



Doddakallasandra, Bangalore-560061

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**DEPARTMENT OF CIVIL ENGINEERING**

**ACADEMIC YEAR 2020-21**

**COURSE OUTCOMES (EVEN)**

**8<sup>th</sup> Semester**

**COURSE NAME: QUANTITY SURVEYING AND CONTRACTS MANAGEMENT**

**COURSE CODE: 17CV81(C801)**

<b>COs</b>	<b>STATEMENTS</b>
C801.1	Prepare detailed and abstract estimates for roads and building.
C801.2	Prepare valuation reports of buildings.
C801.3	Interpret Contract documents of domestic and international construction works



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## DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2020-21

COURSE OUTCOMES (EVEN)

8<sup>th</sup> Semester

COURSE NAME: DESIGN OF PRE-STRESSED CONCRETE ELEMENTS

COURSE CODE: 17CV82(C802)

COs	STATEMENTS
C802.1	Understand the requirement of PSC members for present scenario.
C802.2	Analyse the stresses encountered in PSC element during transfer and at working.
C802.3	Understand the effectiveness of the design of PSC after studying losses
C802.4	Capable of analyzing the PSC element and finding its efficiency.
C802.5	Design PSC beam for different requirements.



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## DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2020-21

COURSE OUTCOMES (EVEN)

8<sup>th</sup> Semester

COURSE NAME: PAVEMENT DESIGN

COURSE CODE: 17CV833(C803)

COs	STATEMENTS
C803.1	Systematically generate and compile required data for design of pavement (Highway & Airfield).
C803.2	Analyze stress, strain and deflection by boussinesq's, burmister's and westergaard's theory.
C803.3	Design rigid pavement and flexible pavement conforming to IRC58-2002 and IRC37-2001.
C803.4	Evaluate the performance of the pavement and also develops maintenance statement based on site specific requirements.



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## DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2020-21

COURSE OUTCOMES (EVEN)

6<sup>th</sup> Semester

**COURSE NAME: DESIGN OF STEEL STRUCTURAL ELEMENTS**

**COURSE CODE: 18CV61(C601)**

COs	STATEMENTS
C601.1	Possess knowledge of Steel Structures Advantages and Disadvantages of Steel structures, steel code provisions and plastic behaviour of structural steel.
C601.2	Understand the Concept of Bolted and Welded connections.
C601.3	Understand the Concept of Design of compression members, built-up columns and columns splices.
C601.4	Understand the Concept of Design of tension members, simple slab base and gusseted base.
C601.5	Understand the Concept of Design of laterally supported and un-supported steel beams.



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## DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2020-21

COURSE OUTCOMES (EVEN)

6<sup>th</sup> Semester

**COURSE NAME: APPLIED GEOTECHNICAL ENGINEERING**

**COURSE CODE: 18CV62(C602)**

COs	STATEMENTS
C602.1	Ability to plan and execute geotechnical site investigation program for different civil engineering projects
C602.2	Understanding of stress distribution and resulting settlement beneath the loaded footings on sand and clayey soils
C602.3	Ability to estimate factor of safety against failure of slopes and to compute lateral pressure distribution behind earth retaining structures
C602.4	Ability to determine bearing capacity of soil and achieve proficiency in proportioning shallow isolated and combined footings for uniform bearing pressure
C602.5	Capable of estimating load carrying capacity of single and group of piles



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## DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2020-21

COURSE OUTCOMES (EVEN)

6<sup>th</sup> Semester

COURSE NAME: HYDROLOGY AND IRRIGATION ENGINEERING

COURSE CODE: 18CV63(C603)

COs	STATEMENTS
C603.1	Understand the importance of hydrology and its components.
C603.2	Measure precipitation and analyze the data and analyze the losses in precipitation
C603.3	Estimate runoff and develop unit hydrographs.
C603.4	Find the benefits and ill-effects of irrigation
C603.5	Find the quantity of irrigation water and frequency of irrigation for various crops.
C603.6	Find the canal capacity, design the canal and compute the reservoir capacity.



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## DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2020-21

COURSE OUTCOMES (EVEN)

6<sup>th</sup> Semester

COURSE NAME: SOLID WASTE MANAGEMENT

COURSE CODE: 18CV642(C604)

COs	STATEMENTS
C604.1	Analyse existing solid waste management system and to identify their drawbacks.
C604.2	Evaluate different elements of solid waste management system.
C604.3	Suggest suitable scientific methods for solid waste management elements.
C604.4	Design suitable processing system and evaluate disposal sites.



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## DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2020-21

COURSE OUTCOMES (EVEN)

6<sup>th</sup> Semester

COURSE NAME: NON-CONVENTIONAL ENERGY SOURCES

COURSE CODE: 18ME651(C605)

COs	STATEMENTS
C605.1	Describe the environmental aspects of non-conventional energy resources. In Comparison with various conventional energy systems, their prospects and limitations.
C605.2	Know the need of renewable energy resources, historical and latest developments.
C605.3	Describe the use of solar energy and the various components used in the energy production with respect to applications like-heating, cooling, desalination, power generation, drying, cooking etc.
C605.4	Appreciate the need of Wind Energy and the various components used in energy generation and know the classifications.
C605.5	Understand the concept of Biomass energy resources and their classification, types of biogas Plants- applications
C605.6	Compare Solar, Wind and bio energy systems, their prospects, Advantages and limitations.
C605.7	Acquire the knowledge of fuel cells, wave power, tidal power and geothermal principles and applications





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**DEPARTMENT OF CIVIL ENGINEERING**

**ACADEMIC YEAR 2020-21**

**COURSE OUTCOMES (EVEN)**

**6<sup>th</sup> Semester**

**COURSE NAME: SOFTWARE APPLICATION LABORATORY**

**COURSE CODE: 18CVL66 (C606)**

COs	STATEMENTS
C606.1	use software skills in a professional set up to automate the work and thereby reduce cycle time for completion of the work



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## DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2020-21

COURSE OUTCOMES (EVEN)

6<sup>th</sup> Semester

COURSE NAME: ENVIRONMENTAL ENGINEERING LABORATORY

COURSE CODE: 18CVL67 (C607)

COs	STATEMENTS
C607.1	Acquire capability to conduct experiments and estimate the concentration of different parameters.
C607.2	Compare the result with standards and discuss based on the purpose of analysis.
C607.3	Determine type of treatment, degree of treatment for water and waste water.
C607.4	Identify the parameter to be analyzed for the student project work in environmental stream.



