</sup> Saturday Holiday	6	1 <sup>st</sup> Saturday Holiday	3	1 <sup>st</sup> Saturday Holiday
SUN	4		3		7		5		2		7		4	
MON	5		4		8		6		3	3 <sup>rd</sup> June to 20 <sup>th</sup> June 2024 Theory Examination of I Sem MBA/MCA/M. Tech	8		5	
TUE	6		5	5 <sup>th</sup> , 6 <sup>th</sup> , 7 <sup>th</sup> Mar 24, Test 2-III Sem, Test 3-V SEM (3C)	9	Holiday – Chandramana Ugadi	7	7 <sup>th</sup> May 24, 3 <sup>rd</sup> Test VII Semester B. E	4		9		6	
WED	7		6	Commencement of Classes of II Sem B. E	10		8	Ethnic Day	5		10	IV Semester- Display of 1st Test IA Marks on NB and ERP Communication to parents	7	
THU	8		7		11	Holiday – Qutub-e-Ramzan	9	College Day	6		11	VI Sem - Display of 2 <sup>nd</sup> IA Marks on NB and ERP Communication to parents	8	
FRI	9		8	Holiday -Maha Shiva Ratri	12		10	Holiday – Basava Jayanthi	7		12		9	
SAT	10		9	Last Working Day of classes III Sem B. E and Women's Day Celebrations	13	Alumni Meet	11	Last Working Day of the Semester VIII Sem B. E And Farewell for VIII Semester Students	8		13		10	
SUN	11		10		14		12		9		14		11	
MON	12	Commencement of Classes of I Sem MBA/MCA/M.Tech and VIII Sem B. E	11		15		13	13 <sup>th</sup> to 21 <sup>st</sup> May 24 Theory Examinations – VIII Sem B.E	10		15	15 <sup>th</sup> July to 10 <sup>th</sup> Aug 24-Theory Exam- II Sem B. E	12	
TUE	13	Industrial Visit – 8 <sup>th</sup> Sem (CS/IS/AIML), B.E	12		16	16 <sup>th</sup> to 18 <sup>th</sup> April 24, I-Test IInd Semester	14		11		16		13	
WED	14		13	13 <sup>th</sup> to 27 <sup>th</sup> Mar 24 Theory Examination -III Sem B. E	17		15		12		17	Holiday - Muharram	14	
THU	15		14		18		16		13		18		15	Holiday – Independence Day
FRI	16		15		19	MBA/MCA/M.Tech Industrial Visit	17		14		19		16	
SAT	17	3 <sup>rd</sup> Saturday Holiday	16	3 <sup>rd</sup> Saturday Holiday Last Working Day of classes V Sem B. E	20	3 <sup>rd</sup> Saturday Holiday	18	3 <sup>rd</sup> Saturday Holiday	15	3 <sup>rd</sup> Saturday Holiday	20	3 <sup>rd</sup> Saturday Holiday	17	3 <sup>rd</sup> Saturday Holiday
SUN	18		17		21		19		16		21		18	
MON	19	Industrial Visit – 5 <sup>th</sup> Sem (CS/IS/AIML), B. E	18		22		20	Commencement of classes of IV Semester	17	Holiday - Bakrid	22		19	Commencement of Classes III Sem B. E
TUE	20		19		23		21	III Test MBA/MCA/M.Tech	18	18 <sup>th</sup> to 20 <sup>th</sup> June 24, II-Test IInd Semester	23		20	20 <sup>th</sup> to 22 <sup>nd</sup> Aug 24 Test II – IV Sem B. E
WED	21		20	20 <sup>th</sup> to 30 <sup>th</sup> Mar 24 Practical Examination – Vth Sem B. E	24	Display of 1st Test IA Marks on NB and ERP Communication to parents	22		19		24		21	
THU	22		21		25	25 <sup>th</sup> to 27 <sup>th</sup> April 24, II Test MBA/MCA/M.Tech and 25 <sup>th</sup> April VIII Semester B. E	23	23 <sup>rd</sup> to 30 <sup>th</sup> May 24, Internship Viva-voce/Project Viva- VIII Semester	20		25		22	
FRI	23	23 <sup>rd</sup> Feb to 5 <sup>th</sup> Mar 2024 Practical Exam B.E I Sem B. E	22		26	"Battle of Science" for IInd Sem Students	24		21		26		23	
SAT	24		23	"Talents Day" for IInd Sem Students	27		25	Last Working Day of I Sem MBA/MCA/M. Tech	22	Graduation Day	27		24	
SUN	25		24		28		26		23		28		25	
MON	26		25	25 <sup>th</sup> to 27 <sup>th</sup> March 24, I Test MBA/MCA/M.Tech and 25 <sup>th</sup> March VIII Semester B. E	29	Commencement of Classes of VI Semester B. E	27	27 <sup>th</sup> to 31 <sup>st</sup> May 24 Practical Examination/Internship Viva Voce/Project Viva of I Sem MCA/ M. Tech	24		29		26	Display of 2 <sup>nd</sup> Test IA Marks on NB and ERP Communication to parents
TUE	27		26		30		28	28 <sup>th</sup> to 30 <sup>th</sup> MAY 24, I Test for VI Semester	25	Commencement of Classes of II Sem MBA/MCA/M.Tech	30	International Conference	27	
WED	28		27				29		26	Display of IInd IA Marks on NB and ERP Communication to parents	31	International Conference	28	
THU	29		28				30		27				29	
FRI			29	Holiday – Good Friday			31		28	PTM – IInd Semester			30	PTM – IVth Semester
SAT			30	29 <sup>th</sup> Mar to 12 <sup>th</sup> April 24, Practical Examination – III Sem B. E					29	Last Working Day of The II Semester B. E			31	Last Working Day of the semester IV Semester
SUN			31						30					

Note: 1. Students Feedback should be taken immediately after the Test. 2. No additional circular will be issued for the dates mentioned in Event 3. Department Activities/Events to be planned during Fridays and Saturdays

**CITY ENGINEERING COLLEGE, BENGALURU-560061. ACADEMIC CALENDAR 2023-24 (EVEN SEM) Dept. of ME**

DAY	FEB 2024		MARCH 2024		APRIL 2024		MAY 2024		JUNE 2024		JULY 2024		AUGUST 2024	
	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT
MON					1	1 <sup>st</sup> to 25 <sup>th</sup> April 24 – Theory Examination – Vth Sem					1			
TUE					2						2	2 <sup>nd</sup> to 4 <sup>th</sup> July 24 Test I – IV Sem B. E		
WED					3		1	Holiday – May Day		VI Sem - Display of 1st IA Marks on NB and ERP Communication to parents	3	3 <sup>rd</sup> to 5 <sup>th</sup> July 24, II Test for VI Semester		
THU	1				4		2	Sports Day			4			1
FRI	2		1		5		3	Sports Day			5			2
SAT	3	1st Saturday Holiday	2	1st Saturday Holiday	6	1st Saturday Holiday	4	1st Saturday Holiday	1	1st Saturday Holiday	6	1st Saturday Holiday	3	1st Saturday Holiday
SUN	4		3		7		5		2		7		4	
MON	5		4		8		6		3		8		5	
TUE	6		5	5 <sup>th</sup> , 6 <sup>th</sup> , 7 <sup>th</sup> Mar 24 Test 2- III Sem, Test 3-V SEM	9	Holiday – Chandramagna Ugadi	7	7 <sup>th</sup> May 24, 3 <sup>rd</sup> Test VIII Semester B. E	4		9		6	
WED	7		6	Commencement of Classes of II Sem B. E	10		8	Ethnic Day	5		10	IV Semester - Display of 1st Test IA Marks on NB and ERP Communication to parents	7	
THU	8		7		11	Holiday – Qutub-e-Ramzan	9	College Day	6		11	VI Sem - Display of 2 <sup>nd</sup> IA Marks on NB and ERP Communication to parents	8	
FRI	9		8	Holiday -Maha Shiva Ratri	12		10	Holiday – Pasava Jayanthi	7		12		9	
SAT	10		9	Last Working Day of classes III Sem B. E	13		11	Last Working Day of the Semester VIII Sem B. E And Farewell for VIII Semester Students	8		13		10	
SUN	11		10		14		12		9		14		11	
MON	12	Commencement of Classes of VIII Sem B. E	11		15		13	12 <sup>th</sup> to 21 <sup>st</sup> May 24 Theory Examinations – VIII Sem B.E	10		15	15 <sup>th</sup> July to 10 <sup>th</sup> Aug 24- Theory Exam- II Sem B. E	12	
TUE	13		12		16		14		11		16		13	
WED	14		13	13 <sup>th</sup> to 27 <sup>th</sup> Mar 24 Theory Examination -III Sem B. E	17		15		12		17	Holiday - Muharram	14	
THU	15		14		18		16		13		18		15	Holiday – Independence Day
FRI	16		15		19		17		14		19		16	
SAT	17	3rd Saturday Holiday	16	3rd Saturday Holiday Last Working Day of classes V Sem B. E	20	3rd Saturday Holiday	18	3rd Saturday Holiday	15	3rd Saturday Holiday	20	3rd Saturday Holiday	17	3rd Saturday Holiday
SUN	18		17		21		19		16		21		18	
MON	19		18		22		20	Commencement of classes of IV Semester B. E	17	Holiday - Bakrid	22		19	Commencement of Classes III Sem B. E
TUE	20		19		23		21		18		23		20	20 <sup>th</sup> to 22 <sup>nd</sup> Aug 24 Test II – IV Sem B. E
WED	21		20	20 <sup>th</sup> to 30 <sup>th</sup> Mar 24 Practical Examination – Vth Sem B. E	24	Display of 1st Test IA Marks on NB and ERP Communication to parents	22		19		24		21	
THU	22		21		25	II Test 25th April VIII Semester B. E	23	23 <sup>rd</sup> to 30 <sup>th</sup> May 24, Internship Viva-voce/Project Viva- VIII Semester	20		25		22	
FRI	23		22		26		24		21		26		23	
SAT	24		23		27	Technical Seminar(VIII sem)	25		22	Graduation Day	27		24	
SUN	25		24		28		26		23		28		25	
MON	26		25	I Test VIII Semester B. E	29	Commencement of Classes of VI Semester B. E	27	Industrial Visit(IV/VI/VIII)	24		29		26	Display of 2 <sup>nd</sup> Test IA Marks on NB and ERP Communication to parents
TUE	27		26		30		28	28 <sup>th</sup> to 30 <sup>th</sup> MAY 24, I Test for VI Semester	25		30		27	
WED	28		27				29		26		31		28	
THU	29		28				30		27				29	
FRI			29	Holiday – Good Friday			31		28				30	PTM – IVth Semester
SAT			30	30 <sup>th</sup> Mar to 12 <sup>th</sup> April 24, Practical Examination – III Sem B. E		Project Phase-II			29				31	Last Working Day of the semester IV Semester
SUN			31						30					

