CITY ENGINEERING COLLEGE

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

ACADEMIC YEAR: 2021-22

ODD SEMESTER

III Semester: 2021-2022 (ODD Sem)

Course Name: Transform Calculus, Fourier Series And Numerical Techniques
Course Code: 18MAT31/C301

Cos	Statements
C301.1	Use Laplace transform and inverse Laplace transform in solving differential/ integral equation arising in network analysis, control systems and other fields of engineering.
C301.2	Demonstrate Fourier series to study the behaviour of periodic functions and their applications in system communications, digital signal processing and field theory.
C301.3	Make use of Fourier transform and Z-transform to illustrate discrete/continuous function arising in wave and heat propagation, signals and systems.
C301.4	Solve first and second order ordinary differential equations arising in engineering problems using single step and multistep numerical methods.
C301.5	Determine the extremals of functionals using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis.

	PO1	PO 2	PO3	PO4	PO5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO1	3	2	1									1	3	2	
CO2	3	2	2									1	3	2	
CO3	3	2	2									1	3	2	
CO4	3	2	1									1	3	2	
CO5	3	2	1									1	3	2	
Avg	3	2	1.4									1	3	2	

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2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

ACADEMIC YEAR: 2021-22

ODD SEMESTER

III Semester2021-2022 (ODD Sem)

Course Name: Data Structures and Applications
Course Code: : 18CS32/C302

Cos	Statements
C302.1	Use different types of data structures, operations and algorithms
C302.2	Apply searching and sorting operations on files
C302.3	Use stack, Queue, Lists, Trees and Graphs in problem solving
C302.4	Implement all data structures in a high-level language for problem solving.
C302.5	Applying Basic file operations, hashing and indexing

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO 3
CO1	3	2											2	3	
CO2	2	1	3										2	3	
CO3		2	3										2	3	
CO4	1	2	3	1									2	3	
CO5	3	2	3										2	3	
Avg	2.2	1.8	3	1									2	3	

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2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

ACADEMIC YEAR: 2021-22

ODD SEMESTER

III Semester:2021-2022 (ODD Sem)

Course Name: Analog and Digital Electronics
Course Code: : 18CS33/C303

Cos	Statements
C303.1	Design and analyze application of analog circuits using photo devices, timer IC, power supply and regulator IC and op-amp.
C303.2	Explain the basic principles of A/D and D/A conversion circuits and develop the same.
C303.3	Simplify digital circuits using Karnaugh Map , and Quine-McClusky Methods
C303.4	Explain Gates and flip flops and make us in designing different data processing circuits, registers and counters and compare the types.
C302.5	Develop simple HDL programs

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO 3
CO1	1	2	3										3	2	
CO2	3	2	1										3	2	
CO3	1	2	3										3	2	
CO4	3	1	2										2	3	
CO5	1	1	3										2	3	
Avg	1.8	1.6	2.4										2.6	2.4	

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2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

ACADEMIC YEAR: 2021-22

ODD SEMESTER

III Semester: 2021-2022 (ODD Sem)

Course Name: Computer Organization
Course Code: 18CS34/C304

Cos	Statements
C304.1	Explain the basic organization of a computer system.
C304.2	Demonstrate functioning of different sub systems, such as processor, Input/output,and memory.
C304.3	Illustrate hardwired control and micro programmed control, pipelining, embedded and other computing systems.
C304.4	Design and analyse simple arithmetic and logical units.
C304.5	Describe the basic fundamentals of processing unit ad pipeling

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO1	3	1		2									3	2	
CO2	1	2	3	1									3	2	
CO3	2	2	3	2									2	3	
CO4	1	2	3	2									3	3	
CO5	3	2	1										3	2	
Avg	2	1.8	2.5	1.7									2.8	2.4	

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2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

ACADEMIC YEAR: 2021-22

ODD SEMESTER

III Semester:2021-2022 (ODD Sem)

Course Name: Software Engineering
Course Code: : 18CS35 /C305

Cos	Statements
C306.1	Design a software system, component, or process to meet desired needs within realistic constraints.
C306.2	Assess professional and ethical responsibility
C306.3	Function on multi-disciplinary teams
C306.4	Use the techniques, skills, and modern engineering tools necessary for engineering practice
C306.5	Analyze, design, implement, verify, validate, implement, apply, and maintain software systems or parts of software systems

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO1	1		3								2		3	2	
CO2	1	2	2					3			3		3	2	
CO3	2	1	1						2		2		3	2	
CO4	1	1	3		3						1		3	2	
CO5	1	2	3								3		3	2	
Avg	1.2	1.5	2.4		3			3	2		2.2		3	2	

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2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF ARTIFICIAL INTELLIGENCE & MACHINE LEARNING

ACADEMIC YEAR: 2021-22

ODD SEMESTER

III Semester: 2021-2022 (ODD Sem))

Course Name: Discrete Mathematical Structures
Course Code: : 18CS36 /C306

Cos	Statements
C307.1	Use propositional and predicate logic in knowledge representation and truth verification.
C307.2	Demonstrate the application of discrete structures in different fields of computer science.
C307.3	Solve problems using recurrence relations and generating functions.
C307.4	Application of different mathematical proofs techniques in proving theorems in the courses.
C307.5	Compare graphs, trees and their applications.

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO1	2	1	2	2									3	3	
CO2	1	1	1	2									2	3	
CO3	1	3	2	3									3	3	
CO4	2	2	3	2									2	3	
CO5	1	2		1									2	3	
Avg	1.4	1.8	2	2									2.4	3	

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DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2021-22

COURSE OUTCOMES (ODD)

7th Semester

COURSE NAME: QUALITY SURVEYING AND CONTRACT MANAGEMENT

COURSE CODE: 18CV71(C701)

COs	STATEMENTS
C701.1	Taking out quantities and work out the cost and preparation of abstract for the estimated cost for various civil engineering works.
C701.2	Prepare detailed and abstract estimates for various road works, structural works and water supply and sanitary works.
C701.3	Prepare the specifications and analyze the rates for various items of work
C701.4	Assess contract and tender documents for various construction works.
C701.5	Prepare valuation reports of buildings.

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DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2021-22

COURSE OUTCOMES (ODD)

7th Semester

COURSE NAME: DESIGN OF RCC AND STEEL STRUCTURES

COURSE CODE: 18CV72(C702)

COs	STATEMENTS
C702.1	Students will acquire the basic knowledge in design of RCC and Steel Structures.
C702.2	Students will have the ability to follow design procedures as per codal provisions and skills to arrive at structurally safe RC and Steel members.

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DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2021-22

COURSE OUTCOMES (ODD)

7th Semester

COURSE NAME: AIR POLLUTION AND CONTROL

COURSE CODE: 18CV732(C703)

COs	STATEMENTS
C703.1	Identify the major sources of air pollution and understand their effects on health and environment.
C703.2	Evaluate the dispersion of air pollutants in the atmosphere and to develop air quality models.
C703.3	Ascertain and evaluate sampling techniques for atmospheric and stack pollutants.
C703.4	Choose and design control techniques for particulate and gaseous emissions.

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DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2021-22

COURSE OUTCOMES (ODD)

7th Semester

COURSE NAME: URBAN TRANSPORT PLANNING

COURSE CODE: 18CV745(C704)

COs	STATEMENTS
C704.1	Design, conduct and administer surveys to provide the data required for transportation planning
C704.2	Supervise the process of data collection about travel behavior and analyze the data for use in transport planning.
C704.3	Develop and calibrate modal split, trip generation rates for specific types of land use developments.
C704.4	Adopt the steps that are necessary to complete a long-term transportation plan.

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DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2021-22

COURSE OUTCOMES (ODD)

7th Semester

COURSE NAME: ENERGY AND ENVIRONMENT

COURSE CODE: 18ME751 (C705)

COs	STATEMENTS
C705.1	Understand energy scenario, energy sources and their utilization.
C705.2	Understand various methods of energy storage, energy management and economic analysis.
C705.3	Analyse the awareness about environment and eco system.
C705.4	Understand the environment pollution along with social issues and acts.

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ACADEMIC YEAR 2021-22

COURSE OUTCOMES (ODD)

7th Semester

COURSE NAME: COMPUTER AIDED DETAILING OF STRUCTURES

COURSE CODE: 18CVL76 (C706)

COs	STATEMENTS
C706.1	Prepare detailed working drawings

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DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2021-22

COURSE OUTCOMES (ODD)

7th Semester

COURSE NAME: GEOTECHNICAL ENGINEERING LABORATORY

COURSE CODE: 18CVL77(C707)

COs	STATEMENTS
C707.1	Physical and index properties of the soil
C707.2	Classify based on index properties and field identification
C707.3	To determine OMC and MDD, plan and assess field compaction program
C707.4	Shearstrengthandconsolidationparameterstoassessstrengthanddeformationcharacteristics
C707.5	In-situ shear strength characteristics (SPT-Demonstration)

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DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2021-22

COURSE OUTCOMES (ODD)

5th Semester

COURSE NAME: CONSTRUCTION MANAGEMENT AND ENTREPRENEURSHIP

COURSE CODE: 18CV51 (C501)

COs	STATEMENTS
C501.1	Prepare a project plan based on requirements and prepare schedule of a project by understanding the activities and their sequence.
C501.2	Understand labour output, equipment efficiency to allocate resources required for an activity / project to achieve desired quality and safety.
C501.3	Analyze the economics of alternatives and evaluate benefits and profits of a construction activity based on monetary value and time value.
C501.4	Establish as an ethical entrepreneur and establish an enterprise utilizing the provisions offered by the federal agencies.

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ACADEMIC YEAR 2021-22

COURSE OUTCOMES (ODD)

5th Semester

COURSE NAME: ANALYSIS OF INDETERMINATE STRUCTURES

COURSE CODE: 18CV52 (C502)

COs	STATEMENTS
C502.1	Determine the moment in indeterminate beams and frames having variable moment of inertia and subsidence using slope defection method.
C502.2	Determine the moment in indeterminate beams and frames of no sway and sway using moment distribution method.
C502.3	Construct the bending moment diagram for beams and frames by Kani's method.
C502.4	Construct the bending moment diagram for beams and frames using flexibility method
C502.5	Analyze the beams and indeterminate frames by system stiffness method.