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## DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2020-21

COURSE OUTCOMES (EVEN)

6<sup>th</sup> Semester

COURSE NAME: EXTENSIVE SURVEY PROJECT

COURSE CODE: 18CVEP68 (C608)

COs	STATEMENTS
C608.1	Apply Surveying knowledge and tools effectively for the projects
C608.2	Understanding Task environment, Goals, responsibilities, Task focus, working in Teams towards common goals, Organizational performance expectations, technical and behavioral competencies.
C608.3	Application of individual effectiveness skills in team and organizational context, goal setting, time management, communication and presentation skills.
C608.4	Professional etiquettes at workplace, meeting and general
C608.5	Establishing trust-based relationships in teams & organizational environment
C608.6	Orientation towards conflicts in team and organizational environment, Understanding sources of conflicts, Conflict resolution styles and techniques



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## DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2020-21

COURSE OUTCOMES (EVEN)

4<sup>th</sup> Semester

COURSE NAME: COMPLEX ANALYSIS, PROBABILITY AND STATISTICAL METHODS

COURSE CODE: 18MAT41 (C401)

COs	STATEMENTS
C401.1	Use the concepts of analytic function and complex potentials to solve the problems arising in electromagnetic field theory.
C401.2	Utilize conformal transformation and complex integral arising in aerofoil theory, fluid flow visualization and image processing.
C401.3	Apply discrete and continuous probability distributions in analyzing the probability models arising in engineering field.
C401.4	Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data.
C401.5	Construct joint probability distributions and demonstrate the validity of testing the hypothesis.



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## DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2020-21

COURSE OUTCOMES (EVEN)

4<sup>th</sup> Semester

COURSE NAME: ANALYSIS OF DETERMINATE STRUCTURES

COURSE CODE: 18CV42 (C402)

COs	STATEMENTS
C402.1	Identify different forms of structural systems.
C402.2	Construct ILD and analyse the beams and trusses subjected to moving loads
C403.3	Understand the energy principles and energy theorems and its applications to determine the deflections of trusses and beams.
C404.4	Determine the stress resultants in arches and cables.



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## DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2020-21

COURSE OUTCOMES (EVEN)

4<sup>th</sup> Semester

COURSE NAME: APPLIED HYDRAULICS

COURSE CODE: 18CV43 (C403)

COs	STATEMENTS
C403.1	Apply dimensional analysis to develop mathematical modeling and compute the parametric values in prototype by analyzing the corresponding model parameters
C403.2	Design the open channels of various cross sections including economical channel sections
C403.3	Apply Energy concepts to flow in open channel sections, Calculate Energy dissipation,
C403.4	Compute water surface profiles at different conditions
C403.5	Design turbines for the given data, and to know their operation characteristics under different operating conditions



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## DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2020-21

COURSE OUTCOMES (EVEN)

4<sup>th</sup> Semester

COURSE NAME: CONCRETE TECHNOLOGY

COURSE CODE: 18CV44 (C404)

COs	STATEMENTS
C404.1	Relate material characteristics and their influence on microstructure of concrete.
C404.2	Distinguish concrete behavior based on its fresh and hardened properties.
C404.3	Illustrate proportioning of different types of concrete mixes for required fresh and hardened properties using professional codes.
C404.4	Adopt suitable concreting methods to place the concrete based on requirement.
C404.5	Select a suitable type of concrete based on specific application.



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## DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2020-21

COURSE OUTCOMES (EVEN)

4<sup>th</sup> Semester

COURSE NAME: ADVANCED SURVEYING

COURSE CODE: 18CV45 (C405)

COs	STATEMENTS
C405.1	Apply the knowledge of geometric principles to arrive at surveying problems
C405.2	Use modern instruments to obtain geo-spatial data and analyse the same to appropriate engineering problems.
C405.3	Capture geodetic data to process and perform analysis for survey problems with the use of electronic instruments
C405.4	Design and implement the different types of curves for deviating type of alignments.





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## DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2020-21

COURSE OUTCOMES (EVEN)

4<sup>th</sup> Semester

COURSE NAME: WATER SUPPLY AND TREATMENT ENGINEERING

COURSE CODE: 18CV46 (C406)

COs	STATEMENTS
C406.1	Estimate average and peak water demand for a community.
C406.2	Evaluate available sources of water, quantitatively and qualitatively and make appropriate choice for a community
C406.3	Evaluate water quality and environmental significance of various parameters and plan suitable treatment system.
C406.4	Design a comprehensive water treatment and distribution system to purify and distribute water to the required quality standards.



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## DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2020-21

COURSE OUTCOMES (EVEN)

4<sup>th</sup> Semester

**COURSE NAME: ENGINEERING GEOLOGY LABORATORY**

**COURSE CODE: 18CVL47 (C407)**

COs	STATEMENTS
C407.1	The students able to identify the minerals, rocks and utilize them effectively in civil engineering practices.
C407.2	The students will interpret and understand the geological conditions of the area for implementation of civil engineering projects.
C407.3	The students will interpret subsurface information such as thickness of soil, weathered zone, depth of hard rock and saturated zone by using geophysical methods.
C407.4	The students will learn the techniques in the interpretation of LANDSAT Imageries to find out the lineaments and other structural features for the given area.
C407.5	The students will be able to identify the different structures in the field.



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**DEPARTMENT OF CIVIL ENGINEERING**

**ACADEMIC YEAR 2020-21**

**COURSE OUTCOMES (EVEN)**

**4<sup>th</sup> Semester**

**COURSE NAME: FLUID MECHANICS AND HYDRAULIC MACHINES LABORATORY**

**COURSE CODE: 18CVL48 (C408)**

<b>COs</b>	<b>STATEMENTS</b>
C408.1	Properties of fluids and the use of various instruments for fluid flow measurement.
C408.2	Working of hydraulic machines under various conditions of working and their characteristics.