Note: 1. Students Feedback should be taken immediately after the Test. 2. There will be no additional circular will be sent for dates mentioned for Events in CoE

*S. K. Kulkarni*



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ACADEMIC YEAR:2023-24

## DEPARTMENT OF MECHANICAL ENGINEERING

### COURSE PREFERENCE

Name of the Faculty: *Dr. Mohammed Mathurulla Shereff.*  
Designation: *Asst. Professor*

Sl. No	Course Code and Name	Year/Semester
1	21ME63 - Machine Design	VI / VI
2	Tribology - 18ME822	IV / V
3	BCSC204 D - Introduction to mechanical Engineering	II / II

  
Signature of Faculty



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ACADEMIC YEAR: 2023-24 (Even)

## DEPARTMENT OF MECHANICAL ENGINEERING

### COURSE PREFERENCE

Name of the Faculty: Rakesh .Y D

Designation: Assistant professor

Sl. No	Course Code and Name	Year/Semester
1	Energy Engineering <sup>(8ME81)</sup>	IV/VIII
2	CAED (BCIEDK203)	I/II

Signature of Faculty



# CITY ENGINEERING COLLEGE

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Accredited by NAAC with B+ grade

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ACADEMIC YEAR 2023-24(EVEN)

## DEPARTMENT OF MECHANICAL ENGINEERING COURSE ALLOCATION

Sl.No	Name of the Faculty	Course Code and Name	Year/ Semester	Signature
1	Dr.S.Karunakara	BCEDK203-CAED	I/II	
2	Dr.Uma TR	21ME61-OM BCSCK204D-Introduction to Mechanical Engineering	III/VI I/II	
3	Dr.Matheulla Shariff	BCSCK204D-Introduction to Mechanical Engineering 18ME822-Tribology	I/II IV/VIII	
4	Harsha Vardhan U	21ME62- Heat Transfer BME401-ATD	III/VI II/IV	
5	Anil Kumar R	18ME81-Energy Engineering BSEDC203-CAED Lab	IV/VIII I/II	
6	Shruti Naik	BCEDK203-CAED BSEDC203-CAED Lab	I/II	
7	Sampath HP	21ME63- Machine Design BME404-MMM Lab	III/VI II/IV	
8	Vijay Kumar	21ME641-Traffic Engineering BME403-FLUID MECHANICS	III/VI II/IV	
9	Rakesh YD	BME402-MACHINING SCIENCE & METROLOGY BSEDC203-CAED Lab	II/IV I/II	

Dr. S.Karunakara

HOD



# CITY ENGINEERING COLLEGE

DEPARTMENT OF MECHANICAL ENGINEERING

ODD 2023-2024 TIME TABLE

SEMESTER: IV ME 'A' SEC CBCS

2022 SCHEME

CLASS ROOM: A306

DAY	9:00 - 10:00 AM	10:00 - 11:00 AM	11:00 - 11:15 AM	11:15 AM - 12:15 PM	12:15 PM - 1:15 PM	LUNCH	2:00 – 3:00 PM	3:00 – 4:00 PM	4:00 – 5:00 PM	
MON	BME404	BME402	<b>BREAK</b>	BME401	BME403	<b>L U N C H</b>	BME401	BME404		
TUE	BME402	BME401		BME403	BME404					
WED	BME403	BME401		BME402	BME404		BME403			
THU	BME402	BME401		BME401	BME401		BSCK407	-	SCR	
FRI	BME401	BME401		BMEL305			DEPARTMENT ACTIVITY			
SAT	NSS/SPORTS/YOGA BNSK359/BPEK359/BYO K359			NSS/SPORTS/YOGA BNSK359/BPEK359/BYOK35 9						

SUBJECT CODE	SUBJECT NAME	SUBJECT HANDELED
BME401	Applied Thermodynamics	Prof Harshavardhan
BME402	Machining Science and Metrology	Prof Shruti Naik
BME403	Fluid Mechanics	Prof Sampath
BME404	Mechanical Measurements and Metrology lab	Prof Shruti Naik
BBOK407	Biology For Engineers	Prof Meghana
BSCK307	SCR	Prof Vinay Kumar H M
BNSK359/BPEK359/BYO K359	NSS/SPORTS/YOGA	Mr Rangaswamy

*Skandan*

# CITY ENGINEERING COLLEGE

DEPARTMENT OF MECHANICAL ENGINEERING  
EVEN 2023-2024 TIME TABLE

SEMESTER: VI ME 'A' SME CBCS

2021 SCHEME

CLASS ROOM: A305 W.E.F : 29-04 - 2024

DAY	1	2	TEA	3	4	LUNCH	5	6	7
	9:00 AM 10:00 AM	10:00AM 11:00 AM	11:00 AM 11:15 AM	11:15 AM 12:15 PM	12:15 PM 1:115PM	1:15 PM 2:00 PM	2:00 PM 3:00 PM	3:00 PM 4:00 PM	4:00 PM 5:00 PM
MON	21ME62	21ME641	<b>B R E A K</b>	21CV654	LIBRARY	<b>L U N C H</b>			
TUE	21CV654	21ME641		21ME62	LIBRARY				
WED	21ME641	21ME62		21ME63	LIBRARY				
THU	21ME63	21CV654		21ME61	21ME61				
FRI	21ME61	21ME61		21ME63	LIBRARY				DEPARTMENT ACTIVITY
SAT	NSS/SPORTS/YOGA			NSS/SPORTS/YOGA					

SUBJMET CODE	SUBJMET NAME	SUBJMET HANDELED
21ME61	Production and Operations Management	Dr.Uma TR
21ME62	Heat Transfer	Harsha Vardhan U
21ME63	Machine design	Dr.Md Mathenulla Shariff
21ME64	Supply Chain Management & Introduction to SAP	Anil Kumar R
21CV652	Traffic Engineering	Vinay Kumar SN
21MEL66	CNC Programming and 3-D Printing Lab	Shruti Naik

*Skandan*  
HOD, Dept. of ME

# CITY ENGINEERING COLLEGE

DEPARTMENT OF MECHANICAL ENGINEERING

EVEN 2023-2024 TIME TABLE

SEMESTER: VIII ME 'A' SME CBCS

2018 SCHEME

CLASS ROOM:A104

W.E.F : 19-02-2024

DAY	1	2	TEA	3	4	LUNCH	5	6	7
	9:00 AM 10:00 AM	10:00AM 11:00 AM	11:00 AM 11:15 AM	11:15 AM 12:15 PM	12:15 PM 1:115PM.	1:15 PM 2:00 PM	2:00 PM 3:00 PM	3:00 PM 4:00 PM	4:00 PM 5:00 PM
MON	18ME822	18ME81	<b>B R E A K</b>	18ME822	LIBRARY	<b>L U N C H</b>	MENTOR AND MENTEE INTERACTION		
TUE	18ME81	18ME822		18ME81	LIBRARY		ACTIVITY		
WED	18MEP83/18MEI85			18MEP83/18MEI85			18MEP83/18MEI85		
THU									
FRI									
SAT	18MES84			18MES84					

SUBJMET CODE	SUBJMET NAME	SUBJMET HANDELED
18ME81	Energy Engineering	Anil Kumar R/Rakesh YD
18ME822	Tribolgy	Sampath HP/ Dr.Md Mathenulla Shariff
18MEP83	PROJMET WORK PHASE II	Vijay Kumar
18MES84	SEMINAR	Harsha Vardhan U
18MEI85	INTERSHIP	Dr.Uma TR

*skan*  
HOD, Dept. of ME

# CITY ENGINEERING COLLEGE

DEPARTMENT OF MECHANICAL ENGINEERING  
EVEN 2023-2024 TIME TABLE

Individual Time Table  
Even semester

ANIL KUMAR R

	1	2	TEA	3	4	LUNCH	5	6	7	
<b>DAY</b>	9:00 AM 10:00 AM	10:00AM 11:00 AM	11:00 AM 11:15 AM	11:15 AM 12:15 PM	12:15 PM 1:115PM	1:15 PM 2:00 PM	2:00 PM 3:00 PM	3:00 PM 4:00 PM	4:00 PM 5:00 PM	
<b>MON</b>	IME-E	18ME81	<b>B R E A K</b>	<b>CAED LAB C3</b>		<b>L U N C H</b>	<b>CAED LAB A2</b>			
<b>TUE</b>	18ME81	IME-E		18ME81						
<b>WED</b>	21ME641								<b>CAED LAB B3</b>	
<b>THU</b>	IME-E						21ME641			
<b>FRI</b>							21ME641			
<b>SAT</b>										