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ACADEMIC YEAR 2021-22

COURSE OUTCOMES (ODD)

5th Semester

COURSE NAME: DESIGN OF RC STRUCTURAL ELEMENTS

COURSE CODE: 18CV53 (C503)

COs	STATEMENTS
C503.1	Understand the design philosophy and principles.
C503.2	Solve engineering problems of RC elements subjected to flexure, shear and torsion.
C503.3	Demonstrate the procedural knowledge in designs of RC structural elements such as slabs, columns and footings.
C503.4	Owns professional and ethical responsibility.

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DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2021-22

COURSE OUTCOMES (ODD)

5th Semester

COURSE NAME: BASIC GEOTECHNICAL ENGINEERING
COURSE CODE: 18CV54 (C504)

COs	STATEMENTS
C504.1	Ability to plan and execute geotechnical site investigation program for different civil engineering projects
C504.2	Understanding of stress distribution and resulting settlement beneath the loaded footings on sand and clayey soils
C504.3	Ability to estimate factor of safety against failure of slopes and to compute lateral pressure distribution behind earth retaining structures
C504.4	Ability to determine bearing capacity of soil and achieve proficiency in proportioning shallow isolated and combined footings for uniform bearing pressure
C504.5	Capable of estimating load carrying capacity of single and group of piles

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DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2021-22

COURSE OUTCOMES (ODD)

5th Semester

COURSE NAME: MUNICIPAL WASTEWATER ENGINEERING
COURSE CODE: 18CV55 (C505)

COs	STATEMENTS
C505.1	Select the appropriate sewer appurtenances and materials in sewer network
C505.2	Design the sewers network and understand the self-purification process in flowing water.
C505.3	Design the varies physic- chemical treatment units
C505.4	Design the various biological treatment units
C505.5	Design various AOPs and low-cost treatment units.

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DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2021-22

COURSE OUTCOMES (ODD)

5th Semester

COURSE NAME: HIGHWAY ENGINEERING
COURSE CODE: 18CV56 (C506)

COs	STATEMENTS
C506.1	Acquire the capability of proposing a new alignment or re-alignment of existing roads, conduct necessary field investigation for generation of required data.
C506.2	Evaluate the engineering properties of the materials and suggest the suitability of the same for pavement construction.
C506.3	Design road geometrics, structural components of pavement and drainage.
C506.4	Evaluate the highway economics by few select methods and also will have a basic knowledge of various highway financing concepts.

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DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2021-22

COURSE OUTCOMES (ODD)

5th Semester

COURSE NAME: SURVEYING PRACTICE
COURSE CODE: 18CVL57 (C507)

COs	STATEMENTS
C507.1	Apply the basic principles of engineering surveying and for linear and angular measurements.
C507.2	Comprehendeffectivelyfieldproceduresrequiredforaprofessionalsurveyor.
C507.3	Use techniques, skills and conventional surveying instruments necessary f o reengineering practice.

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DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2021-22

COURSE OUTCOMES (ODD)

5th Semester

COURSE NAME: CONCRETE AND HIGHWAY MATERIALS LABORATORY
COURSE CODE: 18CVL58 (C508)

COs	STATEMENTS
C508.1	Able to interpret the experimental results of concrete and highway materials based on laboratory tests.
C508.2	Determine the quality and suitability of cement.
C508.3	Design appropriate concrete mix Using Professional codes.
C508.4	Determine strength and quality of concrete.
C508.5	Evaluate the strength of structural elements using NDT techniques.
C508.6	Test the soil for its suitability as sub grade soil for pavements.

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DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2021-22

COURSE OUTCOMES (ODD)

5th Semester

COURSE NAME: ENVIRONMENTAL STUDIES

COURSE CODE: 18CIV59 (C509)

COs	STATEMENTS
C509.1	Understand the principles of ecology and environmental issues that apply to air, land, and water issues on a global scale,
C509.2	Develop critical thinking and/or observation skills, and apply them to the analysis of a problem or question related to the environment.
C509.3	Demonstrate ecology knowledge of a complex relationship between biotic and a biotic component.
C509.4	Apply their ecological knowledge to illustrate and graph a problem and describe the realities that managers face when dealing with complex issues.

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Department of Computer Science and Engineering

2.6.1QlM Programme Outcomes (POs) and Course Outcomes (COs) offered by the department-
ODD Semester
Academic Year 2021-2022

SL NO	SEMESTER	SUBJECT/SUBJECT CODE
1	3	Transform Calculus, Fourier Series And Numerical Techniques (18MAT31)
2		Data Structures and Applications (18CS32)
3		Analog and Digital Electronics (18CS33)
4		Computer Organization (18CS34)
5		Software Engineering(18CS35)
6		Discrete Mathematical Structures(18CS36)
7		Analog and Digital Electronics Laboratory(18CSL37)
8		Data Structures Laboratory(18CSL38)
9	5	Management, Entrepreneurship for IT industry(18CS51)
10		Computer Networks and Security(18CS52)
11		Database Management Systems(18CS53)
12		Automata theory and Computability(18CS54)
13		Application Development using Python(18CS55)
14		Unix Programming (18CS56)
15		Computer Networks Laboratory (18CSL57)
16		DBMS Laboratory with Mini Project(18CSL58)
17	7	Artificial Intelligence & Machine Learning(18CS71)
18		Big Data Analytics(18CS72)
19		User Interface Design(18CS734)
20		Network Management(18CS742)
21		Energy & Environment(18ME751)
22		Artificial Intelligence & Machine Learning Lab(18CSL76)

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2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR: 2021-22

ODD SEMESTER-III

Course Name: Transform Calculus, Fourier Series And Numerical Techniques Course Code: 18MAT31/C301

Cos	Statements
C301.1	Use Laplace transform and inverse Laplace transform in solving differential/ integral equation arising in network analysis, control systems and other fields of engineering.
C301.2	Demonstrate Fourier series to study the behaviour of periodic functions and their applications in system communications, digital signal processing and field theory.
C301.3	Make use of Fourier transform and Z-transform to illustrate discrete/continuous function arising in wave and heat propagation, signals and systems.
C301.4	Solve first and second order ordinary differential equations arising in engineering problems using single step and multistep numerical methods.
C301.5	Determine the externals of functionals using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis.

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	1	1	1							1	1	1	1
CO2	2	2	1	1	1				2	1		2	1	1	3
CO3	3	3	3	1	1					1		2	2	2	2
CO4	3	3	3	3	1	1		1	1	3		2	3	1	1
CO5	2	3	3	1	2					1		3	2	1	2
AVG	2.6	2.4	2.2	1.4	1.2	1	0	1	1.5	1.5	0	2	1.8	1.2	1.8

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2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR: 2021-22

ODD SEMESTER-III

Course Name: Data Structures and Applications **Course Code: 18CS32 /C302**

Cos	Statements
C302.1	Use different types of data structures, operations and algorithms
C302.2	Apply searching and sorting operations on files
C302.3	Use stack, Queue, Lists, Trees and Graphs in problem solving
C302.4	Implement all data structures in a high-level language for problem solving.
C302.5	Implement all data structures in a high-level language for problem solving.

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	1	1	1							1	1	1	3
CO2	2	3	1	1	1							1	1	2	2
CO3	2	2	1	2	1							1	1	1	2
CO4	1	3	2	1	1							1	1	1	1
CO5	3	2	2	1	1							1	1	1	3
AVG	2.2	2.2	1.4	1.2	1	0	0	0	0	0	0	1	1	1.2	2.2

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2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR: 2021-22

ODD SEMESTER-III

Course Name: Analog and Digital Electronics **Course Code: 18CS33 /C303**

Cos	Statements
C303.1	Design and analyze application of analog circuits using photo devices, timer IC, power supply and regulator IC and op-amp.
C303.2	Explain the basic principles of A/D and D/A conversion circuits and develop the same.
C303.3	Simplify digital circuits using Karnaugh Map , and Quine-McClusky Methods
C303.4	Explain Gates and flip flops and make us in designing different data processing circuits, registers and counters and compare the types.
C303.5	Develop simple HDL programs

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	2	1	1							3	1	1	3
CO2	1	1	2	1	1							2	1	2	2
CO3	1	1	2	1	1							2	1	1	2
CO4	1	1	1	1	1							2	1	2	1
CO5	1	1	1	2	1							3	1	2	3
AVG	1	1	1.6	1.2	1	0	0	0	0	0	0	2.4	1	1.6	2.2

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2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR: 2021-22

ODD SEMESTER-III

Course Name: Computer Organization **Course Code: 18CS34 /C304**

Cos	Statements
C304.1	Explain the basic organization of a computer system.
C304.2	Demonstrate functioning of different sub systems, such as processor, Input/output,and memory.
C304.3	Illustrate hardwired control and micro programmed control, pipelining, embedded and other computing systems.
C304.4	Illustrate hardwired control and micro programmed control, pipelining, embedded and other computing systems.
C304.5	Design and analyse simple arithmetic and logical units.

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	1	1	1	1							1	2	1
CO2	3	1	1	1								2	2	1	2
CO3	3	3	3	3	1								3	3	3
CO4	1	3	3	1	1								2	2	2
CO5	3	3	3	1	3	3						1	3	3	3
AVG	2.6	2.2	2.2	1.4	1.5	2	0	0	0	0	0	1.5	2.2	2.2	2.2

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR: 2021-22

ODD SEMESTER-III

Course Name: Software Engineering **Course Code: 18CS35/C305**

Cos	Statements
C305.1	Design a software system, component, or process to meet desired needs within realistic constraints.
C305.2	Assess professional and ethical responsibility
C305.3	Function on multi-disciplinary teams
C305.4	Use the techniques, skills, and modern engineering tools necessary for engineering practice
C305.5	Analyze, design, implement, verify, validate, implement, apply, and maintain software systems or parts of software systems

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	1	1	1								1	1	1
CO2	2	2	1	1	1								1	1	1
CO3	3	3	1	1	1								1	2	2
CO4	3	3	1	1	1								1	1	1
CO5	2	3	1	1	1								1	1	2
AVG	2.6	2.4	1	1	1	0	0	0	0	0	0	0	1	1.2	1.2

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2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR: 2021-22

ODD SEMESTER-III

Course Name: Discrete Mathematical Structures **Course Code:18CS36/C306**

Cos	Statements
C306.1	Use propositional and predicate logic in knowledge representation and truth verification.
C306.2	Demonstrate the application of discrete structures in different fields of computer science.
C306.3	Solve problems using recurrence relations and generating functions.
C306.4	Application of different mathematical proofs techniques in proving theorems in thecourses.
C306.5	Compare graphs, trees and their applications

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	1	1	1							1	1	1	1
CO2	2	2	1	1	1				2	1		2	1	1	3
CO3	3	3	3	1	1					1		2	2	2	2
CO4	3	3	3	3	1	1		1	1	3		2	3	1	1
CO5	2	3	3	1	2					1		3	2	1	2
AVG	2.6	2.4	2.2	1.4	1.2	1	0	1	1.5	1.5	0	2	1.8	1.2	1.8

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2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR: 2021-22

ODD SEMESTER-III

Course Name: Analog and Digital Electronics Laboratory **Course Code:18CSL37/C306**

Cos	Statements
C306.1	Analog components and circuits including Operational Amplifier, Timer, etc.
C306.2	Combinational logic circuits.
C306.3	Flip - Flops and their operations
C306.4	Counters and registers using flip-flops. .
C306.5	Synchronous and Asynchronous sequential circuits.