**Department of Computer Science and Engineering**

**2.6.1QIM Programme Outcomes (POs) and Course Outcomes (COs) offered by the department -  
EVEN Semester  
Academic Year 2020-2021**

SL NO	SEMESTER	SUBJECT/SUBJECT CODE
1	4	Complex Analysis, Probability and Statistical Methods(18MAT41)
2		Design and Analysis of Algorithms (18CS42)
3		Operating System(18CS43)
4		Microcontroller And Embedded Systems (18CS44)
5		Object Oriented Concepts(18CS45)
6		Data Communication(18CS46)
7		Design and Analysis of Algorithm Laboratory(18CSL47)
8		Microcontroller and Embedded Systems Laboratory(18CSL48)
9	6	System Software and Compilers (18CS61)
10		Computer Graphics and Visualization(18CS62)
11		Web Technology and its applications(18CS63)
12		Data Mining and Data Warehousing(18CS64)
13		Conservation Of Natural Resources (18ME651)
14		System Software Laboratory(18CSL66)
15		Computer Graphics Laboratory with Mini Project (18CSL67)
16		Mobile Application Development(18CSMP68)
17	8	Internet of things and applications (17CS81)
18		Big Data Analytics (17CS82)
19		Network Management(17CS833)



**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: 2020-21**

**EVEN SEMESTER-IV**

**Course Name: Complex Analysis, Probability and Statistical Methods**

**Course Code: 18MAT41/C401**

<b>Cos</b>	<b>Statements</b>
C401.1	Use the concepts of analytic function and complex potentials to solve the problems arising in electromagnetic field theory.
C401.2	Utilize conformal transformation and complex integral arising in aerofoil theory, fluid flow visualization and image processing.
C401.3	Apply discrete and continuous probability distributions in analyzing the probability models arising in engineering field.
C401.4	Apply greedy and input enhancement methods to solve graph & string based computational problems.
C401.5	Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data.
C401.6	Construct joint probability distributions and demonstrate the validity of testing the hypothesis.

**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



**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: 2020-21**

**EVEN SEMESTER-IV**

**Course Name: Design and Analysis of Algorithms**

**Course Code: 18CS42/C402**

<b>Cos</b>	<b>Statements</b>
C402.1	Describe computational solution to well known problems like searching, sorting etc.
C402.2	Estimate the computational complexity of different algorithms.
C402.3	Devise an algorithm using appropriate design strategies for problem solving.
C402.4	Apply appropriate method to solve a given problem.
C402.5	Describe various methods of algorithm analysis.

**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



## 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: 2020-21

### EVEN SEMESTER-IV

Course Name: Operating Systems

Course Code: 18CS43/C403

Cos	Statements
C403.1	Demonstrate need for OS and different types of OS
C403.2	Apply suitable techniques for management of different resources
C403.3	Use processor, memory, storage and file system commands
C403.4	Analyse various normalization forms for the given application.
C403.5	Realize the different concepts of OS in platform of usage through case studies

### 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



**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: 2020-21**

**EVEN SEMESTER-IV**

**Course Name: Microcontroller and Embedded Systems**

**Course Code 18CS44/C404**

<b>Cos</b>	<b>Statements</b>
C404.1	Describe the architectural features and instructions of ARM microcontroller
C404.2	Apply the knowledge gained for Programming ARM for different applications.
C404.3	Interface external devices and I/O with ARM microcontroller. Interpret the basic hardware components and their selection method based on the characteristics and attributes of an embedded system.
C404.4	Develop the hardware /software co-design and firmware design approaches.
C404.6	Demonstrate the need of real time operating system for embedded system applications

**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
CO2	1	1	1	1								2	1	1	2
CO3	2	2	3	2	2						1	1	2	2	2
CO4	2	2	1	2							1	1	2	2	2
CO5	2	2	2	1										1	1
AVG	1.6	1.6	1.6	1.4	2	0	0	0	0	0	1	1.3	1.5	1.4	1.6





## 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: 2020-21

### EVEN SEMESTER-IV

Course Name: Object Oriented Concepts

Course Code 18CS45/C405

Cos	Statements
C405.1	Explain the object-oriented concepts and JAVA.
C405.2	Develop computer programs to solve real world problems in Java.
C405.3	Set up Java JDK environment to create, debug and run simple Java programs .
C405.4	Create multi-threaded programs and event handling mechanisms.
C405.5	Develop simple GUI interfaces for a computer program to interact with users, and to understand the event-based GUI handling principles using swings.

### 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	1	3
CO2	1	1	2	1								2	1	2	2
CO3	1	1	2	1								2	1	1	2
CO4	1	1	1	1								2	1	2	1
CO5	1	1	1	2								3	1	2	3
AVG	1	1	1.6	1.2	0	0	0	0	0	0	0	2.4	1	1.6	2.2



**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: 2020-21**

**EVEN SEMESTER-IV**

**Course Name: Data Communication**

**Course Code 18CS46/C406**

<b>Cos</b>	<b>Statements</b>
C406.1	Explain the various components of data communication.
C406.2	Explain the fundamentals of digital communication and switching.
C406.3	Compare and contrast data link layer protocols.
C406.4	Demonstrate Medium Access Control protocols for reliable and noisy channels.
C406.5	Summarize IEEE 802.xx standards .

**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	1	1	3
CO2	3	1	1					1		1	1	2	1	2	2
CO3	3	2	1					1		1		2	1	1	2
CO4	3	1	1							1		2	1	2	1
CO5	2	1	1					1				3	1	2	3
AVG	1.8	1.2	1	0	0	0	2.8	1	0	1	1	2.4	1	1.6	2.2



**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: 2020-21**

**EVEN SEMESTER-IV**

**Course Name: Design and Analysis of Algorithm Laboratory**

**Course Code 18CSL47/C407**

<b>Cos</b>	<b>Statements</b>
C407.1	Design algorithms using appropriate design techniques (brute-force, greedy, dynamic programming, etc.)
C407.2	Implement a variety of algorithms such as sorting, graph related, combinatorial, etc., in a high level language.
C407.3	Analyze and compare the performance of algorithms using language features.
C407.4	Measure and compare the performance of different algorithms.
C407.5	Apply and implement learned algorithm design techniques and data structures to solve real-world problems.



**CITY**  
ENGINEERING COLLEGE

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: 2020-21**

**EVEN SEMESTER-IV**

**Course Name: Microcontroller and Embedded Systems Laboratory**

**Course Code 18CSL48/C408**

<b>Cos</b>	<b>Statements</b>
C408.1	Develop and test program using ARM7TDMI/LPC2148
C408.2	Conduct the following experiments on an ARM7TDMI/LPC2148 evaluation board using evaluation version of Embedded 'C' & Keil Uvision-4 tool/compiler.