*Sk...*  
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**Scheme of Examination:**

One question from Part A: 40 marks

One question from Part B: 40 Marks

Viva voce: 20 Marks

Total: 100 Marks

<b>B. E. MECHANICAL ENGINEERING</b>			
<b>Choice Based Credit System (CBCS) and Outcome Based Education (OBE)</b>			
<b>SEMESTER - VIII</b>			
<b>ENERGY ENGINEERING</b>			
Course Code	<b>18ME81</b>	CIE Marks	40
Teaching Hours /Week (L:T:P)	3:0:0	SEE Marks	60
Credits	03	Exam Hours	03
<b>Course Learning Objectives:</b>			
<ul style="list-style-type: none"> <li>• Understand energy scenario, energy sources and their utilization</li> <li>• Learn about energy conversion methods</li> <li>• Study the principles of renewable energy conversion systems.</li> </ul>			
<b>Module-1</b>			
<b>STEAM GENERATORS</b> Coal and ash handling, Generation of steam using forced circulation, high and supercritical pressures, LaMount, Benson, Velox, Loeffler, Schmidt steam generators, Cooling towers and Ponds, Accessories such as Superheaters, De-superheater, Economizers, Air preheaters.			
<b>Module-2</b>			
<b>Solar Energy:</b> Introduction, Solar radiation at the earth's surface, Solar radiation measurements, Flat plate collectors, Focussing collectors, Solar pond, Solar electric power generation-Solar photovoltaics. <b>Biomass Energy:</b> Photosynthesis, photosynthetic oxygen production, energy plantation. Bio Chemical Route: Biogas production from organic wastes by anaerobic fermentation, Bio gas plants-KVIC, Janta, Deenbhandu models, factors affecting bio gas generation. Thermal gasification of biomass, updraft and downdraft			
<b>Module-3</b>			
<b>Geothermal Energy:</b> Forms of geothermal energy, Dry steam, wet steam, hot dry rock and magmatic chamber systems. <b>Tidal Energy:</b> Tidal power, Site selection, Single basin and double basin systems, Advantages and disadvantages of tidal energy. <b>Wind Energy:</b> Wind energy-Advantages and limitations, wind velocity and wind power, Basic components of wind energy conversion systems, horizontal and vertical axis wind mills, coefficient of performance of a wind mill rotor, Applications of wind energy.			
<b>Module-4</b>			
<b>Hydroelectric plants:</b> Advantages & disadvantages of water power, Hydrographs and flow duration curves-numericals, Storage and pondage, General layout of hydel power plants- components such as Penstock, surge tanks, spill way and draft tube and their applications, pumped storage plants, Detailed classification of hydroelectric plants, water hammer. <b>Ocean Thermal Energy:</b> Ocean thermal energy conversion, Principle and working of Rankine cycle, Problems associated with OTEC.			
<b>Module-5</b>			
<b>NUCLEAR ENERGY</b> Principles of release of nuclear energy-Fusion and fission reactions. Nuclear fuels used in the reactors, Chain reaction, Moderation, breeding, Multiplication and thermal utilization factors. General components of a nuclear reactor and materials, Brief description-Pressurized water reactor, Boiling water reactor, Sodium graphite reactor, Fast Breeder reactor, Homogeneous graphite reactor and gas cooled reactor, Radiation hazards, Shielding, Nuclear waste, Radioactive waste disposal.			
<b>Course Outcomes:</b> At the end of the course the student will be able to:			
CO1: Understand the construction and working of steam generators and their accessories.			



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## DEPARTMENT OF MECHANICAL ENGINEERING LESSON PLAN FOR EVEN SEMESTER FOR ACADEMIC YEAR 2023-24

Course Title: <b>ENERGY ENGINEERING</b>	Course Code : <b>18ME81</b>
Total contact hours: L:T:P ::3:0:0	End Term Marks : 60
Internal Marks : 40	
Semester : VIII	Academic year : 2022-23
Lesson plan Author: Anil Kumar R	Date :10/03/2024

### Course Learning Objective:

- Understand energy scenario, energy sources and their utilization
- Learn about energy conversion methods
- Study the principles of renewable energy conversion systems.

### Course Outcomes:

At the end of the course the student will be able to:

CO1: Understand the construction and working of steam generators and their accessories.

CO2: Identify renewable energy sources and their utilization.

CO3: Understand principles of energy conversion from alternate sources including wind, geothermal, ocean, biomass, nuclear, hydel and tidal.

### Module-1

Week	Days/ Date	Contents of Unit	Bloom's Taxonomy Level	Course Outcome (CO)
1	1	STEAM GENERATORS: Coal and ash handling, Generation of steam using forced circulation,	R,U	CO1
	2	high and supercritical pressures, LaMount, Benson, Velox,	R,U	CO1
	3	Loeffler, Schmidt steam generators,	R,U	CO1,C02
2	1	Cooling towers and Ponds,	R,U	C01,C02
	2	Accessories such as Superheaters, De-superheater, Economizers, Air preheaters.	A1,A2	C01,C02



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## Module-2

Week	Days/ Date	Contents of Unit	Bloom's Taxonomy Level	Course Outcome (CO)
2	3	Solar Energy: Introduction, Solar radiation at the earth's surface,	R,U	CO1
3	1	Solar radiation measurements, Flat plate collectors	R,U	CO1
	2	Focussing collectors, Solar pond,	R,U	CO1
	3	Solar electric power generation-Solar photovoltaics.	R,U	CO1
4	1	Biomass Energy: Photosynthesis, photosynthetic oxygen production, energy plantation.	R,U	CO1
	2	Bio Chemical Route: Biogas production from organic wastes by anaerobic fermentation,	R,U	CO1
	3	Bio gas plants-KVIC, Janta, Deenbandu models, factors affecting bio gas generation.	R,U	CO1
5	1	Thermal gasification of biomass, updraft and downdraft	R,U	CO1

## Module-3

Week	Days/ Date	Contents of Unit	Bloom's Taxonomy Level	Course Outcome (CO)
5	2	Geothermal Energy: Forms of geothermal energy, Dry steam, wet steam, hot dry rock and magmatic chamber systems.	R,U	CO1
	3	Tidal Energy: Tidal power, Site selection, Single basin and double basin systems,		
6	1	Advantages and disadvantages of tidal energy.	R,U	CO1
	2	Wind Energy: Wind energy-Advantages and limitations,	R,U	CO1
	3	wind velocity and wind power, Basic components of wind energy conversion systems,	R,U	CO1
7	1	horizontal and vertical axis wind mills,	R,U	CO1
	2	coefficient of performance of a wind mill rotor,	R,U	CO1
	3	Applications of wind energy.	R,U	CO1



Module-4

Week	Days/Date	Contents of Unit	Bloom's Taxonomy Level	Course Outcome (CO)
8	1	Hydroelectric plants: Advantages & disadvantages of water power,	R,U	CO1
	2	Hydrographs and flow duration curves		
	3	numericals, Storage and pondage		
9	1	, General layout of hydel power plants-components such as Penstock, surge tanks, ,	R,U	CO1
	2	spill way and draft tube and their applications, pumped storage plants	R,U	CO1
	3	Detailed classification of hydroelectric plants, water hammer.	R,U	CO1
10	1	. Ocean Thermal Energy: Ocean thermal energy conversion,	R,U	CO1
	2	Principle and working of Rankine cycle,	R,U	CO1
	3	Problems associated with OTEC	R,U	CO1

Module-5

Week	Days/Date	Contents of Unit	Bloom's Taxonomy Level	Course Outcome (CO)
11	1	NUCLEAR ENERGY Principles of release of nuclear energy-Fusion and fission reactions.	R,U	CO1
	2	Nuclear fuels used in the reactors,		
	3	Chain reaction, Moderation, breeding, Multiplication and thermal utilization factors.		
12	1	General components of a nuclear reactor and materials,	R,U	CO1
	2	Brief description-Pressurized water reactor,	R,U	CO1
	3	Boiling water reactor, Sodium graphite reactor,.	R,U	CO1
13	1	Fast Breeder reactor, Homogeneous graphite reactor and gas cooled reactor,	R,U	CO1
	2	Radiation hazards, Shielding, Nuclear waste,	R,U	CO1
	3	Radioactive waste disposal	R,U	CO1





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Sl No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
<b>Textbook/s</b>				
1	Power Plant Engineering	P. K. Nag	Tata McGraw Hill Education Private Limited, New Delhi	Third Edition, 2012.
2	Power Plant Engineering	Arora and Domkundwar	Dhanpat Rai & Co. (P) Ltd.	Sixth Edition, 2012.
3	Non-conventional Sources of Energy	G.D.Rai	Khanna Publishers, New Delhi	Fifth Edition, 2015.
4	Non-conventional energy resources	B H Khan	McGraw Hill Education	3rd Edition
<b>Reference Books</b>				
1	Power Plant Engineering	R. K. Rajput	Laxmi publication New Delhi	
2	Principles of Energy conversion	A. W. Culp Jr	McGraw Hill	1996
3	Power Plant Technology	M.M. EL-Wakil	McGraw Hill International	1994
4	Solar Energy: principles of Thermal Collection and Storage	S.P. Sukhatme	Tata McGraw-Hill	1984

Signature of Faculty

Signature of HOD



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Question Bank-1	
1	Layout of thermal power plant with description
2	Describe with neat sketches overfeed and underfeed stokers
3	Explain with neat sketch any one boiler used in thermal power plant
4	Write briefly about cooling tower with sketch
5	Write a note on drought system
6	Explain briefly about Super heater, Re-heater and Economizer
7	Classify cooling towers
8	With a neat sketch explain diesel power plant
9	Explain any two engine starting methods
10	With neat sketch explain any one lubricating system