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR: 2021-22

ODD SEMESTER-III

Course Name: Data Structures Laboratory **Course Code:18CSL38/C306**

Cos	Statements
C306.1	Asymptotic performance of algorithms.
C306.2	Linear data structures and their applications such as stacks, queues and lists
C306.3	Flip - Flops and their operations
C306.4	Non-Linear data structures and their applications such as trees and graphs
C306.5	Sorting and searching algorithms .

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR: 2021-22

ODD SEMESTER-V

Course Name: Management, Entrepreneurship for IT industry **Course Code: 18CS51/C501**

Cos	Statements
C5O1.1	Define management, organization, entrepreneur, planning, staffing, ERP and outline their importance in entrepreneurship
C5O1.2	Utilize the resources available effectively through ERP .
C5O1.3	Define management, organization, entrepreneur, planning, staffing, ERP and outline their importance in entrepreneurship
C5O1.4	Make use of IPRs and institutional support in entrepreneurship
C5O1.5	Discuss on planning, staffing, ERP and their importance

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	1	1	1								1	1	1
CO2	2	2	1	1	1								1	1	1
CO3	3	3	1	1	1								1	2	2
CO4	3	3	1	1	1								1	1	1
CO5	2	3	1	1	1								1	1	2
AVG	2.6	2.4	1	1	1	0	0	0	0	0	0	0	1	1.2	1.2

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2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR: 2021-22

ODD SEMESTER-V

Course Name: Computer Networks and Security **Course Code: 18CS52/C502**

Cos	Statements
C5O2.1	Explain principles of application layer protocols
C5O2.2	Recognize transport layer services and infer UDP and TCP protocols
C5O2.3	Classify routers, IP and Routing Algorithms in network layer
C5O2.4	Understand the Wireless and Mobile Networks covering IEEE 802.11 Standard
C502.5	Describe Multimedia Networking and Network Management

CO PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	1	2	1	1						1	3	2	1
CO2	3	3	1	2	2							2	1	1	2
CO3	3	3	3	2	1							2	3	3	3
CO4	1	3	3	1	1							2	2	2	2
CO5	3	3	3	1	3	3						1	3	3	3
AVG	2.6	3	2.2	1.6	1.6	2	0	0	0	0	0	1.6	2.4	2.2	2.2

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR: 2021-22

ODD SEMESTER-V

Course Name: DATABASE MANAGEMENT SYSTEMS **Course Code: 18CS53/C503**

Cos	Statements
C503.1	Identify, analyze and define database objects, enforce integrity constraints on a database using RDBMS.
C503.2	Use Structured Query Language (SQL) for database manipulation and also demonstrate the basic of query evaluation.
C503.3	Use Structured Query Language (SQL) for database manipulation.
C503.4	Design and build simple database systems
C503.5	Develop application to interact with databases.

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	33	3	1										1	1	1
CO2	2	3	1							1		1	1	1	2
CO3	2	2	3	2	2						1	1	2	2	2
CO4	2	2	3	2						1	1	1	2	2	2
CO5	2	2	2											1	1
AVG	8.2	2.4	2	2	2	0	0	0	0	1	1	1	1.5	1.4	1.6

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR: 2021-22

ODD SEMESTER-V

Course Name: Automata theory and Computability **Course Code: 18CS54/C504**

Cos	Statements
C5O4.1	Acquire fundamental understanding of the core concepts in automata theory and Theory of Computation.
C5O4.2	Design and develop lexical analysers, parsers and code generators.
C5O4.3	Design Grammars and Automata (recognizers) for different language classes and become knowledgeable about restricted models of Computation (Regular, Context Free) and their relative powers.
C5O4.4	Acquire fundamental understanding of the structure of a Compiler and Apply concepts automata theory and Theory of Computation to design Compilers.
C5O4.5	Classify a problem with respect to different models of Computation.

CO PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	1	3	1								1	1	1
CO2	2	2	1	2	1								1	1	3
CO3	3	3	3	3	1								2	2	2
CO4	3	3	3	2	1								3	1	1
CO5	2	3	3	3	2								2	1	2
AVG	2.6	2.4	2.2	2.6	1.2	0	0	0	0	0	0	0	1.8	1.2	1.8

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR: 2021-22

ODD SEMESTER-V

Course Name: Application Development using Python **Course Code: 18CS55/C505**

Cos	Statements
C5O5.1	Demonstrate proficiency in handling of loops and creation of functions.
C5O5.2	Identify the methods to create and manipulate lists, tuples and dictionaries.
C5O5.3	Discover the commonly used operations involving regular expressions and file system.
C5O5.4	Interpret the concepts of Object-Oriented Programming as used in Python.
C5O5.5	Determine the need for scraping websites and working with CSV, JSON and other file formats.

CO PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	1	1	1								1	1	2
CO2	3	2	1	1	1								1	1	2
CO3	3	2	3	1	1								2	2	2
CO4	3	2	3	1	1								1	1	2
CO5	3	2	3	1	2								1	1	2
AVG	3	2	2.2	1	1.2	0	0	0	0	0	0	0	1.2	1.2	2

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR: 2021-22

ODD SEMESTER-V

Course Name: Unix Programming **Course Code: 18CS56/C506**

Cos	Statements
C5O6.1	Explain Unix Architecture, File system and use of Basic Commands
C5O6.2	Illustrate Shell Programming and to write Shell Scripts
C5O6.3	Illustrate Shell Programming and to write Shell Scripts
C5O6.4	Categorize, compare and make use of Unix System Calls
C5O6.5	Build an application/service over a Unix system.

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	33	3	1										1	1	1
CO2	2	3	1							1		1	1	1	2
CO3	2	2	3	2	2						1	1	2	2	2
CO4	2	2	3	2						1	1	1	2	2	2
CO5	2	2	2											1	1
AVG	8.2	2.4	2	2	2	0	0	0	0	1	1	1	1.5	1.4	1.6

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR: 2021-22

ODD SEMESTER-V

Course Name: COMPUTER NETWORKS LABORATORY **Course Code:18CSL57/C507**

Cos	Statements
C507.1	Demonstrate operation of network and its management commands
C507.2	Simulate and demonstrate the performance of GSM and CDMA
C507.3	Implement data link layer and transport layer protocols.
C507.4	Demonstrate the working of different concepts of networking.
C507.5	Implement, analyze and evaluate networking protocols in NS2 / NS3 and JAVA programming language

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR: 2021-22

ODD SEMESTER-V

Course Name: DBMS LABORATORY WITH MINI PROJECT **Course Code:18CSL58/C507**

Cos	Statements
C508.1	Foundation knowledge in database concepts, technology and practice to groom students into well-informed database application developers
C508.2	Strong practice in SQL programming through a variety of database problems.
C508.3	Develop database applications using front-end tools and back-end DBMS.
C508.4	Demonstrate the working of different concepts of DBMS
C508.5	Implement, analyze and evaluate the project developed for an application.

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR: 2021-22

ODD SEMESTER-VII

Course Name: Artificial Intelligence & Machine Learning **Course Code: 18CS71/C701**

Cos	Statements
C7O1.1	Appaise the theory of Artificial intelligence and Machine Learning.
C7O1.2	Explain theory of probability and statistics related to machine learning
C7O1.3	Investigate concept learning, ANN, Bayes classifier, k nearest neighbor, Q,
C7O1.4	Develop Kernel Methods with Dual Representations, Radial Basis and Function Networks
C7O1.5	Analyse implementation of Maximum Margin Classifiers and Relevance Vector Machines

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	1									1	1	1	1
CO2	2	2	1	1	1				2	1		2	1	1	3
CO3	3	3	3	1	1					1		2	2	2	2
CO4	3	3	3	3	1	1		1	1	3		2	3	1	1
CO5	2	3	3	1	2					1		3	2	1	2
AVG	2.6	2.4	2.2	1.5	1.2	1	0	1	1.5	1.5	0	2	1.8	1.2	1.8

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR: 2021-22

ODD SEMESTER-VII

Course Name: Big Data Analytics **Course Code: 18CS72/C702**

Cos	Statements
C7O2.1	Understand fundamentals of Big Data analytics.
C7O2.2	Investigate Hadoop framework and Hadoop Distributed File system.
C7O2.3	Illustrate the concepts of NoSQL using MongoDB and Cassandra for Big Data.
C7O2.4	Demonstrate the MapReduce programming model to process the big data along with Hadoop tools.
C7O2.5	Use Machine Learning algorithms for real world big data. Analyze web contents and Social Networks to provide analytics with relevant visualization tools.