**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: 2020-21**

**EVEN SEMESTER-VI**

**Course Name: SYSTEM SOFTWARE AND COMPILERS**

**Course Code: 18CS61 /C601**

<b>Cos</b>	<b>Statements</b>
C601.1	Explain system software
C601.2	Design and develop lexical analyzers, parsers and code generators
C601.3	Familiarize with source file, object file and executable file structures and libraries
C601.4	Describe the front-end and back-end phases of compiler and their importance to students
C601.5	Utilize lex and yacc tools for implementing different concepts of system software

**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	1	3
CO2	1	1	2	1								2	1	2	2
CO3	1	1	2	1								2	1	1	2
CO4	1	1	1	1								2	1	2	1
CO5	1	1	1	2								3	1	2	3
AVG	1	1	1.6	1.2	0	0	0	0	0	0	0	2.4	1	1.6	2.2



**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: 2020-21**

**EVEN SEMESTER-VI**

**Course Name: Computer Graphics and Visualization**

**Course Code: 81CS62 /C602**

<b>Cos</b>	<b>Statements</b>
C602.1	Design and implement algorithms for 2D graphics primitives and attributes.
C602.2	Construct geometric objects using Computer Graphics principles and OpenGL APIs
C602.3	Illustrate Geometric transformations on both 2D and 3D objects.
C602.4	Apply concepts of clipping and visible surface detection in 2D and 3D viewing, and Illumination Models.
C602.5	Decide suitable hardware and software for developing graphics packages using OpenGL.

**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	1	1	3
CO2	3	1	1					1		1	1	2	1	2	2
CO3	3	2	1					1		1		2	1	1	2
CO4	3	1	1							1		2	1	2	1
CO5	2	1	1					1				3	1	2	3
AVG	1.8	1.2	1	0	0	0	2.8	1	0	1	1	2.4	1	1.6	2.2



**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: 2020-21**

**EVEN SEMESTER-VI**

**Course Name: Web Technology and its applications**

**Course Code: 18CS63/C603**

<b>Cos</b>	<b>Statements</b>
C603.1	Adapt HTML and CSS syntax and semantics to build web pages.
C603.2	Construct and visually format tables and forms using HTML and CSS
C603.3	Develop Client-Side Scripts using JavaScript and Server-Side Scripts using PHP to generate and display the contents dynamically.
C603.4	Appraise the principles of object oriented development using PHP
C603.5	Inspect JavaScript frameworks like jQuery and Backbone which facilitates developer to focus on core features.

**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



**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: 2020-21**

**EVEN SEMESTER-VI**

**Course Name: Data Mining and Data Warehousing**

**Course Code: 18CS641 /C604**

<b>Cos</b>	<b>Statements</b>
C604.1	Identify data mining problems and implement the data warehouse
C604.2	Write association rules for a given data pattern.
C604.3	Explain rules related to association, classification and clustering analysis.
C604.4	Compare and contrast between different classification and clustering algorithms
C604.5	Choose between classification and clustering solution.

**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
CO2	1	1	1	1								2	1	1	2
CO3	2	2	3	2	2						1	1	2	2	2
CO4	2	2	1	2							1	1	2	2	2
CO5	2	2	2	1										1	1
AVG	1.6	1.6	1.6	1.4	2	0	0	0	0	0	1	1.3	1.5	1.4	1.6





**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: 2020-21**

**EVEN SEMESTER-VI**

**Course Name: CONSERVATION OF NATURAL RESOURCES**

**Course Code: 18ME651 /C605**

<b>Cos</b>	<b>Statements</b>
C605.1	Describe the environmental aspects of non-conventional energy resources. In Comparison with various conventional energy systems, their prospects and limitations.
C605.2	Know the need of renewable energy resources, historical and latest developments.
C605.3	Describe the use of solar energy and the various components used in the energy production with respect to applications like-heating, cooling, desalination, power generation, drying, cooking etc.
C605.4	Appreciate the need of Wind Energy and the various components used in energy generation and know the classifications.
C605.5	Understand the concept of Biomass energy resources and their classification, types of biogas Plants- applications



**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: 2020-21**

**EVEN SEMESTER-VI**

**Course Name: System Software Laboratory**

**Course Code: 18CSL66 /C606**

<b>Cos</b>	<b>Statements</b>
C606.1	To make students familiar with Lexical Analysis and Syntax Analysis phases of Compiler Design and implement programs on these phases using LEX & YACC tools and/or C/C++/Java
C606.2	To enable students to learn different types of CPU scheduling algorithms used in operating system.
C606.3	Implement and demonstrate Lexer"s and Parser"s .
C606.4	Evaluate different algorithms required for management, scheduling, allocation and communication used in operating system.



**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: 2020-21**

**EVEN SEMESTER-VI**

**Course Name: COMPUTER GRAPHICS LABORATORY WITH MINI PROJECT Course Code: 18CSL66 /C606**

<b>Cos</b>	<b>Statements</b>
C606.1	Apply the concepts of computer graphics
C606.2	Implement computer graphics applications using OpenGL
C606.3	Animate real world problems using OpenGL .



**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: 2020-21**

**EVEN SEMESTER-VI**

**Course Name: Mobile Application Development**

**Course Code: 18CSMP68 /C606**

<b>Cos</b>	<b>Statements</b>
C606.1	Create, test and debug Android application by setting up Android development environment
C606.2	Implement adaptive, responsive user interfaces that work across a wide range of devices.
C606.3	Infer long running tasks and background work in Android applications
C606.4	Demonstrate methods in storing, sharing and retrieving data in Android applications
C606.5	Describe the steps involved in publishing Android application to share with the world

**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



**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: 2020-21**

**EVEN SEMESTER-VII**

**Course Name: Internet of things and applications**

**Course Code: 17CS81/C801**

<b>Cos</b>	<b>Statements</b>
C801.1	Interpret the impact and challenges posed by IoT networks leading to new architectural models.
C801.2	Compare and contrast the deployment of smart objects and the technologies to connect them to network.
C801.3	Appraise the role of IoT protocols for efficient network communication.
C801.4	Elaborate the need for Data Analytics and Security in IoT
C801.5	Illustrate different sensor technologies for sensing real world entities and identify the applications of IoT in Industry.