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<b>Question Bank 2</b>	
1.	Explain the working principle of biomass energy
2.	Explain fixed dome plant of biomass energy
3.	Explain the principle of ocean thermal energy
4.	Discuss geothermal energy in detail
5.	Explain biomass energy conversion concept
6.	List down the advantages and disadvantages of GTE
7.	Discuss the process principle of nuclear energy
8.	List down the advantages and disadvantages of nuclear energy
9.	Describe in detail about fuel cell
10.	Explain zero energy concepts

USN

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COURSE CODE:18ME81

**CITY ENGINEERING COLLEGE**  
**BANGALORE - 62**  
**SECOND INTERNAL TEST**

S. Kankana

PROGRAMME: MECHANICAL ENGINEERING  
 COURSE NAME: ENERGY ENGINEERING  
 SEM: VIII  
 Duration: 1.30 Hrs

DATE:19-04-2024  
 TIME: 10.30 - 12.00 pm

MAX MARKS: 50

*Note: Answer any FIVE questions choosing at least one from each Part.*

Sl.No	PART - A	Marks	CO	BT
1.	With neat sketch explain any one lubricating system	10	C02	BT2
	OR			
2.	Classify hydro electric power plants	10	C02	BT2
	PART - B			
3.	List down different types of surge tanks and explain any one.	10	C02	BT2
	OR			
4.	With a neat sketch explain working of solar power plant	10	C02	BT2
	PART-C			
5.	Explain any two applications of solar energy	10	C03	BT2
	OR			
6.	With a neat sketch explain horizontal wind axis Mill	10	C03	BT2
	PART-D			
7.	With a neat sketch explain Vertical wind axis Mill	10	C03	BT2
	OR			
8.	Explain in detail about any one lubrication system in diesel power plant	10	C03	BT2
	PART-E			
9.	Discuss various factors affect the efficiency of wind mill	10	C03	BT2
	OR			
10.	Describe about different hydro power plants installed in Karnataka and their capacity	10	C03	BT2

**CITY ENGINEERING COLLEGE**  
**DEPARTMENT OF Mechanical Engineering,**

**SCHEME FOR VALUATION**

Semester & Section: VII & A Internal Test II

Date: 18/04/2024

Question No.	Details of the Answer	Marks Distribution	Total Marks
1	Sketch Explanation	05 } 05 }	10
2	Classification	10	10
3	List Any one Sargent tank - Sketch Explanation	03 } 03 } 04 }	10
4	Solar power plant - Sketch Explanation	05 } 05 }	10
5	Any two application of Solar Energy	02 X 5	10
6	Horizontal horizontal wind axis mill - Sketch Explanation	05 } 05 }	10
7	Vertical wind axis mill - Sketch Explanation	05 } 05 }	10
8	Sketch Explanation	05 } 05 }	10
9	Various factors Effects efficiency of wind mill (Any Five)	02 X 5	10
10	Any five	02 X 5	10

S. Kanna

Staff

HOD











# IBME 81 - Energy Engineering,

Date	Topics Planned
12/2/24	STEAM GENERATORS: Coal and ash handling, Generation of steam using forced circulation,
13/2/24	high and supercritical pressures, LaMount, Benson, Velox,
13/2/24	Loeffer, Schmidt steam generators,
19/2/24	Cooling towers and Ponds,
26/2/24	Accessories such as Superheaters, De-superheater, Economizers, Air preheaters.
20/2/24	Solar Energy: Introduction, Solar radiation at the earth's surface,
20/2/24	Solar radiation measurements, Flat plate collectors
26/2/24	Focussing collectors, Solar pond,
27/2/24	Solar electric power generation-Solar photovoltaics.
27/2/24	Biomass Energy: Photosynthesis, photosynthetic oxygen production, energy plantation.
4/03/24	Bio Chemical Route: Biogas production from organic wastes by anaerobic fermentation,
5/03/24	Bio gas plants-KVIC, Janta, Deenbandu models, factors affecting bio gas generation.
5/03/24	Thermal gasification of biomass, updraft and downdraft
11/03/24	Geothermal Energy: Forms of geothermal energy, Dry steam, wet steam, hot dry rock and magmatic chamber systems.
12/03/24	Tidal Energy: Tidal power, Site selection, Single basin and double basin systems,
12/03/24	Advantages and disadvantages of tidal energy.
12/03/24	Wind Energy: Wind energy-Advantages and limitations,
19/03/24	wind velocity and wind power, Basic components of wind energy conversion systems,
19/03/24	horizontal and vertical axis wind mills,
19/03/24	coefficient of performance of a wind mill rotor,
14/24	Applications of wind energy.
2/4/24	Hydroelectric plants: Advantages & disadvantages of water power,
2/4/24	Hydrographs and flow duration curves
8/4/24	numericals, Storage and pondage
15/4/24	, General layout of hydel power plants- components such as Penstock, surge tanks, ,
16/4/24	spill way and draft tube and their applications, pumped storage plants
22/4/24	Detailed classification of hydroelectric plants, water hammer.
23/4/24	. Ocean Thermal Energy: Ocean thermal energy conversion,
23/4/24	Principle and working of Rankine cycle,
24/24	Problems associated with OTEC
29/4/24	NUCLEAR ENERGY Principles of release of nuclear energy-Fusion and fission reactions.
30/4/24	Nuclear fuels used in the reactors,
30/4/24	Chain reaction, Moderation, breeding, Multiplication and thermal utilization factors.
30/4/24	General components of a nuclear reactor and materials,
6/05/24	Brief description-Pressurized water reactor,
6/05/24	Boiling water reactor, Sodium graphite reactor,.
7/05/24	Fast Breeder reactor, Homogeneous graphite reactor and gas cooled reactor,
7/5/24	Radiation hazards, Shielding, Nuclear waste,
7/5/24	Radioactive waste disposal



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## DEPARTMENT OF MECHANICAL ENGINEERING

### CIRCULAR

Ref No: CEC/ME/DAC/ACY 2023-2024/01

Date: 27-08-2023

This is to inform the members of Department Advisory Committee that meeting is scheduled on 05-09-2023 at 11: 00 AM in department at HMT Lab.

#### Agenda:

- Conduct an orientation for 3<sup>rd</sup> semester students
- Planning of Internships for 5<sup>th</sup> semester students
- Involving students in technical activities
- Conducting workshop/seminar/guest lectures

*S. Karunakara*

**Dr. S.Karunakara**

**HOD**



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## DEPARTMENT OF MECHANICAL ENGINEERING

### Department Advisory Committee Meeting

**Date: 05/09/2023**

**Time: 11:00 AM**

**Venue: HMT Lab**

DAC Members Present:

Sl. No	Member Name	Designation	Role
1	Dr. S.Karunakara	HOD	Convenor
2	Dr. Uma TR	Professor	Member
3	Dr. Mathenulla Shariff	Professor	Member
4	Mr. Harsha Vardhan U	Assistant Professor	Co-Convenor
5	Mrs. Shruti Naik	Assistant Professor	Member
6	Mr. Anil Kumar R	Assistant Professor	Member
7	Mr.Sampath HP	Assistant Professor	Member
8	Mr.Rakesh YD	Assistant Professor	Member
9	Mr.Vijay Kumar M	Assistant Professor	Member
10	Suraj Kumar Y	Devops Engineer	Alumni

The Department Advisory Committee meeting was conducted at Department, on 5<sup>th</sup> September, 2023, at 11 AM.

#### Agenda of the Meeting:

- Conduct an orientation for 3<sup>rd</sup> semester students
- Planning of Internships for 5<sup>th</sup> semester students
- Involving students in technical activities
- Conducting workshop/seminar/guest lectures.



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## Minutes of Meeting:

During the Department Advisory Committee meeting, an overview of the department was provided, showcasing student achievement, and faculty accomplishments and contributions. The members discussed suggestions for improvement and reviewed the meeting agenda.

The following points were discussed in the meeting:

- Committee members suggested establishing MOUs with various IT industries to provide students with internship opportunities.
- It was proposed to conduct a technical symposium with increased student participation.
- The committee decided to organize guest lecture, industry visit, and workshop for students in the 3rd, 5th, and 7th semesters.
- It was discussed to conduct an orientation for third-semester students to raise awareness about the 22-Scheme curriculum, particularly regarding registration for NSS, Yoga, or Physical Education.
- The HOD emphasized the importance of societal projects and the need to find opportunities for such initiatives.