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	1		1	1							3	2	1
CO2	3	1	1									2	1	1	2
CO3	3	3	3	3	1								3	3	3
CO4	1	3	3	1	1								2	2	2
CO5	3	3	3	1	3	3						1	3	3	3
AVG	2.6	2.2	2.2	1.6	1.5	2	0	0	0	0	0	1.5	2.4	2.2	2.2

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR: 2021-22

ODD SEMESTER-VII

Course Name: USER INTERFACE DESIGN **Course Code: 18CS734/C703**

Cos	Statements
C7O3.1	To study the concept of menus, windows, interfaces
C7O3.2	To study about business functions
C7O3.3	To study the characteristics and components of windows and the various controls For the windows.
C7O3.4	To study about various problems in windows design with color, text, graphics.
C7O3.5	To study the testing methods

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	1	1	1							1	1	1	3
CO2	1	3	1	1	1							1	1	2	2
CO3	2	2	1	2	1							1	1	1	2
CO4	1	3		1	1							1	1	1	1
CO5	1	2		1	1							1	1	1	3
AVG	1.2	2.2	1	1.2	1	0	0	0	0	0	0	1	1	1.2	2.2

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR: 2021-22

ODD SEMESTER-VII

Course Name: Network Management **Course Code: 18CS742/C704**

Cos	Statements
C7O4.1	Analyze the issues and challenges pertaining to management of emerging network technologies such as wired/wireless networks and high-speed internets.
C7O4.2	Apply network management standards to manage practical networks
C7O4.3	Formulate possible approaches for managing OSI network model.
C7O4.4	Use on SNMP for managing the network. Use RMON for monitoring the behavior of the network
C7O4.5	Identify the various components of network and formulate the scheme for the managing them

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1			2	1	3	1				3	1	1	3
CO2	1	1			2	1	3	1		1		2	1	2	2
CO3	1	1			2	1	3	1		1		2	1	1	2
CO4	1	1			1	1	3			1		2	1	2	1
CO5	1	1			1	2	2	1				3	1	2	3
AVG	1	1	0	0	1.6	1.2	2.8	1	0	1	0	2.4	1	1.6	2.2

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR: 2021-22

ODD SEMESTER-VII

Course Name: Energy & Environment **Course Code: 18ME751/C705**

Cos	Statements
C7O5.1	Understand energy scenario, energy sources and their utilization.
C7O5.2	Understand various methods of energy storage, energy management and economic analysis.
C7O5.3	Analyse the awareness about environment and eco system.
C7O5.4	Understand the environment pollution along with social issues and acts

CO-PO MAPPING

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1			2	1	3	1				3	1	1	3
CO2	1	1			2	1	3	1		1		2	1	2	2
CO3	1	1			2	1	3	1		1		2	1	1	2
CO4	1	1			1	1	3			1		2	1	2	1
CO5	1	1			1	2	2	1				3	1	2	3
AVG	1	1	0	0	1.6	1.2	2.8	1	0	1	0	2.4	1	1.6	2.2

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR: 2021-22

ODD SEMESTER-VII

Course Name: Artificial Intelligence & Machine Learning Lab **Course Code: 18CSL76/C706**

Cos	Statements
C7O6.1	Implement and demonstrate AI and ML algorithms.
C7O6.2	Design Java/Python programs for various Learning algorithms.
C7O6.3	Apply appropriate data sets to the Machine Learning algorithms.
C7O6.4	Apply Classification, Clustering and regression algorithm on the data set.
C7O6.5	Identify and apply Machine Learning algorithms to solve real world problems.

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ACADEMIC YEAR: 2021-22

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ODD SEMESTER - III

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

Course Name : Transform Calculus, Fourier Series and Numerical Techniques
Course Code : 18EC31

Cos	Statements
C301.1	Use Laplace transform and inverse Laplace transform in solving differential/ integral equation arising in network analysis, control systems and other fields of engineering
C301.2	Demonstrate Fourier series to study the behaviour of periodic functions and their applications in system communications, digital signal processing and field theory.
C301.3	Make use of Fourier transform and Z-transform to illustrate discrete/ continuous function arising in wave and heat propagation, signals and systems.
C301.4	Solve first and second order ordinary differential equations arising in engineering problems using single step and multistep numerical methods.
C306.6	Determine the extremals of functionals using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis

Co-Po Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
CO1	2	2	2	2		2							2	
CO2	2	2	2	2		2							2	
CO3	2	1	1	1		1								
CO4	1			1										
CO5	1	1		1									1	
AVERAGE	1.6	1.2	1	1.4		1							1	

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ODD SEMESTER - III

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

Course Name :Network Analysis
Course Code : 18EC32

Cos	Statements
C305.1	Determine currents and voltages using source transformation/ source shifting/ mesh/ nodal analysis and reduce given network using star- delta transformation/source transformation/ source shifting.
C305.2	Solve network problems by applying Superposition/ Thevenin's Norton's! Maximum Power Transfer/ Millman's Network Theorems and electrical laws to reduce circuit complexities and to arrive at feasible solutions
C305.3	Calculate current and voltages for the given circuit under transient conditions and Apply Laplace transform to solve the given network.
C305.4	Maximum Power Transfer/ Millman's Network Theorems and electrical laws to reduce circuit complexities and to arrive at feasible solutions.
C305.5	Understand the concept of resonance and determine the parameters that characterize series/parallel Resonant Circuits.

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2		2									1	
CO2	1	1		1									1	
CO3	1			1		1							1	
CO4													1	
C05	1	1	1										1	
AVERAGE	1	0.8	1	0.8		1							1	

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ODD SEMESTER - III

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

Course Name :Electronic Devices
Course Code : 18EC33

Cos	Statements
C305.1	Understand the principles of semiconductor Physics
C305.2	Understand the principles and characteristics of different types of semiconductor devices
C305.3	Understand the fabrication process of semiconductor devices
C305.4	Utilize the mathematical models of semiconductor junctions for circuits and systems
C305.5	Utilize the mathematical models of semiconductor junctions for circuits and systems

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	1		1		1								1
CO2	1	1		1										
CO3	1	1		1										
CO4	1	1		1										1
CO5	1	1		1										
AVERAGE	1	1		1		1								1

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ODD SEMESTER - III

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

Course Name :Digital System Design
Course Code : 18EC34

Cos	Statements
C305.1	Explain the concept of combinational and sequential logic circuits.
C305.2	Analyze and design the combinational logic circuits
C305.3	Describe and characterize flip-flops and its applications.
C305.4	Design the sequential circuits using SR, JK, D, T flip-flops and Mealy& Moore machines
C305.5	Design applications of Combinational & Sequential Circuits

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	1	1										1	
CO2	1												1	
CO3	1			1									1	
CO4	1			1									1	
CO5	1			1									1	
AVERAGE	1.2	1	1	0.6									1	

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ODD SEMESTER - III

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

Course Name : Computer Organization an Architecture
Course Code : 18EC35

Cos	Statements
C305.1	Explain the basic organization of a computer system.
C305.2	Describe the addressing modes, instruction formats and program control statement
C305.3	Explain different ways of accessing an input I output device including interrupts.
C305.4	Illustrate the organization of different types of semiconductor and other secondary storage memories
C305.5	Illustrate simple processor organization based on hardwired control and micro programmed control

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	1				1							1	
CO2	2												2	
CO3	1												1	
CO4	1					1							1	
CO5	1													
AVERAGE	1.4	1				1							1	

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ODD SEMESTER - III

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

Course Name : Power Electronics and Instrumentation
Course Code : 18EC36

Cos	Statements
C306.1	Build and test circuits using power electronic devices.
C306.2	Analyse and design-controlled rectifier, DC to DC converters, DC Toa inverters and SMPS.
C306.3	Analyze instrument characteristics and errors.
C306.4	Describe the principle of operation and develop circuits for multirange Ammeters, Voltmeters and Bridges to measure passive component values and frequency
C306.5	Explain the principle, design and analyze the transducers for measuring

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2												2	
CO2	1					1							1	
CO3	1			1		1								
CO4	1													
CO5				1		1								
AVERAGE	1			0.4		0.6								

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ODD SEMESTER - III

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

Course Name : Electronic Devices and Instrumentation Laboratory
Course Code : 18ECL37

Cos	Statements
C305.1	Understand the circuit schematic and its working.
C305.2	Study the characteristics of different electronic devices
C305.3	Design and test simple electronic circuits as per the specifications using discrete electronic components
C305.4	Familiarize with EDA software which can be used for electronic circuit

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2			1		2							2	
CO2	2			1		1								
CO3													2	
CO4	2			2		1								
AVERAGE	2			1									1	

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ODD SEMESTER - III

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

Course Name : Digital System Design Laboratory
Course Code : 18ECL38

Cos	Statements
C305.1	.Design, realize and verity De Morgan's Theorem, SOP, POS forms
C305.2	Demonstrate the truth table of various expressions and combinational circuits using logic gates
C305.3	Design various combinational circuits such as adders, subtractors, comparators, multiplexers and demultiplexers
C305.4	Construct flips-flops, counters and shift registers
C305.5	Simulate Serial adder and Binary Multiplier

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1			1		1							1	
CO2	1													
CO3	1			1		1							1	
CO4	1													
CO5	1		1											
AVERAGE	1		1	2		2								

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ODD SEMESTER - III

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

Course Name : Constitution of India and Cyber Law
Course Code : 18CPC39/49

Cos	Statements
C505.1	Describe and analyze the role and salient features of the Indian Constitution.
C505.2	Understand the structure and powers of the Union and State Executives.
C505.3	Relate to the procedures and provisions in the electoral process.
C505.4	Develop Engineering and Professional ethics and adopt the responsibilities expected of an Engineer
C505.5	Identify the cybercrimes and describe the cyber laws for cyber safety measures.

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1					1	1	1		1	1	1	1		1
CO2														1
CO3							1	1	1					1
CO4							1		1					1
CO5					1									1
AVERAGE					0.4	1	0.6	1	0.6	1	1	1		1

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ODD SEMESTER - V

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

Course Name : Technological Innovation Management Entrepreneurship
Course Code : 18ES51

Cos	Statements
C505.1	UnderstandthefundamentalconceptsofManagementandEntrepreneurshipandopportunitiesinordertosetupabusiness
C505.2	Identify the various organizations' architecture
C505.3	Describe the functions of Managers, Entrepreneurs and their social responsibilities
C505.4	Understand the components in developing a business plan
C505.5	Recognize the various sources of funding and institutions supporting entrepreneurs

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1					1	1								
CO2				1	1	1								
CO3			1	1		1								
CO4						1								
CO5					1	1			1		1	1		
AVERAGE			1	0.4	0.6	1			1		1	1		

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ODD SEMESTER - V

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

Course Name : Digital Signal Processing
Course Code : 18EC52

Cos	Statements
C505.1	Determine response of LTI systems using time domain and DFT techniques
C505.2	Compute DFT of real and complex discrete time signals
C505.3	Compute DFT using FFT algorithms and linear filtering approach
C505.4	Design and realize FIR and IIR digital filters
C505.5	Understand the DSP processor architecture.