**CO PO Mapping**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	1	1								2	3	1	3
CO2	2	1	3	3	2	2			2	1		3	3	2	1
CO3	2	1	2	1	1	2			2	2		2	3	3	1
CO4	3	1	1	2	1	1			1	3		2	3	1	1
CO5	1	1	1	13	1	1			1	1	3	3	3	1	3
AVG	2.2	1	1.6	4	1.2	1.5	0	0	1.5	1.7	3	2.4	3	1.6	1.8



**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: 2020-21**

**EVEN SEMESTER-VII**

**Course Name: Big Data Analytics**

**Course Code: 17CS82/C802**

<b>Cos</b>	<b>Statements</b>
C802.1	Understand fundamentals of Big Data analytics.
C802.2	Investigate Hadoop framework and Hadoop Distributed File system.
C803.3	Illustrate the concepts of NoSQL using MongoDB and Cassandra for Big Data.
C804.4	Demonstrate the MapReduce programming model to process the big data along with Hadoop tools.
C805.5	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	1	1	1	1									1	1	1
CO2	1	1	1	1								2	1	1	2
CO3	2	2	3	2	2						1	1	2	2	2
CO4	2	2	1	2							1	1	2	2	2
CO5	2	2	2	1										1	1
AVG	1.6	1.6	1.6	1.4	2	0	0	0	0	0	1	1.3	1.5	1.4	1.6



**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: 2020-21**

**EVEN SEMESTER-VII**

**Course Name: Network Management**

**Course Code: 17CS833/C802**

<b>Cos</b>	<b>Statements</b>
C803.1	Analyze the issues and challenges pertaining to management of emerging network technologies such as wired/wireless networks and high-speed internets.
C803.2	Apply network management standards to manage practical networks
C803.3	Formulate possible approaches for managing OSI network model.
C803.4	Use on SNMP for managing the network. Use RMON for monitoring the behavior of the network
C803.5	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	1	1	2	1						3	1	1	3
CO2	1	3	1	1	2					1		2	1	2	2
CO3	1	2	1	1	2					1	1	2	1	1	2
CO4	1	3		1	1					3	3	2	1	1	1
CO5	1	2		1	1							3	1	2	3
AVG	1	2.2	1	1	1.6	1	0	0	0	1.6	2	2.4	1	1.4	2.2











































**CITY**  
ENGINEERING COLLEGE

**Department of Mechanical Engineering**

**ACADEMIC YEAR 2020-2021**

**Course Outcomes**

<b>Subject: APPLIED THERMODYNAMICS</b>		<b>Subject Code:18ME42</b>
<b>Course Outcomes</b>		
<b>CO1</b>	Apply thermodynamic concepts to analyze the performance of gas power cycles.	
<b>CO2</b>	Apply thermodynamic concepts to analyze the performance of vapour power cycles.	
<b>CO3</b>	Understand combustion of fuels and performance of I C engines.	
<b>CO4</b>	Apply Thermodynamic concepts to determine performance parameters of refrigeration and air-conditioning systems.	
<b>CO5</b>	Understand the working principle of Air compressors and Steam nozzles, applications, relevance of air and identify methods for performance improvement	

<b>Subject: FLUID MECHANICS</b>		<b>Subject Code:18ME43</b>
<b>Course Outcomes</b>		
<b>CO1</b>	Identify and calculate the key fluid properties used in the analysis of fluid behavior. Explain the principles of pressure, buoyancy and floatation	
<b>CO2</b>	Apply the knowledge of fluid statics, kinematics and dynamics while addressing problems mechanical and chemical engineering.	
<b>CO3</b>	Describe the principles of fluid kinematics and dynamics.	
<b>CO4</b>	Explain the concept of boundary layer in fluid flow and apply dimensional analysis to for dimensionless numbers in terms of input output variables.	
<b>CO5</b>	Illustrate and explain the basic concept of compressible flow and CFD	

<b>Subject: KINEMATICS OF MACHINES</b>		<b>Subject Code:18ME44</b>
<b>Course Outcomes</b>		
<b>CO1</b>	Identify the kinematic link, kinematic pairs, chains, mechanisms, mobility, and inversions.	
<b>CO2</b>	Determine the velocities and accelerations of linkages and joints of mechanisms graphical method.	
<b>CO3</b>	Apply the Freudenstein's equation to determine the velocities and accelerations by analytical method for slider crank mechanism and other applications.	
<b>CO4</b>	Analyse different cams and sketch the cam profiles for various motions of the follower, motion characteristics.	
<b>CO5</b>	Evaluate the velocity ratio and torque in various types of gear trains.	



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<b>Subject:</b> METAL CASTING AND WELDING		<b>Subject Code:</b> 18ME45B
<b>Course Outcomes</b>		
<b>CO1</b>	Describe the casting process and prepare different types of cast products.	
<b>CO2</b>	Compare the Gas fired pit, Resistance, Coreless, Electrical and Cupola Metal Furnaces.	
<b>CO3</b>	Understand the Solidification process and Casting of Non-Ferrous Metals	
<b>CO4</b>	Describe the Metal Arc, TIG, MIG, Submerged and Atomic Hydrogen Welding processes etc. used in manufacturing	
<b>CO5</b>	Describe methods for the quality assurance of components made of casting and joining process	

<b>Subject:</b> MECHANICAL MEASUREMENTS AND METROLOGY		<b>Subject Code:</b> 18ME46B
<b>Course Outcomes</b>		
<b>CO1</b>	Understand the objectives of metrology, methods of measurement, standards of measurement & various measurement parameters	
<b>CO2</b>	Understand limits, fits and tolerance and the working of comparators	
<b>CO3</b>	Describe measurement of major & minor diameter, pitch, angle and effective diameter of screw threads and gears	
<b>CO4</b>	Explain measurement systems, transducers, intermediate modifying devices and terminating devices	
<b>CO5</b>	Understand the measurement of force, Torque and Pressure	

<b>Subject:</b> MECHANICAL MEASUREMENTS AND METROLOGY LAB		<b>Subject Code:</b> 18MEL47B
<b>Course Outcomes</b>		
<b>CO1</b>	Understand the Calibration of pressure gauge, thermocouple, LVDT, load cell, micrometer	
<b>CO2</b>	Apply concepts of Measurement of angle using Sine Centre/ Sine Bar/ Bevel Protractor, alignment using Autocollimator/ Roller set	
<b>CO3</b>	Demonstrate measurements using Optical Projector/Tool maker microscope, Optical flats and mechanical comparator	
<b>CO4</b>	Determine the screw thread parameters using gear tooth profile using gear tooth Vernier/Gear tooth micrometer	
<b>CO5</b>	Analyse tool forces using Lathe/Drill tool dynamometer	

<b>Subject:</b> FOUNDRY, FORGING AND WELDING LAB		<b>Subject Code:</b> 18MEL48B
<b>Course Outcomes</b>		
<b>CO1</b>	Identify the properties of moulding sand (Tension,compression,shear&permeability)	
<b>CO2</b>	Build sand moulds using hand tools ,patterns and cores	
<b>CO3</b>	Estimate the raw material required for change of cross section and dimensions.	
<b>CO4</b>	Demonstrate the forging operations	