**Dr. S.Karunakara**

**HOD**



**CITY ENGINEERING COLLEGE, BENGALURU-560061. ACADEMIC CALENDAR 2023-24 Odd SEM Revised on 29/12/2023**

		OCT 2023	NOV 2023	DEC 2023	JAN 2024	FEB 2024	March 2024	April 2024	
DAY	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	
SUN	1								
MON	2	GANDHI JAYANTHI			1	II test for I st sem , III test for VII sem, I st test V sem, & III sem		1	Start of 4th sem
TUE	3				2			2	
WED	4		1	RAJYOTSAVA DAY	3			3	
THU	5		2		4			4	
FRI	6		3		5		1	5	
SAT	7	1st Saturday holiday	4	1st Saturday holiday	6	Last Working day 7 Sem	2	6	1st Saturday holiday
SUN	8		5		7		3	7	
MON	9		6	Ist test I sem and VII sem	8	Practical Exam 7 sem	4	8	III test for V sem, Start of theory 3 <sup>rd</sup> Start of 2nd sem
TUE	10		7		9		5	9	Ugadhi, Ramzan
WED	11		8		10		6	10	
THU	12		9		11		7	11	
FRI	13		10		12		8	12	Maha Shivarathri
SAT	14	MAHALAYA AMAVASA	11		13		9	13	Last working day-5th
SUN	15		12		14		10	14	
MON	16		13		15	Sankranthi	11	15	Start of practical 5th
TUE	17		14	BALIPADYAMI	16		12	16	
WED	18		15	Start of 3rd sem	17		13	17	
THU	19		16		18		14	18	
FRI	20		17		19		15	19	
SAT	21	2nd Saturday holiday	18	2nd Saturday holiday	20	Last Working day I Sem	16	20	3rd Saturday holiday
SUN	22		19		21		17	21	
MON	23	AYUDHA POOJA	20		22	THEORY EXAM I & 7 sem	18	22	Start of 6th sem
TUE	24	VIJAYA DASHAMI	21		23		19	23	
WED	25	Start of 5th sem INTERNSHIP	22		24		20	24	
THU	26		23		25		21	25	
FRI	27		24		26	Republic day	22	26	Start of theory 5th
SAT	28	VALMIKI JAYANTHI	25	Start of 5th sem class	27		23	27	
SUN	29		26		28		24	28	
MON	30		27		29	CHRISTMAS	25	29	
TUE	31		28		30		26	30	
WED			29		31		27		
THU			30	KANAKADASA JAYANTHI			28		
FRI							29		Good Friday
SAT							30		
SUN							31		



**CITY ENGINEERING COLLEGE, BENGALURU-560061. ACADEMIC CALENDAR 2023-24 Odd SEM, Dept. Of ME**

OCT 2023		NOV 2023		DEC 2023		JAN 2024		FEB 2024		March 2024		April 2024		
DAY	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT	Date	EVENT
SUN	1													
MON	2	GANDHI JAYANTHI					1	II test for 1st sem ,					1	Start of 4th sem
TUE	3						2	III test for VII sem,					2	
WED	4		1	RAJYOTSAVA DAY			3	I st test V sem, &					3	
THU	5		2				4	III sem	1				4	
FRI	6		3		1		5		2		1		5	
SAT	7	1st Saturday holiday	4	1st Saturday holiday	2		6	Last Working day	3	1st Saturday holiday	2	1st Saturday holiday	6	1st Saturday holiday
SUN	8		5		3		7	I & 7	4		3		7	
MON	9		6	Ist test I sem and VII sem	4		8	Practical Exam	5	2nd test 3 <sup>rd</sup> sem V sem,	4	III test for V sem, Start of theory 3 <sup>rd</sup>	8	
TUE	10		7		5	9		6			5		9	Ugadhi, Ramzan
WED	11		8		6	10		7			6		10	
THU	12		9		7	11		8			7		11	
FRI	13		10		8	12		9			8		12	Maha Shivarathri
SAT	14	MAHALAYA AMAVASA	11		9		13		10		9	Last working day-5th	13	
SUN	15		12		10		14		11		10		14	
MON	16		13		11		15	Sankranthi	12		11	Start of practical 5th	15	
TUE	17		14	BALIPADYAMI	12		16		13	Start of 8th sem	12		16	
WED	18		15	Start of 3rd sem	13		17		14		13		17	
THU	19		16		14		18		15		14		18	
FRI	20		17		15		19		16		15		19	
SAT	21	3rd Saturday holiday	18	Graduation Day 3rd Saturday holiday	16	3rd Saturday holiday	20	3rd Saturday holiday	17	3rd Saturday holiday	16	3rd Saturday holiday	20	3rd Saturday holiday
SUN	22		19		17		21		18		17		21	
MON	23	AYUDHA POOJA	20		18		22	THEORY EXAM 1 & 7	19	Start of 2 <sup>nd</sup> sem	18		22	Start of 6th sem
TUE	24	VIJAYA DASHAMI	21		19		23		20	Last working day-3rd	19		23	
WED	25	Start of 5th sem INTERNSHIP	22		20		24		21	Start of practical 3 <sup>rd</sup> sem	20		24	
THU	26		23		21		25	Industrial Visit - V sem	22		21		25	
FRI	27		24		22		26	Republic day	23		22	Start of theory 5th	26	
SAT	28	VALMIKI JAYANTHI	25	Start of 5th sem class	23		27		24		23		27	
SUN	29		26		24		28		25		24		28	
MON	30		27		25	CHRISTMAS	29		26		25	Holi	29	
TUE	31		28		26		30		27		26		30	
WED			29		27		31		28		27			
THU			30	KANAKADASA JAYANTHI	28				29		28			
FRI					29						29	Good Friday		
SAT					30						30			
SUN					31						31			

*S. Kantana*



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ACADEMIC YEAR: 2023-24 (odd)

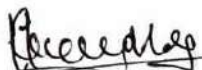
## Department of Mechanical Engineering

### COURSE PREFERENCE

Name of the Faculty: Harsha Vardhan.U

Designation: Assistant professor.

Sl. No	Course Code and Name	Year/Semester
1.	BME304   Basic Thermodynamics	II / IV
2.	21ME53   FEA	III / VI
3.	21ME52   Thermo fluids Engineering	IV / VI

  
Signature of Faculty





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ACADEMIC YEAR: 2023-24 (Odd)

## Department of Mechanical Engineering

### COURSE PREFERENCE

Name of the Faculty: Anil Kumar . R

Designation: Assistant professor

Sl. No	Course Code and Name	Year/Semester
1	BCSCK104D / Introduction to Mechanical Engg	I / I
2	18ME734 / TQM	IV / VII
3	21ME54 / Hybrid Vehicles	III / V

*Anil Kumar . R*

Signature of Faculty



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ACADEMIC YEAR: 2023-24(ODD)

## DEPARTMENT OF MECHANICAL ENGINEERING

### COURSE ALLOCATION

#### COURSE ALLOCATION

Sl.No	Name of the Faculty	Course Code and Name	Year/ Semester	Signature
1	Dr.S.Karunakara	BCEDK103-CAED 18ME741-Additive Manufacturing	I/I IV/VII	
2	Dr.Uma TR	18ME71-Controlling Engineering BCSCK104D-Introduction to Mechanical Engineering	IV/VII I/I	
3	Dr.Matheulla Shariff	21ME51- MOM BCSCK104D-Introduction to Mechanical Engineering	III/V I/I	
4	Harsha Vardhan U	21ME52-Thermo-fluids Engineering BME304-BTD	III/V II/III	
5	Anil Kumar R	18ME72-CADM 21ME54-Modern Mobility BSEDC103-CAED Lab	IV/VII III/V	
6	Shruti Naik	BCEDK103-CAED BSEDC103-CAED Lab	I/I	
7	Sampath HP	21ME51- TOM 21MEL55-Design Lab	III/V III/V	
8	Vijay Kumar	18ME734-TQM 21ME52-Thermo-fluids Engineering	II/III III/V	
9	Rakesh YD	BME302-MSM CIM Lab-18MEL76 BSEDC103-CAED Lab	II/III IV/VII I/I	

S. Karunakara

# CITY ENGINEERING COLLEGE

DEPARTMENT OF MECHANICAL ENGINEERING

ODD 2023-2024 TIME TABLE

SEMESTER: III ME 'A' SEC CBCS

2022 SCHEME

CLASS ROOM: A306

DAY	9:00 - 10:00 AM	10:00 - 11:00 AM	11:00 - 11:15 AM	11:15 AM - 12:15 PM	12:15 PM - 1:15 PM	LUNCH	2:00 - 3:00 PM	3:00 - 4:00 PM	4:00 - 5:00 PM	
MON	BME304	BME302	BREAK	BME301	BME303	L U N C H	BME301	BME304		
TUE	BME302	BME301		BME303	BME304					
WED	BME303	BME301		BME302	BME304		BME303			
THU	BME302	BME301		BME301	BME301		BSCK307	-	SCR	
FRI	BME301	BME301		BMEL305			DEPARTMENT ACTIVITY			
SAT	NSS/SPORTS/YOGA BNSK359/BPEK359/BYOK359			NSS/SPORTS/YOGA BNSK359/BPEK359/BYOK359						

SUBJECT CODE	SUBJECT NAME	SUBJECT HANDELED
BME301	Mechanics of Materials	Prof Sampath H P
BME302	Manufacturing Process	Prof Anil Kumar R
BME303	Material Science and Engineering	Prof Rakesh Y D
BME304	Basic Thermodynamics	Prof Harshavardhan U
BMEL305	Introduction to Modelling and Design for Manufacturing	Prof Shruti Naik
BSCK306	SCR	Prof Vinay Kumar H M

S. Karthikeyan

HOD, Dept. of ME

# CITY ENGINEERING COLLEGE

DEPARTMENT OF MECHANICAL ENGINEERING

ODD 2023-2024 TIME TABLE

SEMESTER: V ME 'A' SME CBCS

2021 SCHEME

CLASS ROOM: A305

DAY	1	2	TEA	3	4	LUNCH	5	6	7
	9:00 - 10:00 AM	10:00 - 11:00 AM	11:00 - 11:15 AM	11:15 AM - 12:15 PM	12:15 PM - 1:15 PM	LUNCH	2:00 - 3:00 PM	3:00 - 4:00 PM	4:00 - 5:00 PM
MON	21ME54	21ME53	<b>B R E A K</b>	21ME52	TUT	<b>L U N C H</b>	21ME52	A2	
TUE	21ME51	21ME56		21ME52	TUT		21ME52	A1	
WED	21ME53	21ME51		21ME56	TUT		21ME581	A1	
THU	21CIV57	21ME51		21ME54	TUT		21MEL55	A2	
FRI	21ME52	21ME53		21ME54	TUT		21ME581	A2	
SAT	NSS/SPORTS/YOGA			NSS/SPORTS/YOGA			21MEL55	A1	
					<b>DEPARTMENT ACTIVITY</b>				