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	1	2	1									2	
CO2	2	2	1	1									1	
CO3	2	2	1	1									1	
CO4	2	1	1	1									1	
CO5	1	1	1	1									1	
AVERAGE	1.8													

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ODD SEMESTER - V

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

Course Name : Principals of Communication systems
Course Code : 18EC53

Cos	Statements
C505.1	Analyze and compute performance of AM and FM modulation in the presence of noise at the receiver
C505.2	Analyse and compute performance of digital for matting processes
C505.3	With quantization noise
C505.4	Multiplex digitally form at ted signals at Transmitter
C505.5	De multiplex the signals and reconstruct digitally for matted signals at the receiver

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	1	1	1									2	
CO2	1	1	1	1									1	
CO3	1	1	1	2									1	
CO4	2	1	1	1									1	
CO4	1	1	1	1									1	
CO5	1.4	1	1	1.2									1.2	
AVERAGE	2	1	1	1									2	

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ODD SEMESTER - V

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

Course Name : Information theory and Coding
Course Code : 18EC54

Cos	Statements
C505.1	Explain concept of Dependent & Independent Source, measure of information, Entropy, Rate in formation and Order of a source
C505.2	Represent the information using Shannon Encoding, Shannon Fano, Prefix and Huffman Encoding Algorithms
C505.3	Model the continuous and discrete communication channels using input, output and joint probabilities
C505.4	Determine a code word comprising of the check bits computed using Linear Block codes, cyclic codes & convolutional codes
C505.5	Design the encoding and decoding circuits for Linear Block codes, cyclic codes, convolutional codes, BCH and Golay codes.

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	1	2	1									1	
CO2	1	1	1	1									1	
CO3	2	1	1	1									1	
CO4	1	2	1	1									1	
CO4	1	2	1	1									1	
CO5	1.4	1.4	1.2	1									1	
AVERAGE	2	1	2	1									1	

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ODD SEMESTER - V

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

Course Name : Electromagnetic Waves
Course Code : 18EC55

Cos	Statements
C505.1	Evaluate problems on electrostatic force, electric field due to point, linear, volume charges by applying conventional methods and charge in a volume.
C505.2	Apply Gauss law to evaluate Electric fields due to different charge distributions and Volume Charge distribution by using Divergence Theorem
C505.3	Determine potential and energy with respect to point charge and capacitance using Laplace equation and Apply Biot-Savart's and Ampere's laws for evaluating Magnetic field for different current configurations
C505.4	Calculate magnetic force, potential energy and Magnetization with
C505.5	Respect to magnetic materials and voltage induced in electric circuits

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	1	1	1									2	
CO2	2	2	1	1									1	
CO3	2	1	1	1									1	
CO4	2	1	1	1									1	
CO4	1	1	1	1									1	
CO5	1.8	1.2	1	1									1.2	
AVERAGE	2	1	1	1									2	

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ODD SEMESTER - V

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

Course Name : Verilog HDL
Course Code : 18EC56

Cos	Statements
C505.1	Write Verilog programs in gate, data flow(RTL),behavioral and switch modeling levels of Abstraction
C505.2	Design and verify the functionality of digital circuit/system using test
C505.3	Benches
C505.4	Design and verify the functionality of digital circuit/system using test
C505.5	Benches

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	1	1	1									1	
CO2	1	1	1	1									2	
CO3	1	1	1	1									2	
CO4	1	1	1	1									1	
CO4	1	1	1	1									1	
CO5	1	1	1	1									1	
AVERAGE	1	1	1	1									1.6	

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ODD SEMESTER - V

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

Course Name : Digital Signal Processing
Course Code : 18ECL57

Cos	Statements
C505.1	Understand the concepts of analog to digital conversion of signals and frequency domain sampling of signals
C505.2	Model the discrete time signals and systems and verify its properties and results
C505.3	Implement discrete computations using DSP processor and verify
C505.4	The results
C505.5	Realize the digital filters using a simulation tool and analyse the response of the filter for an audio signal

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	1	1	2									2	
CO2	2	1	1	1									1	
CO3	2	1	1	1									2	
CO4	2	1	1	1									1	
CO5	1	1	1	1									1	
AVERAGE	1	1	1	1									2	

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ODD SEMESTER - V

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

Course Name : HDL Laboratory
Course Code : 18ECL58

Cos	Statements
C505.1	Write the Verilog/VIIDL programs to simulate Combinational circuits in Dataflow, Behavioural and Gate level Abstractions.
C505.2	Describe sequential circuits like flip flops and counters in Behavioural description and obtain simulation waveforms.
C505.3	Use FPGA/CPLD kits for down loading Verilog codes and check output
C505.4	Synthesize Combinational and Sequential circuits on programmable ICs and test the hardware.
C505.5	Interface the hardware to the programmable chips and obtain the required output

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	1	1	2	1								2	
CO2	2	1	1	1	1								2	
CO3	2	1	1	1	1								2	
CO4		1		1	1								2	
CO4	1	1	1	1									1	
CO5	2	1	1	2	1	1							1	
AVERAGE	1.8	1	1	1.6	1	1							2.0	

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ODD SEMESTER - V

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

Course Name : Environmental Studies
Course Code : 18CIV59

Cos	Statements
C705.1	Understand the principles of ecology and environmental issues that apply to air, land, and water issues on a global scale,
C705.2	Develop critical thinking and/or observation skills, and apply them to the analysis of a problem or question related to the environment.
C705.3	Demonstrate ecology knowledge of a complex relationship between biotic and abiotic components
C705.4	Apply their ecological knowledge to illustrate and graph a problem and describe the realities that managers face when dealing with complex issues

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1			2				2							2
CO2			1				1							2
CO3			1				1							1
CO4			1				1							1
AVERAGE			1.5				1.5							1.75

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ODD SEMESTER - VII

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

Course Name : Computer Networks
Course Code : 18EC71

Cos	Statements
C705.1	Understand the concepts of networking.
C705.2	Describe the various networking architectures
C705.3	Identify the protocols and services of different layers
C705.4	Distinguish the basic network configurations and standards associated with each network
C705.5	Analyze a simple network and measure its parameters

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	1	1	1		1							1	
CO2	1	2	2	1									1	
CO3	1	1	1	1									1	
CO4	1												1	
CO5	1			1										
AVERAGE	1	1	1	1									1	

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ODD SEMESTER - VII

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

Course Name : VLSI Design
Course Code : 18EC72

Cos	Statements
C705.1	Demonstrate understanding of MOS transistor theory, CMOS fabrication flow and technology scaling
C705.2	Draw the basic gates using the stick and layout diagrams with the knowledge of physical design aspects
C705.3	Demonstrate ability to design Combinational, sequential and dynamic logic circuits as per there requirements
C705.4	Interpret Memory elements along with timing considerations
C705.5	Interpret testing and testability issues in VLSI Design

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	1	1	1		1							2	
CO2	2	1	1	1		1							2	
CO3	2	1	1	1		2							2	
CO4	2	1	1	1		2							2	
CO5	2	1	1	1									2	
AVERAGE	1	1	1	1		2							2	

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ODD SEMESTER - VII

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

Course Name : Real Time System
Course Code : 18EC731

Cos	Statements
C705.1	Explain the fundamentals of Real time systems and its classifications
C705.2	Understand the concepts of computer control and the suitable computer hardware requirements for real-time applications
C705.3	Describe the operating system concepts and techniques required for real time systems
C705.4	Develop the software algorithms using suitable languages to meet Real
C705.5	Time applications

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	1		1		1							1	
CO2	1												1	
CO3	1												1	
CO4	1												1	
CO5	1												1	
AVERAGE	1	1		1		1							1	

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ODD SEMESTER - VII

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

Course Name : Computer Networks Laboratory
Course Code : 18ECL76

Cos	Statements
C705.1	Choose suitable tools to model a net work
C705.2	Use the network simulator for learning and practice of networking algorithms
C705.3	Illustrate the operations of network protocols and algorithms using C programming
C705.4	Simulate the network with different configurations to measure the performance parameters
C705.5	Implement the data link and routing protocols using C programming.

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	1	1	1		1							1	
CO2	2	1	1	1		1							1	
CO3	1	1	1	1		1							1	
CO4	1	1	1	1		1							1	
CO5	1	1	1	1		1							1	
AVERAGE	1.4	1	1	1		1							1	

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CITY ENGINEERING COLLEGE

ACADEMIC YEAR: 2021-22

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ODD SEMESTER - VII

2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

Course Name : VLSI Laboratory
Course Code : 18ECL77

Cos	Statements
C705.1	Design and simulate combinational and sequential digital circuits using Verilog HDL
C705.2	Understand the Synthesis process of digital circuits using EDA tool
C705.3	Perform ASIC design flow and understand the process of synthesis, synthesis constraints and evaluating the synthesis reports to obtain optimum gate level net list
C705.4	Design and simulate basic CMOS circuits like inverter, common source amplifier and differential amplifiers
C705.5	Perform RTL –GDSII flow and understand the stages in ASIC design

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	1	1	1									2	
CO2	1	1	1			1							1	
CO3	1	1	1	1		1							2	
CO4	2	1	1	1		1							1	
CO5	1	1	1	1		1							2	
AVERAGE	1.75	1	1	1		1							2	

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2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

ACADEMIC YEAR:2021-22

ODD SEMESTER-III

CourseName:Transform Calculus, Fourier Series And Numerical Techniques Course Code:18MAT31/C301

Cos	Statements
C301.1	Use Laplace transform and inverse Laplace transform in solving differential/ integral equation arising in network analysis, control systems and other fields of engineering.
C301.2	Demonstrate Fourier series to study the behaviour of periodic functions and their applications in system communications, digital signal processing and field theory.
C301.3	Make use of Fourier transform and Z-transform to illustrate discrete/continuous function arising in wave and heat propagation, signals and systems.
C301.4	Solve first and second order ordinary differential equations arising in engineering problems using single step and multistep numerical methods.
C301.5	Determine the externals of functionals using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis.

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	1	1	1							1	1	1	1
CO2	2	2	1	1	1				2	1		2	1	1	3
CO3	3	3	3	1	1					1		2	2	2	2
CO4	3	3	3	3	1	1		1	1	3		2	3	1	1
CO5	2	3	3	1	2					1		3	2	1	2
AVG	2.6	2.4	2.2	1.4	1.2	1	0	1	1.5	1.5	0	2	1.8	1.2	1.8

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2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

ACADEMIC YEAR:2021-22

ODD SEMESTER-III

Course Name: Data Structures and Applications **Course Code: 18CS32 /C302**

Cos	Statements
C302.1	Use different types of data structures, operations and algorithms
C302.2	Apply searching and sorting operations on files
C302.3	Use stack, Queue, Lists, Trees and Graphs in problem solving
C302.4	Implement all data structures in a high-level language for problem solving.
C302.5	Implement all data structures in a high-level language for problem solving.