<b>Subject:</b> FINITE ELEMENT METHODS		<b>Subject Code:</b> 18ME61
<b>Course Outcomes</b>		
<b>CO1</b>	Identify the application and characteristics of FEA elements such as bars, beams, plane and iso-parametric elements.	
<b>CO2</b>	Develop element characteristic equation and generation of global equation.	
<b>CO3</b>	Formulate and solve Axi-symmetric and heat transfer problems	
<b>CO4</b>	Apply suitable boundary conditions to a global equation for bars, trusses, beams, circular shafts, heat transfer, fluid flow, axi-symmetric and dynamic problems	
<b>CO5</b>	Solve for field variables in heat transfer , fluid flow problems, axi-symmetric and dynamic problems	

<b>Subject:</b> DESIGN OF MACHINE ELEMENTS II		<b>Subject Code:</b> 18ME62
<b>Course Outcomes</b>		
<b>CO1</b>	Apply design principles for the design of mechanical system involving springs, belts, pulleys and wire ropes	
<b>CO2</b>	Design different types of gears and simple gear boxes for relevant applications	
<b>CO3</b>	Understand the design principles of brakes and clutches	
<b>CO4</b>	Apply design concepts of hydrodynamics bearings for different applications and select anti friction bearings for different applications using the manufacturers, catalogue	
<b>CO5</b>	Apply the engineering design tools to product design	

<b>Subject:</b> Heat transfer		<b>Subject Code:</b> 18ME63
<b>Course Outcomes</b>		
<b>CO1</b>	Understand the modes of heat transfer and apply the basic laws to formulate engineering systems.	
<b>CO2</b>	Understand and apply the basic laws of heat transfer to extended surface, composite material and unsteady state heat transfer problems	
<b>CO3</b>	Analyze heat conduction through numerical methods and apply the fundamental principle to solve radiation heat transfer problems.	
<b>CO4</b>	Analyze heat transfer due to free and forced convective heat transfer.	
<b>CO5</b>	Understand the design and performance analysis of heat exchangers and their practical applications, Condensation and Boiling phenomena	

<b>Subject:</b> NON-TRADITIONAL MACHINING		<b>Subject Code:</b> 18ME641
<b>Course Outcomes</b>		
<b>CO1</b>	Understand the compare traditional and non-traditional machining process and recognize the need for Non- traditional machining process.	
<b>CO2</b>	Understand the constructional features, performance parameters, process characteristics, applications, advantages and limitations of USM, AJM and WJM	
<b>CO3</b>	Identify the need of Chemical and electro-chemical machining process along with the constructional features, process parameters, process characteristics, applications, advantages and limitations.	
<b>CO4</b>	Understand the constructional feature of the equipment, process parameters, process characteristics, applications, advantages and limitations EDM & PAM.	
<b>CO5</b>	Understand the LBM equipment, LBM parameters, and characteristics. EBM equipment and mechanism of metal removal, applications, advantages and limitations LBM & EBM	



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<b>Subject:</b> NON-CONVENTIONAL ENERGY SOURCES		<b>Subject Code:</b> 18ME651
<b>Course Outcomes</b>		
<b>CO1</b>	To introduce the concepts of solar energy, its radiation, collection, storage and application.	
<b>CO2</b>	To introduce the concepts and applications of Wind energy, Biomass energy, Geothermal energy and Ocean energy as alternative energy sources.	
<b>CO3</b>	To explore society's present needs and future energy demands	
<b>CO4</b>	To examine energy sources and conversion of energy including non-renewable ,renewable energy sources into useful energy .	
<b>CO5</b>	To get exposed to energy conservation methods	

<b>Subject:</b> COMPUTER AIDED MODELLING AND ANALYSIS LAB		<b>Subject Code:</b> 18MEL66
<b>Course Outcomes</b>		
<b>CO1</b>	Analyze the structural members like bars, trusses, and beams for different loads.	
<b>CO2</b>	Determine the stresses in plates under plane stress conditions.	
<b>CO3</b>	Solve for temperature distribution in 1D and 2D members under conduction and convection heat transfer.	
<b>CO4</b>	Analyze bars and beams for dynamic response	

<b>Subject:</b> HEAT TRANSFER LAB		<b>Subject Code:</b> 18MEL67
<b>Course Outcomes</b>		
<b>CO1</b>	Perform experiments to determine the thermal conductivity of a metal rod and emissivity of a test plate	
<b>CO2</b>	Estimate the effective thermal resistance in composite slabs and efficiency in pin-fin	
<b>CO3</b>	Conduct experiments to determine convective heat transfer coefficient for free and forced convection and correlate with theoretical values	
<b>CO4</b>	Determine Boiling of Liquid and Condensation of Vapour and Estimate the performance of a refrigerator	
<b>CO5</b>	Calculate temperature distribution of study and transient heat conduction through a plane wall, cylinder and fin	

<b>Subject:</b> MINI-PROJECT		<b>Subject Code:</b> 18MEM68
<b>Course Outcomes</b>		
<b>CO1</b>	Practice acquired knowledge within the chosen area of technology for project development.	
<b>CO2</b>	Identify, discuss and justify the technical aspects of the chosen project with a comprehensive and systematic approach.	
<b>CO3</b>	Reproduce, improve and refine technical aspects for engineering projects by applying the knowledge of design/solve complex engineering problems by the usage of modern tools.	
<b>CO4</b>	Work as an individual or in a team in development of technical projects.	
<b>CO5</b>	Communicate and report effectively project related activities and findings.	