SUBJMET CODE	SUBJMET NAME	SUBJMET HANDELED
21ME51	Theory of Machines	Dr.Md Mathenulla Shariff/ Sampath HP
21ME52	Thermo-fluids Engineering	Harsha Vardhan U/ Vijay Kumar N
21ME53	Finite Element Analysis	Dr.S.Karunakara
21ME54	Modern Mobility and Automotive Mechanics	Rakesh YD/ Anil Kumar R
21MEL55	Design lab	Dr.Md Mathenulla Shariff
21ME56	Research Methodology & IntellMEtual Property Rights	Dr.Uma.TR
21CIV57	Environmental Studies	Vinay Kumar SN
21ME581	Basics of MATLAB	Anil Kumar R

*S. Karunakar*

HOD, Dept. of ME

# CITY ENGINEERING COLLEGE

DEPARTMENT OF MECHANICAL ENGINEERING  
ODD 2023-2024 TIME TABLE

SEMESTER: VII ME 'A' SME CBCS

2018 SCHEME

CLASS ROOM: A307

DAY	1	2	TEA	3	4	LUNCH	5	6	7
	9:00 - 10:00 AM	10:00 - 11:00 AM	11:00 - 11:15 AM	11:15 AM - 12:15 PM	12:15 PM - 1:15 PM	LUNCH	2:00 - 3:00 PM	3:00 - 4:00 PM	4:00 - 5:00 PM
MON	18ME741	18ME734	<b>B R E A K</b>	18ME72	TUT	<b>L U N C H</b>	PROJMET WORK		
TUE	18ME71	18ME741		18CV752	TUT		PROJMET WORK		
WED	18CV752	18ME71		18ME734	TUT		18MEL76		
THU	18ME71	18ME72		18ME734	TUT		18MEL77		
FRI	18ME72	18CV752		18ME741	TUT		PROJMET WORK		
SAT	PROJMET WORK			PROJMET WORK					

SUBJMET CODE	SUBJMET NAME	SUBJMET HANDELED
18ME71	Control Engineering	Dr.Uma TR
18ME72	Computer Aided Design and Manufacturing	Anil Kumar R/ Rakesh YD
18ME731	Total Quality Management	Vijay Kumar / Anil Kumar R
18ME741	Additive Manufacturing	Dr.S.Karunakara
18CV752	Environmental Protection and Management	Vinay Kumar SN
18MEL76	CIM LAB	Rakesh YD/Anil Kumar R

*S. Karunakara*  
HOD, Dept. of ME

# CITY ENGINEERING COLLEGE

DEPARTMENT OF MECHANICAL ENGINEERING

ODD 2023-2024 TIME TABLE

Individual Time Table

ANIL KUMAR R

DAY	9:00 - 10:00 AM	10:00 - 11:00 AM	11:00 - 11:15 AM	11:15 AM - 12:15 PM	12:15 PM - 1:15 PM	LUNCH	2:00 - 3:00 PM	3:00 - 4:00 PM	4:00 - 5:00 PM
MON		BME302	BREAK	18ME72		L U N C H	CAED LAB D2		
TUE	BME302			CAED LAB F2			CAED LAB E1		
WED				BME302			21ME581		
THU	BME302	18ME72							
FRI	18ME72								
SAT									

S. Kulkarni

HOD, Dept. of ME

**B. E. MECHANICAL ENGINEERING**  
**Choice Based Credit System (CBCS) and Outcome Based Education (OBE)**  
**SEMESTER - VII**

**COMPUTER AIDED DESIGN AND MANUFACTURING**

Course Code	18ME72	CIE Marks	40
Teaching Hours /Week (L:T:P)	3:0:0	SEE Marks	60
Credits	03	Exam Hours	03

**Course Learning Objectives:**

- To impart knowledge of CIM and Automation and different concepts of automation by developing mathematical models.
- To make students to understand the Computer Applications in Design and Manufacturing [CAD / CAM] leading to Computer integrated systems. Enable them to perform various transformations of entities on display devices.
- To expose students to automated flow lines, assembly lines, Line Balancing Techniques, and Flexible Manufacturing Systems.
- To expose students to computer aided process planning, material requirement planning, capacity planning etc.
- To expose the students to CNC Machine Tools, CNC part programming, and industrial robots.
- To introduce the students to concepts of Additive Manufacturing, Internet of Things, and Industry 4.0 leading to Smart Factory.

**Module-1**

**Introduction to CIM and Automation:** Automation in Production Systems, automated manufacturing systems- types of automation, reasons for automating, Computer Integrated Manufacturing, computerized elements of a CIM system, CAD/CAM and CIM. Mathematical models and matrices: production rate, production capacity, utilization and availability, manufacturing lead time, work-in- process, numerical problems.

**Automated Production Lines and Assembly Systems:** Fundamentals, system configurations, applications, automated flow lines, buffer storage, control of production line, analysis of transfer lines, analysis of flow lines without storage, partial automation, analysis of automated flow lines with storage buffer, fundamentals of automated assembly systems, numericals.

**Module-2**

**CAD and Computer Graphics Software:** The design process, applications of computers in design, software configuration, functions of graphics package, constructing the geometry.

**Transformations:** 2D transformations, translation, rotation and scaling, homogeneous transformation matrix, concatenation, numerical problems on transformations.

**Computerized Manufacture Planning and Control System:** Computer Aided Process Planning, Retrieval and Generative Systems, benefits of CAPP, Production Planning and Control Systems, typical activities of PPC System, computer integrated production management system, Material Requirement Planning, inputs to MRP system, working of MRP, outputs and benefits, Capacity Planning, Computer Aided Quality Control, Shop floor control

**Module-3**

**Flexible Manufacturing Systems:** Fundamentals of Group Technology and Flexible Manufacturing Systems, types of FMS, FMS components, Material handling and storage system, applications, benefits, computer control systems, FMS planning and design issues, Automated Storage and Retrieval Systems, AS/RS and Automatic parts identification systems and data capture.

**Line Balancing:** Line balancing algorithms, methods of line balancing, numerical problems on largest candidate rule, Kilbridge and Wester method, and Ranked Positional Weights method, Mixed Model line

balancing, computerized line balancing methods.

#### Module-4

**Computer Numerical Control:** Introduction, components of CNC, CNC programming, manual part programming, G Codes, M Codes, programming of simple components in turning, drilling and milling systems, programming with canned cycles. Cutter radius compensations.

**Robot Technology:** Robot anatomy, joints and links, common robot configurations, robot control systems, accuracy and repeatability, end effectors, sensors in robotics. Robot programming methods: on-line and off-line methods. Robot industrial applications: material handling, processing and assembly and inspection.

#### Module-5

**Additive Manufacturing Systems:** Basic principles of additive manufacturing, slicing CAD models for AM, advantages and limitations of AM technologies, Additive manufacturing processes: Photo polymerization, material jetting, binder jetting, material extrusion, Powder bed sintering techniques, sheet lamination, direct energy deposition techniques, applications of AM.

**Future of Automated Factory:** Industry 4.0, functions, applications and benefits. Components of Industry 4.0, Internet of Things (IOT), IOT applications in manufacturing, Big-Data and Cloud Computing for IOT, IOT for smart manufacturing, influence of IOT on predictive maintenance, industrial automation, supply chain optimization, supply-chain & logistics, cyber-physical manufacturing systems.

**Course Outcomes:** At the end of the course, the student will be able to:

CO1: Define Automation, CIM, CAD, CAM and explain the differences between these concepts. Solve simple problems of transformations of entities on computer screen

CO2: Explain the basics of automated manufacturing industries through mathematical models and analyze different types of automated flow lines.

CO3: Analyse the automated flow lines to reduce time and enhance productivity.

CO4: Explain the use of different computer applications in manufacturing, and able to prepare part programs

for simple jobs on CNC machine tools and robot programming.

CO5: Visualize and appreciate the modern trends in Manufacturing like additive manufacturing, Industry 4.0 and applications of Internet of Things leading to Smart Manufacturing.

#### Question paper pattern:

- The question paper will have ten full questions carrying equal marks.
- Each full question will be for 20 marks.
- There will be two full questions (with a maximum of four sub-questions) from each module.
- Each full question will have sub-question covering all the topics under a module.
- The students will have to answer five full questions, selecting one full question from each module.

Sl No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
<b>Textbook/s</b>				
1	Automation, Production Systems and Computer-Integrated Manufacturing	Mikell P Groover	Pearson Learning.	4 <sup>th</sup> Edition, 2015
2	CAD / CAM Principles and Applications	P N Rao	Tata McGraw-Hill	3 <sup>rd</sup> Edition, 2015
3	CAD/CAM/CIM	Dr. P. Radhakrishnan	New Age International Publishers, New Delhi.	3 <sup>rd</sup> edition
<b>Reference Books</b>				
1	"CAD/CAM"	Ibrahim Zeid	Tata McGraw Hill.	
2	Principles of Computer Integrated Manufacturing	S.Kant Vajpayee	, Prentice Hall of India, New Delhi.	1999



3	Work Systems And The Methods, Measurement And Management of Work	Groover M. P., Pearson	Prentice Hall	Upper Saddle River, NJ, 2007.
4	Computer Automation in Manufacturing	Boucher, T. O., Chapman & Hall	London, UK,	1996.
5	Introduction to Robotics: Mechanics And Control	Craig, J. J.	Addison-Wesley Publishing Company	2 <sup>nd</sup> Ed 1989.
6	Internet of Things (IoT): Digitize or Die: Transform your organization. Embrace the digital evolution. Rise above the competition	Nicolas Windpassinger	Amazon.	
7	Internet of Things: A Hands-on Approach"	ArshdeepBahga and Vijay Madiseti	Universities Press	
8	Additive Manufacturing Technologies: Rapid Prototyping to Direct Digital Manufacturing,	Ian Gibson, David W. Rosen, Brent Stucker		2nd Ed. (2015)
9	Understanding Additive Manufacturing	Andreas Gebhardt, Hanser Publishers		2011
10	Understanding Additive Manufacturing",	Andreas Gebhardt,	Hanser Publishers,	2011



**DEPARTMENT OF MECHANICAL ENGINEERING**  
**LESSON PLAN FOR EVEN SEMESTER FOR ACADEMIC YEAR 2023-24**

Course Title: <b>COMPUTER AIDED DESIGN AND MANUFACTURING</b>	Course Code :18ME72
Total contact hours: L:T:P ::3:0:0	End Term Marks : 60
Internal Marks : 40	
Semester : VIII	Academic year : 2023-24
Lesson plan Author: Anil Kumar R	Date :10/03/2024

**Course Learning Objective:**

To impart knowledge of CIM and Automation and different concepts of automation by developing mathematical models.