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	1	1	1							1	1	1	3
CO2	2	3	1	1	1							1	1	2	2
CO3	2	2	1	2	1							1	1	1	2
CO4	1	3	2	1	1							1	1	1	1
CO5	3	2	2	1	1							1	1	1	3
AVG	2.2	2.2	1.4	1.2	1	0	0	0	0	0	0	1	1	1.2	2.2

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2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

ACADEMIC YEAR:2021-22

ODD SEMESTER-III

Course Name: Analog and Digital Electronics **Course Code: 18CS33 /C303**

Cos	Statements
C303.1	Design and analyze application of analog circuits using photo devices, timer IC, power supply and regulator IC and op-amp.
C303.2	Explain the basic principles of A/D and D/A conversion circuits and develop the same.
C303.3	Simplify digital circuits using Karnaugh Map , and Quine-McClusky Methods
C303.4	Explain Gates and flip flops and make us in designing different data processing circuits, registers and counters and compare the types.
C303.5	Develop simple HDL programs

CO-PO Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	2	1	1							3	1	1	3
CO2	1	1	2	1	1							2	1	2	2
CO3	1	1	2	1	1							2	1	1	2
CO4	1	1	1	1	1							2	1	2	1
CO5	1	1	1	2	1							3	1	2	3
AVG	1	1	1.6	1.2	1	0	0	0	0	0	0	2.4	1	1.6	2.2

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2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

ACADEMIC YEAR:2021-22

ODD SEMESTER-III

Course Name: Computer Organization **Course Code: 18CS34 /C304**

Cos	Statements
C304.1	Explain the basic organization of a computer system.
C304.2	Demonstrate functioning of different sub systems, such as processor, Input/output,and memory.
C304.3	Illustrate hardwired control and micro programmed control, pipelining, embedded and other computing systems.
C304.4	Illustrate hardwired control and micro programmed control, pipelining, embedded and other computing systems.
C304.5	Design and analyse simple arithmetic and logical units.

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	1	1	1	1							1	2	1
CO2	3	1	1	1								2	2	1	2
CO3	3	3	3	3	1								3	3	3
CO4	1	3	3	1	1								2	2	2
CO5	3	3	3	1	3	3						1	3	3	3
AVG	2.6	2.2	2.2	1.4	1.5	2	0	0	0	0	0	1.5	2.2	2.2	2.2

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2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

ACADEMIC YEAR:2021-22

ODD SEMESTER-III

Course Name: Software Engineering **Course Code: 18CS35/C305**

Cos	Statements
C305.1	Design a software system, component, or process to meet desired needs within realistic constraints.
C305.2	Assess professional and ethical responsibility
C305.3	Function on multi-disciplinary teams
C305.4	Use the techniques, skills, and modern engineering tools necessary for engineering practice
C305.5	Analyze, design, implement, verify, validate, implement, apply, and maintain software systems or parts of software systems

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	1	1	1								1	1	1
CO2	2	2	1	1	1								1	1	1
CO3	3	3	1	1	1								1	2	2
CO4	3	3	1	1	1								1	1	1
CO5	2	3	1	1	1								1	1	2
AVG	2.6	2.4	1	1	1	0	0	0	0	0	0	0	1	1.2	1.2

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2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

ACADEMIC YEAR:2021-22

ODD SEMESTER-III

Course Name: Discrete Mathematical Structures **Course Code:18CS36/C306**

Cos	Statements
C306.1	Use propositional and predicate logic in knowledge representation and truth verification.
C306.2	Demonstrate the application of discrete structures in different fields of computer science.
C306.3	Solve problems using recurrence relations and generating functions.
C306.4	Application of different mathematical proofs techniques in proving theorems in thecourses.
C306.5	Compare graphs, trees and their applications

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	1	1	1							1	1	1	1
CO2	2	2	1	1	1				2	1		2	1	1	3
CO3	3	3	3	1	1					1		2	2	2	2
CO4	3	3	3	3	1	1		1	1	3		2	3	1	1
CO5	2	3	3	1	2					1		3	2	1	2
AVG	2.6	2.4	2.2	1.4	1.2	1	0	1	1.5	1.5	0	2	1.8	1.2	1.8

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2.6.1 Program outcomes, program specific outcomes and course outcomes for all programs offered by the Institution

DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

ACADEMIC YEAR:2021-22

ODD SEMESTER-III

Course Name: Analog and Digital Electronics Laboratory **Course Code:18CSL37/C306**

Cos	Statements
C306.1	Analog components and circuits including Operational Amplifier, Timer, etc.
C306.2	Combinational logic circuits.
C306.3	Flip - Flops and their operations
C306.4	Counters and registers using flip-flops. .
C306.5	Synchronous and Asynchronous sequential circuits.

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DEPARTMENT OF INFORMATION SCIENCE AND ENGINEERING

ACADEMIC YEAR:2021-22

ODD SEMESTER-III

Course Name: Data Structures Laboratory **Course Code:18CSL38/C306**

Cos	Statements
C306.1	Asymptotic performance of algorithms.
C306.2	Linear data structures and their applications such as stacks, queues and lists
C306.3	Flip - Flops and their operations
C306.4	Non-Linear data structures and their applications such as trees and graphs
C306.5	Sorting and searching algorithms .

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Department of Mechanical Engineering
ACADEMIC YEAR 2021-2022
Course Outcomes

Subject: Engineering Mathematics-III		**Subject Code:**18MAT31
Course Outcomes		
CO1	Know the use of periodic signals and Fourier series to analyze circuits and systems communication.	
CO2	Explain the general linear system theory for continuous - time signals and digital signal processing using the Fourier transform and z-transform.	
CO3	Employ appropriate numerical methods to solve algebraic and transcendental equations.	
CO4	Apply Green's theorem, Divergence theorem and Stokes theorem in various applications in the field of electro-magnetic and gravitational fields and fluid flow problems.	
CO5	Determine the externals of functional and solve the simple problems for calculus of variations. Utilize the concepts of functional and their variations in the applications of communication systems, decision theory, synthesis and optimization of digital circuits.	

Subject: MECHANICS OF MATERIALS		**Subject Code:** 18ME32
Course Outcomes		
CO1	Apply an engineering knowledge to demonstrate the behaviour of materials	
CO2	Analyze the thin and thick cylinders and draw a stress distribution curve, also to create Mohrs circle diagram for plane stress conditions.	
CO3	Determine the various forces and moments in beams	
CO4	Evaluate the dimensions of mechanical elements for various applications.	
CO5	Compare different strain energy methods and theories of failures in design of machineries	

Subject: BASIC THERMODYNAMICS		**Subject Code:**18ME33
Course Outcomes		
CO1	Explain fundamentals of thermodynamics and evaluate energy interactions across the boundary of thermodynamic systems.	
CO2	Apply 1st law of thermodynamics to closed and open systems and determine quantity of energy transfers and change in properties.	
CO3	Apply the knowledge of entropy and 2nd law of thermodynamics to solve numerical problems.	
CO4	Interpret the behavior of pure substances and its application in practical problems, reversibility and irreversibility to solve numerical problems.	
CO5	Evaluate thermodynamic properties of ideal and real gas mixtures using various relations.	

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Subject: MATERIAL SCIENCE		**Subject Code:**18ME34
Course Outcomes		
CO1	**Understand** the fundamentals of structure and behavior of engineering materials for various mechanical applications	
CO2	**Analyse** the various modes of failure of engineering material	
CO3	**Assess** the structural and physical properties of engineering materials through various heat treatment process	
CO4	**Perceive** various properties of composites, its application and to provide an alternate to conventional structural materials	
CO5	**Propose** alternate materials which are sustainable, economic and enable new product generation	

Subject: METAL CUTTING AND FORMING		**Subject Code:** 18ME35A
Course Outcomes		
CO1	Apply the knowledge of metal cutting using basic machine tools fro the production of components	
CO2	Choose the right cutting material and fluids and also evaluate cutting tool parameters for different machining operations	
CO3	Evaluate tool life on the basis of wear and wear rate and also discuss the economics of machining process of various cutting tool	
CO4	Apply the knowledge of sheet metal forming for production of components	
CO5	Design different sheet metal dies for simple sheet metal components	

Subject: COMPUTER AIDED MACHINE DRAWING		**Subject Code:** 18ME36A
Course Outcomes		
CO1	To read and understand the orthographic and sectional views of various machine components	
CO2	To develop 3D models using modeling software's	
CO3	To produce 2D drawings by manual drafting and by using drafting packages	
CO4	To construct assembly drawings, part drawings and Bill of materials as per BIS Conventions	
CO5	To apply limits fits and tolerance to all assemblies and part drawings	

Subject: MATERIAL TESTING LAB		**Subject Code:** 18ME37A
Course Outcomes		
CO1	Acquire experimentation skills in the field of material testing	
CO2	Develop theoretical understanding of the mechanical properties of materials by performing experiments	
CO3	Apply the knowledge to analyze a material failure and determine the failure inducing agents	
CO4	Apply the knowledge of testing methods in related areas	
CO5	Understand how to improve structure/behavior of materials for various industrial applications.	