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<b>Subject: OPERATIONS RESEARCH</b>		<b>Subject Code:17ME81</b>
<b>Course Outcomes</b>		
<b>CO1</b>	Apply the significance of Operations Research in decision making and identify and develop mathematical model from verbal description of real system problems	
<b>CO2</b>	Obtain the solution of formulated real life problem with its inherent resources and constraints	
<b>CO3</b>	Recognize and formulate a transportation and assignment model and obtain optimal solution with all the variants of models.	
<b>CO4</b>	Construct network diagram and determine critical path, floats for deterministic and PERT networks including crashing of networks and waiting line problems for M/M/1 and M/M/K queuing theory	
<b>CO5</b>	Solve problems on game theory for pure and mixed strategy under competitive environment and also Determine minimum processing times for sequencing of n jobs-2 machines, n jobs-3machines,n jobs-m machinesand 2 jobs-n machines using Johnsons algorithm	

<b>Subject: ADDITIVE MANUFACTURING</b>		<b>Subject Code:17ME82</b>
<b>Course Outcomes</b>		
<b>CO1</b>	Apply the knowledge of Additive Manufacturing and Rapid Prototyping technologies	
<b>CO2</b>	Choose various nanomaterial's production techniques	
<b>CO3</b>	Develop NC machine program	
<b>CO4</b>	Automate the process by analyzing the required type of Pneumatic and hydraulics Systems in various application areas	
<b>CO5</b>	Decide the types of Industrial controls required, Employ various material characterization technique	

<b>Subject: PRODUCT LIFE CYCLE MANAGEMENT</b>		<b>Subject Code:17ME835</b>
<b>Course Outcomes</b>		
<b>CO1</b>	Point out the Components, Phases, Characteristics, and Opportunities, benefits, Views, feasibility, vision and Drivers of PLM.	
<b>CO2</b>	Choose Conceptualization, Design, Development, Validation, Production, implementation of PLM and PDM.	
<b>CO3</b>	Calculate the Engineering prototype development, design for environment, virtual testing, validation and Creation of animation using CAD software	
<b>CO4</b>	Analyze the parameterization of design, optimization of products, Digital manufacturing, virtual learning curve, production planning.	
<b>CO5</b>	Evaluate the PLM strategy, PLM initiatives to support corporate objectives Infrastructure assessment, assessment of current systems and applications.	



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<b>Subject: INTERNSHIP</b>		<b>Subject Code:17ME84</b>
<b>Course Outcomes</b>		
<b>CO1</b>	Apply modern techniques, resources, engineering and IT tools while addressing complex engineering problems.	
<b>CO2</b>	Demonstrate the contextual knowledge to access societal, health, safety and cultural issues normally encountered in industries.	
<b>CO3</b>	Contribute through engineering solutions for the sustainable development in societal and environmental context and exercise professional ethics, norms, standards and responsibilities in engineering practice.	
<b>CO4</b>	Effectively work as a team member as well as a leader while demonstrating the knowledge of project management, finance handling and other management practices in multidisciplinary environment.	
<b>CO5</b>	Demonstrate the knowledge of documentation, report writing, effective presentation, receiving and delivering clear instructions in the professional environment and recognize the need & have preparation ability to engage in independent & life-long learning facing the challenges of technological changes.	

<b>Subject: PROJECT PHASE II</b>		<b>Subject Code:17ME85</b>
<b>Course Outcomes</b>		
<b>CO1</b>	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	
<b>CO2</b>	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.	
<b>CO3</b>	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.	
<b>CO4</b>	Form internal & external group to work together as a team in the project under consideration under multi disciplinary settings.	
<b>CO5</b>	Communicate effectively addressing the complex engineering activities with documentation reports and proper presentation tools.	

<b>Subject: SEMINAR</b>		<b>Subject Code:17MES86</b>
<b>Course Outcomes</b>		
<b>CO1</b>	Reviewing of advanced or recent technologies in the field of mechanical engineering	
<b>CO2</b>	Investigate and study the literature of recent technologies from various sources	
<b>CO3</b>	Skill to write detailed technical report describing the gained knowledge.	
<b>CO4</b>	Enhances the effective communication and presentation skill.	



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## Department of Basic Science

### 2.6.1 QIM Programme Outcomes (POs) and Course Outcomes (COs) offered by the department (EVEN and ODD) ACY 2020-2021

#### I YEAR COURSES

Sl. No	Course Name	Course Code
1	Calculus and Linear Algebra	18MAT11
2	Engineering Physics	18PHY12/22
3	Basic Electrical Engineering	18ELE13/23
4	Elements of Civil Engineering and Mechanics	18CIV14/24
5	Engineering Graphics	18EGDL15/25
6	Engineering Physics laboratory	18PHYL16/26
7	Basic Electrical and Engineering laboratory	18ELEL17/27
8	Technical English-I	18EGH18
9	Engineering Chemistry	18CHE12/22
10	C programming for problem Solving	18CPS13/23
11	Basic Electronics	18ELN14/24
12	Elements of Mechanical Engineering	18ME15/25
13	Engineering Chemistry Laboratory	18CHEL16/26
14	Advanced Calculus and Numerical Methods	18MAT21
15	Technical English II	18EGH28



HOD



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**DEPARTMENT OF BASIC SCIENCE**

**ACADEMIC YEAR 2020-21**

**COURSE OUTCOMES OF I YEAR**

**COURSE NAME: CALCULUS AND LINEAR ALGEBRA**

**COURSE CODE: 18MAT11 [C101]**

<b>COs</b>	<b>STATEMENTS</b>
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 rates of change of multivariate functions and solve problems related to composite functions and Jacobians
C101.3	Apply the concept of change of order of integration and variables to evaluate multiple integrals and their usage in computing the area and volumes
C101.4	Solve first order linear/nonlinear differential equation analytically using standard methods
C101.5	Make use of matrix theory for solving system of linear equations and compute eigen values and eigenvectors required for matrix diagonalization process

**CO-PO-PSO Mapping:**

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







**COURSE NAME: Basic Electrical Engineering**

**COURSE CODE: 18ELE13/23 [C103]**

<b>COs</b>	<b>STATEMENTS</b>
C103.1	Analyse D.C and A.C circuits.
C103.2	Explain the principle of operation and construction of single-phase transformers
C103.3	Explain the principle of operation and construction of DC machines and synchronous machines.
C103.4	Explain the principle of operation and construction of three phase induction motors.
C103.5	Discuss concepts of electrical wiring, circuit protecting devices and earthing.

**CO-PO-PSO Mapping:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C103.1	3	2													
C103.2	3	2													
C103.3	3	2													
C103.4	3	2											1		
C103.5	2					2		2					1		



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**COURSE NAME: Elements of Civil Engineering and Mechanics**  
**COURSE CODE: 18CIV14/24 [C104]**

<b>COs</b>	<b>STATEMENTS</b>
C104.1	Mention the applications of various fields of Civil Engineering.
C104.2	Compute the resultant of given force system subjected to various loads.
C104.3	Comprehend the action of Forces, Moments and other loads on systems of rigid bodies and compute their active forces that develop as a result of the external loads.
C104.4	Locate the Centroid and compute the Moment of Inertia of regular and built-up sections.
C104.5	Express the relationship between the motion of bodies and analyze the bodies in motion.