To make students to understand the Computer Applications in Design and Manufacturing [CAD / CAM] leading to Computer integrated systems. Enable them to perform various transformations of entities on display devices.

To expose students to automated flow lines, assembly lines, Line Balancing Techniques, and Flexible Manufacturing Systems.

To expose students to computer aided process planning, material requirement planning, capacity planning etc.

To expose the students to CNC Machine Tools, CNC part programming, and industrial robots.

To introduce the students to concepts of Additive Manufacturing, Internet of Things, and Industry 4.0 leading to Smart Factory.

**Course Outcomes:**

CO1: Define Automation, CIM, CAD, CAM and explain the differences between these concepts. Solve simple problems of transformations of entities on computer screen

CO2: Explain the basics of automated manufacturing industries through mathematical models and analyze different types of automated flow lines.

CO3: Analyze the automated flow lines to reduce time and enhance productivity.

CO4: Explain the use of different computer applications in manufacturing, and able to prepare part programs for simple jobs on CNC machine tools and robot programming.

CO5: Visualize and appreciate the modern trends in Manufacturing like additive manufacturing, Industry 4.0 and applications of Internet of Things leading to Smart Manufacturing. Module-1



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Week	Days/ Date	Contents of Unit	Bloom's Taxonomy Level	Course Outcome (CO)
1	1	Introduction to CIM and Automation: Automation in Production Systems,	R,U	CO1
	2	automated manufacturing systems- types of automation, reasons for automating, Computer Integrated Manufacturing, computerized elements of a CIM system, CAD/CAM and CIM. Mathematical models and matrices:	R,U	CO1
	3	production rate, production capacity, utilization and availability, manufacturing lead time, work-in- process, numerical problems.	R,U	CO1,C02
2	1	Automated Production Lines and Assembly Systems: Fundamentals, system configurations, applications, automated flow lines, buffer storage, control of production line,	R,U	CO1,C02
	2	analysis of transfer lines, analysis of flow lines without storage, partial automation, analysis of automated flow lines with storage buffer, fundamentals of automated assembly systems, numerical.	A1,A2	CO1,C02

## Module-2

Week	Days/ Date	Contents of Unit	Bloom's Taxonomy Level	Course Outcome (CO)
2	3	CAD and Computer Graphics Software: The design process, applications of computers in design,	R,U	CO1
3	1	software configuration, functions of graphics package, constructing the geometry.	R,U	CO1
	2	Transformations: 2D transformations, translation, rotation and scaling, homogeneous transformation matrix, concatenation,	R,U	CO1



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	3	numerical problems on transformations	R,U	CO1
4	1	Biomass Energy: Photosynthesis, photosynthetic oxygen production, energy plantation.	R,U	CO1
	2	Bio Chemical Route: Biogas production from organic wastes by anaerobic fermentation,	R,U	CO1
	3	Bio gas plants-KVIC, Janta, Deenbandu models, factors affecting bio gas generation.	R,U	CO1
5	1	Thermal gasification of biomass, updraft and downdraft	R,U	CO1

### Module-3

Week	Days/ Date	Contents of Unit	Bloom's Taxonomy Level	Course Outcome (CO)
5	2	Geothermal Energy: Forms of geothermal energy, Dry steam, wet steam, hot dry rock and magmatic chamber systems.	R,U	CO1
	3	Tidal Energy: Tidal power, Site selection, Single basin and double basin systems,		
6	1	Advantages and disadvantages of tidal energy.	R,U	CO1
	2	Wind Energy: Wind energy-Advantages and limitations,	R,U	CO1
	3	wind velocity and wind power, Basic components of wind energy conversion systems,	R,U	CO1
7	1	horizontal and vertical axis wind mills,	R,U	CO1
	2	coefficient of performance of a wind mill rotor,	R,U	CO1
	3	Applications of wind energy.	R,U	CO1

### Module-4

Week	Days/ Date	Contents of Unit	Bloom's Taxonomy Level	Course Outcome (CO)
8	1	Computer Numerical Control: Introduction, components of CNC, CNC programming, manual part programming	R,U	CO1
	2	G Codes, M Codes,		



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	3	, programming of simple components in turning, programming with canned cycles. Cutter radius compensations.		
9	1	drilling and milling systems,	R,U	CO1
	2	spill way and draft tube and their applications, pumped storage plants	R,U	CO1
	3	Robot Technology: Robot anatomy, joints and links, common robot configurations,	R,U	CO1
10	1	robot control systems, accuracy and repeatability, end effectors, sensors in robotics. Robot programming methods	R,U	CO1
	2	on-line and off line methods. Robot industrial applications	R,U	CO1
	3	material handling, processing and assembly and inspection	R,U	CO1

## Module-5

Week	Days/Date	Contents of Unit	Bloom's Taxonomy Level	Course Outcome (CO)
11	1	Additive Manufacturing Systems: Basic principles of additive manufacturing, s	R,U	CO1
	2	licing CAD models for AM, advantages and limitations of AM technologies, Additive manufacturing processes:		
	3	Photo polymerization, material jetting, binder jetting, material extrusion,		
12	1	sheet lamination, direct energy deposition techniques, applications of AM	R,U	CO1
	2	Powder bed sintering techniques,	R,U	CO1
	3	Future of Automated Factory: Industry 4.0, functions, applications and benefits. Components of Industry 4.0,	R,U	CO1
13	1	Internet of Things (IOT), IOT applications in manufacturing, Big-Data and Cloud Computing for IOT,	R,U	CO1
	2	IOT for smart manufacturing, influence of IOT on predictive maintenance, industrial automation,	R,U	CO1
	3	supply chain optimization, supply-chain & logistics, cyber-physical manufacturing systems.	R,U	CO1



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Sl No	Title of the Book	Name of the Author/s	Name of the Publisher	Edition and Year
<b>Textbook/s</b>				
1	Automation, Production Systems and Computer-Integrated Manufacturing	Mikell P Groover	Pearson Learning.	4 <sup>th</sup> Edition, 2015
2	CAD / CAM Principles and Applications	P N Rao	Tata McGraw-Hill	3 <sup>rd</sup> Edition, 2015
3	CAD/CAM/CIM	Dr. P. Radhakrishnan	New Age International Publishers, New Delhi.	3 <sup>rd</sup> edition
<b>Reference Books</b>				
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7	Internet of Things: A Hands-on Approach"	ArshdeepBahga and Vijay Madiseti	Universities Press	
8	Additive Manufacturing Technologies: Rapid Prototyping to Direct Digital Manufacturing,	Ian Gibson, David W. Rosen, Brent Stucker		2nd Ed. (2015)
9	Understanding Additive Manufacturing	Andreas Gebhardt, Hanser Publishers		2011
10	Understanding Additive Manufacturing",	Andreas Gebhardt,	Hanser Publishers,	2011

  
Signature of Faculty

  
Signature of HOD



## CITY ENGINEERING COLLEGE

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Doddakallasandra, Off Kanakapura Main Road,  
Next to Gokulam Apartment, Bangalore - 560 062.



Q no.	Question Bank 1
1.	Explain main components of Internal Combustion Engines and their Functions.
2.	Briefly Explain. i) Fuel supply system ii) Cooling System
3.	List and explain Lubrication System.
4.	Explain Automatic Manual Transmission (AMT).
5.	Explain intelligent manual Transmission
6.	Explain Continuously Variable Transmission
7.	With a neat sketch, explain working of Hydraulic & Air suspension
8.	Explain the Functions & advantages of Leaf Spring, Coil Spring, Telescopic Shock Absorber.
9.	Explain Engine Management System.
10.	Write a short note on i) super charged engines ii) hybrid engines



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Q no.	Question Bank 2
1.	Explain the basic components of NC system with a block diagram.
2.	a) Describe Big Data and Cloud Computing. b) Discuss IOT applications in Manufacturing.
3.	With a neat sketch, explain Sheet Lamination process in Additive Manufacturing.
4.	Sketch and explain the common Robot Configurations.
5.	Explain the Retrieval CAPP system with a neat block diagram
6.	Explain the Retrieval CAPP system with a neat block diagram With a neat sketch explain Photo polymerization process in Additive Manufacturing.
7.	Discuss various methods used to program Robots to perform a given work cycle.
8.	Write the manual Part Programming for any Milling profile of your choice.
9.	Describe the coordinate systems used in CNC. Explain Absolute Programming and Incremental Programming with examples.
10.	Explain Industry 4.0 Application in Manufacturing.