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Subject: WORKSHOP AND MACHINE SHOP PRACTICE		**Subject Code:** 18ME38A
Course Outcomes		
CO1	Understand integral parts of lathe, shaping and milling machines and various accessories and attachments used.	
CO2	Select cutting parameters like cutting speed, feed, depth of cut, and tooling for various machining operations	
CO3	Perform cylindrical turning operations such as plain turning, taper turning, step turning, thread Cutting, facing, knurling, internal thread cutting, eccentric turning and estimate cutting time	
CO4	Perform machining operations such as plain shaping, inclined shaping, keyway cutting, Indexing and Gear cutting and estimate cutting time	
CO5	Prepare fitting models according to drawings using hand tools- V-block, marking gauge, files, hack saw, drills etc	

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Subject: MANAGEMENT AND ECONOMICS		**Subject Code:**18ME51
Course Outcomes		
CO1	Explain the development of management and the role it plays at different levels in an organization	
CO2	Comprehend the process and role of effective planning, organizing and staffing for the development of an organization	
CO3	Understand the necessity of good leadership, communication and coordination for establishing effective control in an organization	
CO4	Understand engineering economics demand supply and its importance in economic decision making and problem solving	
CO5	Calculate present worth, annual worth and IRR for different alternatives in economic decision making	

Subject: DESIGN OF MACHINE ELEMENTS I		**Subject Code:**18ME52
Course Outcomes		
CO1	Apply the concepts of selection of materials for given mechanical components	
CO2	List the functions and uses of machine elements used in mechanical systems.	
CO3	Apply codes and standards in the design of machine elements and select an element based on the Manufacturer's catalogue.	
CO4	Analyse the performance and failure modes of mechanical components subjected to combined loading and fatigue loading using the concepts of theories of failure.	
CO5	Demonstrate the application of engineering design tools to the design of machine components like shafts, couplings, power screws, fasteners, welded and riveted joints.	
CO6	Understand the art of working in a team	

Subject: DYNAMICS OF MACHINES		**Subject Code:**18ME53
Course Outcomes		
CO1	Estimate the forces and couples for four bars and slider crank mechanisms to keep the system in equilibrium	
CO2	Analyze and estimate balancing of rotating & reciprocating masses in same and different planes	
CO3	Applying principles of governors and gyroscope and its applications	
CO4	Analyze different modes of vibration for damped vibration with single degree of freedom systems	
CO5	Compare modes of vibration for forced and damped vibration with single degree of freedom systems	

Subject: TURBO MACHINES		**Subject Code:**18ME54
Course Outcomes		
CO1	Model studies and thermodynamics analysis of turbo machines.	
CO2	Analyze the energy transfer in Turbo machine with degree of reaction and utilization factor.	
CO3	Classify, analyze and understand various type of steam turbine.	
CO4	Classify, analyze and understand various type of hydraulic turbine.	
CO5	Understand the concept of radial power absorbing machine and the problems involved during its operation.	

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Subject: FLUID POWER ENGINEERING	**Subject Code:**18ME55
Course Outcomes	
CO1	Understand the basic concepts (principles) of working and maintenance of fluid power system with its potential applications.
CO2	Interpret the construction and working of input and output elements of fluid power systems viz. hydraulic and pneumatic pumps, motors and cylinders.
CO3	Demonstrate the functioning of control valves for obtaining desired output from fluid power systems.
CO4	Formulate (construct) the hydraulic and pneumatic circuits for various outputs
CO5	Integrate fluid power system with electrical and logic elements, controls to maintain the sequence of operations

Subject: OPERATIONS MANAGEMENT	**Subject Code:**18ME56
Course Outcomes	
CO1	Understand the fundamental basis and nature of operation management techniques for the manufacturing Industry and also to assess a range of strategies for improving the efficiency and effectiveness of organizational operations
CO2	Analyze the appropriateness and applicability of a range of operations management systems/models in decision making and forecasting techniques.
CO3	Evaluate various facility alternatives and their capacity decisions and sequencing techniques in operations management environment.
CO4	Summarize Aggregate Planning & Master Scheduling methods by graphical, charting techniques and mathematical techniques as applied to product and process industries.
CO5	Assess the operational issues between Industry, vendor and customer by using Material Requirement Planning (MRP), Purchasing and Supply Chain Management (SCM).

Subject: FLUID MECHANICS/MACHINES LAB															**Subject Code:**18MEL57
Course Outcomes															
CO1	Perform experiments to determine the coefficient of discharge of flow measuring devices.														
CO2	Conduct experiments on hydraulic turbines and pumps to draw characteristics.														
CO3	Determine the frictional losses for flow through pipe.														
CO4	Apply the momentum equation for determination of coefficient of impact of jet on vanes.														
CO5	Test the performance of reciprocating air compressor and air blower.														
CO4	3	1											2		
CO5	3	2							1				2		

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Subject: ENERGY CONVERSION LAB		**Subject Code:**18MEL58
Course Outcomes		
CO1	Perform experiments to determine the properties of Fuels and Oils.	
CO2	Conduct experiments on Internal Combustion engines to determine performance parameters.	
CO3	Identify Exhaust Emission and factors affecting them.	
CO4	Exhibit his competency towards preventive maintenance of Internal Combustion engines.	

Subject: ENVIRONMENTAL STUDIES		**Subject Code:**18CIV59
Course Outcomes		
CO1	Understand the principles of ecology and environmental issues that apply to air, land, and water issues on a global scale	
CO2	Develop critical thinking and/or observation skills, and apply them to the analysis of a problem or question related to the environment	
CO3	Demonstrate ecology knowledge of a complex relationship between biotic and abiotic components	
CO4	Apply their ecological knowledge to illustrate and graph a problem and describe the realities that managers face when dealing with complex issues.	

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Subject: CONTROL ENGINEERING	**Subject Code:**18ME71
Course Outcomes	
CO1	Identify the control system and its types , control actions
CO2	Construct the system governing equations for physical models(Electrical, Thermal, Mechanical, Electro Mechanical
CO3	Analyze the gain of the system using block diagram and signal flow graph
CO4	Evaluate the stability of Control system in complex domain and frequency domain
CO5	Employ state equations to study the Bode's plot

Subject: COMPUTER AIDED DESIGN AND MANUFACTURING	**Subject Code:**18ME72
Course Outcomes	
CO1	Define automation, CIM,CAD,CAM& explain 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 flowlines to reduce time and enhance productivity
CO4	Explain the use of different computer applications in manufacturing and able to prepare part program for simple jobs on CNCand Robot Programming
CO5	Visualize and appreciate the modern trends in manufacturing like additive manufacturing industry 4.0 and applications of IOT leading to smart manufacturing.

Subject: TOTAL QUALITY MANAGEMENT	**Subject Code:**18ME734
Course Outcomes	
CO1	Explain the various approaches of TQM
CO2	Infer the customer perception of quality
CO3	Analyze customer needs and perception to design feed back systems
CO4	Apply statistical tools for continuous improvement of systems
CO5	Apply the tools and technology for effective improvement of TQM

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Subject: ENERGY AND ENVIRONMENT	**Subject Code:**18ME751
Course Outcomes	
CO1	To understand the fundamentals of energy sources, energy use, energy efficiency, and resulting environmental implications of various energy supplies
CO2	To introduce various aspects of environmental pollution and its control
CO3	To understand the causes and remedies related to social issues like global warming, ozone layer depletion, climate change etc
CO4	To introduce various acts related to prevention and control of pollution of water and air, forest protection act, wild life protection act etc.

Subject: COMPUTER INTEGRATED MANUFACTURING LAB	**Subject Code:**18MEL76
Course Outcomes	
CO1	Generate CNC Lathe part programs for different turning operations.
CO2	Generate CNC Mill Part programs for point to point motions & line motions
CO3	Make use of Canned Cycles for Drilling, Peck drilling, Boring, Tapping, Turning, Facing,Taper turning Thread cutting etc.
CO4	Simulate Tool Path for different machining operations using CNC TRAIN software.

Subject: DESIGN LAB	**Subject Code:**18MEL77
Course Outcomes	
CO1	Analyze principal stresses, strains in members subjected to various loading using Strain Gauge Rosettes
CO2	Evaluate the parameters for single DOF of vibrational systems and identify critical speed of shaft for different modes
CO3	Estimate the parameters of journal bearing, governor and apply the knowledge of dynamics to balance the rotating masses
CO4	Apply the concept of photo elasticity for stress analysis and to calibrate photo elastic models

Subject: Project Phase I	**Subject Code:**18MEP78
Course Outcomes	
CO1	Review the research literature,identify and analyze the complex engineering problems, formulate the sustainable conclusions or solutions using the basic principles of applied mathematics,science and engineering
CO2	Design proper methodology to derive the solutions for the existing or anticipated complex engineering problems in concern with the issues of public health, safety societal, cultural and environmental areas.
CO3	Practice and establish the professional engineering methodology for sustainable development in the society to address the complex engineering problems associated with societal and environmental factors.
CO4	Form internal & external group to work together as a team in the project under consideration under multi-disciplinary settings.
CO5	Communicate effectively addressing the complex engineering activities with documentation reports and proper presentation tools.

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Department of Basic Science

2.6.1 QlM Programme Outcomes (POs) and Course Outcomes (COs) offered by the department (EVEN and ODD) ACY 2021-2022

I YEAR COURSES

Sl. No	Course Name	Course Code
1	Calculus and Differential Equations	21MAT11
2	Engineering Physics	21PHY12/22
3	Basic Electrical Engineering	21ELE13/21ELE23
4	Engineering Visualization	21EVN15/25
5	Engineering Physics Laboratory	21PHYL16/26
6	Basic Electrical Engineering Laboratory	21ELE17/27
7	Communicative English	21EGH18
8	Innovation and Design Thinking	21ITD19
9	Engineering Chemistry	21CHE12/22
10	Problem-Solving Through Programming	21PSP23/13
11	Basic Electronics & Communication Engineering	21ELN14/24
12	Elements of Mechanical Engineering	21EME15/25
13	Engineering Chemistry Laboratory	21CHEL16/26
14	Computer Programming Laboratory	21CPL27/17
15	Scientific Foundations of Health	21SFH19/29
16	Professional Writing Skills in English	21EGH28
17	Advanced Calculus and Numerical Methods	21MAT21

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DEPARTMENT OF BASIC SCIENCE

ACADEMIC YEAR 2021-22

COURSE OUTCOMES OF I YEAR

Course Name: CALCULUS AND DIFFERENTIAL EQUATIONS
Course Code: 21MAT11[C101]

COs	STATEMENT
C101.1	Apply the knowledge of calculus to solve problems related to polar curves and its applications in determining the bentness of a curve.
C101.2	Learn the notion of partial differentiation to calculate rate of change of multivariate functions and solve problems related to composite functions and Jacobian.
C101.3	Solve first-order linear/nonlinear ordinary differential equations analytically using standard methods
C101.4	Demonstrate various models through higher order differential equations and solve such linear ordinary differential equations.
C101.5	Test the consistency of a system of linear equations and to solve them by direct and iterative methods.

CO-PO-PSO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C101.1	3	2											3	1	
C101.2	3	2											3		
C101.3	3	2											3	1	
C101.4	3	2											3		
C101.5	3	2											3		

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Course Name: Engineering Physics

Course Code: 21PHY12/22 [C102]

COs	STATEMENT
C102.1	Interpret the types of mechanical vibrations and their applications, the role of Shock waves in various fields.
C102.2	Demonstrate the quantization of energy for microscopic system.
C102.3	Apply LASER and Optical fibers in opto electronic system.
C102.4	Illustrate merits of quantum free electron theory and applications of Hall effect.
C102.5	Analyze the importance of XRD and Electron Microscopy in Nano material characterization

CO-PO-PSO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C102.1	2	2											2		
C102.2	2	2											2		
C102.3	2	2											3		
C102.4	2	2											1		
C102.5	2	2											1		

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Course Name: BASIC ELECTRICAL ENGINEERING

Course Code: 21ELE13/21ELE23 [C103]

COs	STATEMENT
C103.1	Analyze basic DC and AC electric circuits.
C103.2	Explain the working principles of transformers and electrical machines.
C103.3	Explain the concepts of electric power transmission and distribution of power.
C103.4	Understand the wiring methods, electricity billing, and working principles of circuit protective devices and personal safety measures.