**CO-PO-PSO Mapping:**

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



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**COURSE NAME: Engineering Graphics**

**COURSE CODE: 18EGDL15/25 [C105]**

COs	STATEMENTS
C105.1	Prepare engineering drawings as per BIS conventions mentioned in the relevant codes.
C105.2	Produce computer generated drawings using CAD software.
C105.3	Use the knowledge of orthographic projections to represent engineering information/concepts and present the same in the form of drawings.
C105.4	Develop isometric drawings of simple objects reading the orthographic projections of those objects.
C105.5	Convert pictorial and isometric views of simple objects to orthographic views.

**CO-PO-PSO Mapping:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C105.1	3	3			3							1	2	1	
C105.2	3	3			3							1	2		
C105.3	3	3			3							1	2	1	
C105.4	3	3			3							1	2		
C105.5	3	3			3							1	2	1	





**COURSE NAME: Basic Electrical and Engineering laboratory**

**COURSE CODE: 18ELEL17/27 [C107]**

<b>COs</b>	<b>STATEMENTS</b>
C107.1	Identify the common electrical components and measuring instruments used for conducting experiments in the electrical laboratory.
C107.2	Compare power factor of lamps.
C107.3	Determine impedance of an electrical circuit and power consumed in a 3-phase load.
C107.4	Determine earth resistance and understand two way and three-way control of lamps.

**CO-PO-PSO Mapping:**

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



**COURSE NAME: Technical English-I**

**COURSE CODE: 18EGH18 [C108]**

<b>COs</b>	<b>STATEMENTS</b>
C108.1	Use grammatical English and essentials of language skills and identify the nuances of phonetics, intonation and flawless pronunciation
C108.2	Implement English vocabulary at command and language proficiency
C108.3	Identify common errors in spoken and written communication
C108.4	Understand and improve the nonverbal communication and kinesics
C108.5	Perform well in campus recruitment, engineering and all other general competitive examinations

**CO-PO-PSO Mapping:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C108.1										2		1		1	
C108.2										2		1		1	
C108.3										2		1			
C108.4										2		1			
C108.5										2		1		1	2



**Course Name: Engineering Chemistry**  
**COURSE CODE: 18CHE12/22 [C109]**

COs	STATEMENTS
C109.1	Use of free energy in equilibrium, rationalize bulk properties and processes using thermodynamic considerations, electrochemical energy systems.
C109.2	Causes & effects of corrosion of metals and control of corrosion. Modification of surface properties of metals to develop resistance to corrosion, wear, tear, impact etc. by electroplating and electroless plating
C109.3	Production & consumption of energy for industrialization of country and living standards of people. Electrochemical and concentration cells. Classical, modern batteries and fuel cells. Utilization of solar energy for different useful forms of energy.
C109.4	Environmental pollution, waste management and water chemistry.
C109.5	Different techniques of instrumental methods of analysis. Fundamental principles of nano materials.

**CO-PO-PSO Mapping:**

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





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**Course Name: C programming for problem Solving**

**COURSE CODE: 18CPS13/23 [C110]**

COs	STATEMENTS
C110.1	Illustrate simple algorithms from the different domain such as mathematics, physics etc
C110.2	Construct a programming solution to the given problem using C
C110.3	Identify and correct the syntax and logical errors in C programs.
C110.4	Modularize the given problem using functions and structures.
C110.5	Understand the basic concept of recursion and pre-processor directives.

**CO-PO-PSO Mapping:**

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



**Course Name: Basic Electronics**  
**COURSE CODE: 18ELN14/24 [C111]**

COs	STATEMENTS
C111.1	Describe the operation of diodes, BJT, FET and Operational Amplifiers.
C111.2	Design and explain the construction of rectifiers, regulators, amplifiers and oscillators
C111.3	Describe general operating principles of SCRs and its application.
C111.4	Explain the working and design of Fixed voltage IC regulator using 7805 and Astable oscillator using Timer IC555.
C111.5	Explain the different number system and their conversions and construct simple combinational and sequential logic circuits using Flip-Flops.
C111.6	Describe the basic principle of operation of communication system and mobile phones.

**CO-PO-PSO Mapping:**

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



**Course Name: Elements of Mechanical Engineering**

**COURSE CODE: 18ME15/25 [C112]**

COs	STATEMENTS
C112.1	Identify different sources of energy and their conversion process.
C112.2	Explain the working principle of hydraulic turbines, pumps, IC engines and refrigeration
C112.3	Recognize various metal joining processes and power transmission elements
C112.4	Understand the properties of common engineering materials and their applications in engineering industry.
C112.5	Discuss the working of conventional machine tools, machining processes, tools and accessories.
C112.6	Describe the advanced manufacturing systems.

**CO-PO-PSO Mapping:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C112.1	2						2					2	1		
C112.2	2											2	2	1	
C112.3	2	2	1				2					2	1		
C112.4	2	2										1			
C112.5	2				2							2	1		



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**Course Name: Engineering Chemistry Laboratory**

**COURSE CODE: 18CHEL16/26 [C113]**

<b>COs</b>	<b>STATEMENTS</b>
C113.1	Handling different types of instruments for analysis of materials using small quantities of materials involved for quick and accurate results.
C113.2	Carrying out different types of titrations for estimation of concerned in materials using comparatively more quantities of materials involved for good results

**CO-PO-PSO Mapping:**

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



**Course Name: Advanced Calculus and Numerical Methods**

**COURSE CODE: 18MAT21 [C201]**

COs	STATEMENTS
C201.1	Illustrate the applications of multivariate calculus to understand the solenoidal and irrotational vectors and also exhibit the interdependence of line, surface and volume integrals.
C201.2	Demonstrate various physical models through higher order differential equations and solve such linear ordinary differential equations.
C201.3	Construct a variety of partial differential equations and solution by exact methods/method of separation of variables.
C201.4	Explain the applications of infinite series and obtain series solution of ordinary differential equations
C201.5	Apply the knowledge of numerical methods in the modelling of various physical and engineering phenomena.

**CO-PO-PSO Mapping:**

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



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**Course Name: Technical English II**  
**COURSE CODE: 18EGH28 [C202]**

<b>COs</b>	<b>STATEMENTS</b>
C202.1	Identify common errors in spoken and written communication
C202.2	Get familiarized with English vocabulary and language proficiency
C202.3	Improve nature and style of sensible writing and acquire employment and workplace communication skills
C202.4	Improve their Technical Communication Skills through Technical Reading and Writing practices
C202.5	Perform well in campus recruitment, engineering and all other general competitive examinations

**CO-PO-PSO Mapping:**

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