USN

COURSE CODE: 18ME71

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*S. Karan*

**CITY ENGINEERING COLLEGE**  
**FIRST INTERNAL TEST**

PROGRAMME: MECHANICAL ENGINEERING

DATE: 15/11/2023

COURSE NAME: COMPUTER AIDED DESIGN &amp; MANUFACTURING

TIME: 02:30PM – 04:00PM

SEM: 7<sup>TH</sup> 'A'

Duration: 1.30 Hrs

MAX MARKS: 50

*Note: Answer any FIVE questions choosing at least one from each Part.*

Q no.	PART - A	M	CO'S	BT'S
1.	Define Automation. Explain the different types of Automation.	10	C01	BT2
<b>OR</b>				
2.	Explain the different configurations of Automated flow lines.	10	C01	BT2
<b>PART - B</b>				
3.	Explain the computerized elements of CIM system with a diagram.	10	C01	BT2
<b>OR</b>				
4.	The average part produced in certain manufacturing plant, must be processed through an average of 8 machines. 15 new batches are launched each week. Operating time is 8 mins, average set up time is 8 hrs; batch size is 30. Average non-operation time is 15 hrs/ machine. Number of machines available is 20. Plant operates for 80 production hrs/week. Determine. i) Manufacturing Lead Time ii) Production rate iii) Utilization iv) Work in process.	10	C02	BT2
<b>PART-C</b>				
5.	Explain the different Mathematical models in production system.	10	C01	BT2
<b>OR</b>				
6.	Define the Transfer Mechanism. With a neat sketch explain Geneva Mechanism and Walking beam Transfer Mechanism.	10	C03	BT2
<b>PART-D</b>				
7.	Write the purpose of buffer storage. Write the purpose of buffer storage. Mention three extreme cases of buffer effectiveness in automated flow lines.	10	C01	BT2
<b>OR</b>				
8.	State and explain the different steps in Computer Aided Design Process.	05	C03	BT2
<b>PART-E</b>				
9.	There are 24 machines in the manufacturing plant and the parts must be processed through an average of eight machines. 24 new batches are launched each week. Average operation time is 6 mins. Average batch size is 30 parts, average set up time is 6 hrs and average non operation time per batch is 12 hr/ machine. The plant operates an average of 80 production hours per week and assume A = 95%. Determine: i) Manufacturing Lead Time ii) Production rate iii) Plant Capacity iv) Plant utilization v) WIP vi) WIP ratio	10	C01	BT2
<b>OR</b>				
10.	Briefly explain the reasons for automating. Also explain the applications of Automation.	10	C03	BT2

**CITY ENGINEERING COLLEGE**  
**DEPARTMENT OF ...MECHANICAL...**

**SCHEME FOR VALUATION**

Semester & Section: 7<sup>th</sup> → 'A'      Internal Test I<sup>st</sup>

Date: 15/11/2023

Question No.	Details of the Answer	Marks Distribution	Total Marks
1]	Definition of Automation →	02	10
	Explanation of Different types of Automation →	08	
2]	Configuration of Automated (Explanation) of Flow lines →	05	10
	Diagram of Flow lines →	05	
4]	MLT = 270 hours.	2.5	10
	Production Rate = 76%.	2.5	
	Utilization = 92%.	2.5	
	Work in process = 213	2.5	
3]	Diagram of CIM. →	05	10
	Explanation of Computerized elements →	05	
5]	Explanation of Different Mathematical models →	10	10

A A  
Staff

S. Karthikeyan  
HOD

**CITY ENGINEERING COLLEGE**  
**DEPARTMENT OF MECHANICAL**

**SCHEME FOR VALUATION**

Semester & Section: 7<sup>th</sup> → 'A' Internal Test I<sup>st</sup>

Date: 15/11/2023

Question No.	Details of the Answer	Marks Distribution	Total Marks
6]	Definition of Transfer Mechanism Geneva Mechanism } Explanation } Sketch } Walking beam Transfer Mechanism } Explanation } Sketch }	02 2x2 2x2 2x2 2x2	10
7]	Purpose of Buffer Storage (3) Extreme cases of buffer (Description) effectiveness	01 (3x3)	10
8]	Different steps explanation for CAD Process	10	10
9]	MLT = 278 Production Rate = 72% Plant Capacity = 271	Utilization = 93% WIP = 208 WIP ratio = 4	10
10]	Reason for automation Applications of Automation	05 05	10

Staff

S. Kulkarni  
 HOD

USN

COURSE CODE: 18ME71

S. Kulkarni

**CITY ENGINEERING COLLEGE**  
**THIRD INTERNAL TEST**

PROGRAMME: MECHANICAL ENGINEERING  
COURSE NAME: COMPUTER AIDED DESIGN & MANUFACTURING  
SEM: 7<sup>TH</sup> 'A'  
Duration: 1.30 Hrs

DATE: 03/01/2024  
TIME: 02:30PM – 04:00PM

MAX MARKS: 50

*Note: Answer any FIVE questions choosing at least one from each Part.*

Q no.	PART - A	M	CO'S	BT'S
1.	Explain the basic components of NC system with a block diagram.	10	C04	BT2
OR				
2.	a) Describe Big Data and Cloud Computing. b) Discuss IOT applications in Manufacturing.	10	C04	BT2
PART - B				
3.	With a neat sketch, explain Sheet Lamination process in Additive Manufacturing.	10	C04	BT2
OR				
4.	Sketch and explain the common Robot Configurations.	10	C04	BT2
PART-C				
5.	Explain the Retrieval CAPP system with a neat block diagram	10	C04	BT2
OR				
6.	Explain the Retrieval CAPP system with a neat block diagram With a neat sketch explain Photo polymerization process in Additive Manufacturing.	10	C03	BT2
PART-D				
7.	Discuss various methods used to program Robots to perform a given work cycle.	10	C04	BT2
OR				
8.	Write the manual Part Programming for any Milling profile of your choice.	10	C03	BT2
PART-E				
9.	Describe the coordinate systems used in CNC. Explain Absolute Programming and Incremental Programming with examples.	10	C04	BT2
OR				
10.	Explain Industry 4.0 Application in Manufacturing.	10	C04	BT2

**CITY ENGINEERING COLLEGE**  
**DEPARTMENT OF ..Mechanical Engineering..**

**SCHEME FOR VALUATION**

Semester & Section: VII & A Internal Test III

Date: 03/01/2024

Question No.	Details of the Answer	Marks Distribution	Total Marks
1.	Block Diagram of CNC - OS, Explanation	10	10
2.	Big data & cloud computing IOT Application	05 } 05 }	10
3.	Sketch - Sheet lamination Explanation	05 } 05 }	10
4.	Cartesian, polar, cylindrical, spherical	4 x 2.5	10
5.	Block diagram Sketch Explanation	05 } 05 }	10
6.	photo polymerization Sketch - 05 Explanation - 05	10	10
7.	Explain Any two methods	02 x 5	10
8.	CNC programming for Milling	10	10
9.	Coordinate System in CNC Absolute programming, Incremental programming	02 } 04 } 04 }	10
10.	Application Industry 4.0 Application Any five	02 x 5	10

A.R

Stamman













# 18ME71- CADM

Date	Topics Planned
4/09/23	Automation in Production and automated manufacturing systems
5/09/23	types of automation, elements of a CIM system, CAD/CAM and CIM
18/09/23	Mathematical models and matrices
19/09/23	Automated Production Lines and Assembly Systems: Fundamentals
29/09/23	automated flow lines, buffer storage, control of production line
26/09/23	analysis of transfer lines, analysis of flow lines without storage
27/09/23	partial automation, analysis of automated flow lines with storage buffer
29/09/23	numericals
3/10/23	CAD and Computer Graphics Software: The design process, applications
4/10/23	functions of graphics package, constructing the geometry
5/10/23	Transformations: 2D transformations, translation, rotation and scaling
11/10/23	numerical problems on transformations
12/10/23	Computerized Manufacture Planning and Control System: Computer Aided Process Planning
18/10/23	Retrieval and Generative Systems, benefits of CAPP
19/10/23	Material Requirement Planning, inputs to MRP system, working of MRP
23/10/23	Capacity Planning, Computer Aided Quality Control,
25/10/23	Flexible Manufacturing Systems: Fundamentals of Group Technology
2/11/23	types of FMS, FMS components, Material handling and storage system
09/11/23	FMS planning and design issues, Automated Storage and Retrieval Systems
14/11/23	AS/RS and Automatic parts identification systems
15/11/23	Line Balancing: Line balancing algorithms, methods of line balancing
21/11/23	numerical problems on largest candidate rule, Kilbridge and Wester method,
29/11/23	Ranked Positional Weights method, Mixed Model line
23/11/23	Numericals
1/12/23	Computer Numerical Control: Introduction, components of CNC
7/12/23	CNC programming, manual part programming, G Codes, M Codes
8/12/23	programming of simple components in turning, drilling and milling
12/12/23	programming with canned cycles. Cutter radius compensations
13/12/23	Robot Technology: Robot anatomy, joints and links
14/12/23	Common robot configurations, robot control systems
15/12/23	Robot programming methods: on-line and offline
19/12/23	Robot industrial applications: material handling, processing and assembly
19/12/23	Additive Manufacturing Systems: Basic principles of additive manufacturing
20/12/23	slicing CAD models for AM. advantages and limitations
21/12/23	Additive manufacturing processes: Photo polymerization
21/12/23	Powder bed sintering techniques, sheet lamination
21/12/23	Future of Automated Factory: Industry 4.0, functions, applications and benefits
26/12/23	Components of Industry 4.0, Internet of Things (IOT), IOT applications
27/12/23	Big-Data and Cloud Computing for IOT, IOT for smart manufacturing
28/12/23	cyber-physical manufacturing systems

*A. R.*