CO-PO-PSO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C103.1	3	3											3		
C103.2	3	3											3		
C103.3	3					2							3		
C103.4	3					2		2					3	1	

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Course Name: Engineering Visualization
Course Code: 21EVN15/25 [C104]

COs	STATEMENT
C104.1	Understand and visualize the objects with definite shape and dimensions
C104.2	Analyze the shape and size of objects through different views
C104.3	Develop the lateral surfaces of the object
C104.4	Create a 3D view using CAD software.
C104.5	Identify the interdisciplinary engineering components or systems through its graphical representation.

CO-PO-PSO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C104.1	3	3			3							1	2	3	
C104.2	3	3			3							1	2	3	
C104.3	3	3			3							1	2	3	
C104.4	3	3			3							1	2	3	
C104.5	3	3			3							1	2	3	

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Course Name: ENGINEERING PHYSICS LABORATORY
Course Code: 21PHYL16/26 [C105]

COs	STATEMENT
C105.1	Understand the measuring techniques
C105.2	Operate different instruments and be capable to analyze the experimental results.
C105.3	Construct the circuits and their analysis.

CO-PO-PSO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C105.1	3			3											
C105.2	3			3									1		
C105.3	3			3											

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Course Name: BASIC ELECTRICAL ENGINEERING LABORATORY
Course Code: 21ELE17/27 [C106]

COs	STATEMENT
C106.1	Verify KCL and KVL and maximum power transfer theorem for DC circuits.
C106.2	Compare power factors of different types of lamps.
C106.3	Demonstrate the measurement of the impedance of an electrical circuit and power consumed by a 3-phase load.
C106.4	Analyze two-way and three-way control of lamps.
C106.5	Explain the effects of open and short circuits in simple circuits.
C106.6	Interpret the suitability of earth resistance measured.

CO-PO-PSO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C106.1	2	2				1				1			3		
C106.2	2	2				1				1			1		
C106.3	2	1				1				1			1		
C106.4	2	2				1				1					
C106.5	2					1	1	1		1					

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Course Name: Communicative English

Course Code: 21EGH18 [C107]

COs	STATEMENT
C107.1	Understand and apply the Fundamentals of Communication Skills in their communication skills.
C107.2	Identify the nuances of phonetics, intonation and enhance pronunciation skills.
C107.3	To impart basic English grammar and essentials of language skills as per present requirement.
C107.4	Understand and use all types of English vocabulary and language proficiency.
C107.5	Adopt the Techniques of Information Transfer through presentation.

CO-PO-PSO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C107.1										2		2			
C107.2										1		1			
C107.3										2		1			
C107.4										1		2			
C107.5										3		3			1

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Course Name: INNOVATION AND DESIGN THINKING
Course Code: 21IDT19 [C108]

COs	STATEMENT
C108.1	Appreciate various design process procedure
C108.2	Generate and develop design ideas through different technique
C108.3	Identify the significance of reverse Engineering to Understand products
C108.4	Draw technical drawing for design ideas

CO-PO-PSO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C108.1	3														
C108.2	3														
C108.3	3														
C108.4	3														1

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Course Name: ENGINEERING CHEMISTRY

Course Code: 21CHE12/22 [C109]

COs	STATEMENT
C109.1	Discuss the electrochemical energy systems such as electrodes and batteries.
C109.2	Explain the fundamental concepts of corrosion, its control and surface modification methods namely electroplating and electroless plating
C109.3	Enumerate the importance, synthesis and applications of polymers. Understand properties and application of nanomaterials.
C109.4	Describe the principles of green chemistry, understand properties and application alternative fuels.
C109.5	Illustrate the fundamental principles of water chemistry, applications of volumetric and analytical instrumentation

CO-PO-PSO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C109.1	3	1			1	1									
C109.2	3	2				1						1			
C109.3	3					1							2		
C109.4	3					2	1					1	1		
C109.5	3					2								1	

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Course Name: PROBLEM-SOLVING THROUGH PROGRAMMING
Course Code: 21PSP23/13 [C110]

COs	STATEMENT
C110.1	Elucidate the basic architecture and functionalities of a computer and also recognize the hardware parts.
C110.2	Apply programming constructs of C language to solve the real-world problem
C110.3	Explore user-defined data structures like arrays in implementing solutions to problems like searching and sorting
C110.4	Explore user-defined data structures like structures, unions and pointers in implementing solutions
C110.5	Design and Develop Solutions to problems using modular programming constructs using functions

CO-PO-PSO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C110.1	3	2	2										3		
C110.2	3	3	2	3									3		
C110.3	2	3	3	2	2								3	1	
C110.4	2	3	3	2									3	1	
C110.5	3	2	2	2									3	2	

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Course Name: BASIC ELECTRONICS & COMMUNICATION ENGINEERING
Course Code: 21ELN14/24 [C111]

COs	STATEMENT
C111.1	Describe the concepts of electronic circuits encompassing power supplies, amplifiers and oscillators.
C111.2	Present the basics of digital logic engineering including data representation, circuits and the microcontroller system with associated sensors and actuators.
C111.3	Discuss the characteristics and technological advances of embedded systems.
C111.4	Relate to the fundamentals of communication engineering spanning from the frequency spectrum to the various circuits involved including antennas.
C111.5	Explain the different modes of communications from wired to wireless and the computing involve

CO-PO-PSO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C111.1	3	1											1		
C110.2	3	1											2		
C110.3	3	1											2		
C110.4	3	1											3		
C110.5	3	1											1		

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Course Name: ELEMENTS OF MECHANICAL ENGINEERING
Course Code: 21EME15/25 [C112]

COs	STATEMENT
C112.1	Understand basic concepts of mechanical engineering in the fields of energy and its utilization, materials technology, manufacturing techniques, and transmission systems through demonstrations.
C112.2	Understand the application of energy sources in Power generation and utilization, Engineering materials, manufacturing, and machining techniques leading to the latest advancements and transmission systems in day to day activities
C112.3	Apply the skills in developing simple mechanical elements and processes

CO-PO-PSO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C112.1	3						1						2		
C112.2	3						1						2		
C112.3	2				1								2	3	

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Course Name: ENGINEERING CHEMISTRY LABORATORY

Course Code: 21CHEL16/26 [C113]

COs	STATEMENT
C113.1	Determine the pKa and coefficient of Viscosity of a given organic liquid
C113.2	Estimate the amount of substance present in the given solution using Potentiometer Conductometric and Colorimetric.
C113.3	Determine the total hardness and chemical oxygen demand in the given solution by volumetric analysis method
C113.4	Estimate the percentage of Nickel, copper and Iron in the given analyte solution by titration method.
C113.5	Demonstrate flame photometric estimation of sodium & potassium and the synthesis of nanomaterials by Precipitation method.

CO-PO-PSO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C113.1	3	1													
C113.2	3	1											1		
C113.3	3	1					1								
C113.4	3	1													
C113.5	3	1											1		

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Course Name: COMPUTER PROGRAMMING LABORATORY
Course Code: 21CPL27/17 [C114]

COs	STATEMENT
C114.1	Define the problem statement and identify the need for computer programming
C114.2	Make use of C compiler, IDE for programming, identify and correct the syntax and syntactic errors in programming
C114.3	Develop algorithm, flowchart and write programs to solve the given problem
C114.4	Demonstrate use of functions, recursive functions, arrays, strings, structures and pointers in problem solving.
C114.5	Document the inference and observations made from the implementation

CO-PO-PSO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C114.1	3	2	2										2		
C114.2	3	3	2										3		
C114.3	3	3	3										2		
C114.4	3	3	3	1									2	2	
C114.5	1														

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Course Name: Scientific Foundations of Health

Course Code: 21SFH19/29 [C115]

COs	STATEMENT
C115.1	To understand Health and wellness (and its Beliefs)
C115.2	To acquire Good Health & It's balance for positive mindset
C115.3	To inculcate and develop the healthy lifestyle habits for good health
C115.4	To Create of Healthy and caring relationships to meet the requirements of MNC and LPG world
C115.5	To adopt the innovative & positive methods to avoid risks from harmful habits in their campus & outside the campus.
C115.6	To positively fight against harmful diseases for good health through positive mindset.

CO-PO-PSO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C115.1						1		1	1	1		1			
C115.2						1		1	1	1		1		1	
C115.3						1		1	1	1		1			
C115.4						1		1	1	1		1			
C115.5						1		1	1	1		1	1		
C115.6								1	1	1		1			

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Course Name: Professional Writing Skills in English

Course Code: 21EGH28 [C201]

COs	STATEMENT
C201.1	To understand and identify the Common Errors in Writing and Speaking.
C201.2	To Achieve better Technical writing and Presentation skills.
C201.3	To read Technical proposals properly and make them to Write good technical reports.
C201.4	Acquire Employment and Workplace communication skills.
C201.5	To learn about Techniques of Information Transfer through presentation in different level.

CO-PO-PSO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C201.1										2		2			
C201.2										2		2			
C201.3										2		2		1	
C201.4										2		2			1
C201.5										2		2			

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Course Name: ADVANCED CALCULUS AND NUMERICAL METHODS
Course Code: 21MAT21 [C202]

COs	STATEMENT
C202.1	Apply the concept of change of order of integration and change of variables to evaluate multiple integrals and their usage in computing the area and volume.
C202.2	Illustrate the applications of multivariate calculus to understand the solenoidal and irrotational vectors and also exhibit the inter dependence of line, surface and volume integrals.
C202.3	Formulate physical problems to partial differential equations and to obtain solution for standard practical PDE's
C202.4	Apply the knowledge of numerical methods in modelling of various physical and engineering phenomena
C202.5	Solve first order ordinary differential equations arising in engineering problems.

CO-PO-PSO Mapping:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C202.1	3	2													
C202.2	3	2													
C202.3	3	2											2		
C202.4	3	2											2	2	
C202.5	3	2											2	2	

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