Doddakallasandra, Bangalore-560061

DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2019-20

COURSE OUTCOMES (ODD)

7th Semester

COURSE NAME: MUNICIPAL AND INDUSTRIAL WASTE WATER ENGINEERING

COURSE CODE: 15CV71(C701)

COs	STATEMENTS
C701.1	Acquires capability to design sewer and Sewerage treatment plant.
C701.2	Evaluate degree of treatment and type of treatment for disposal, reuse and recycle.
C701.3	Identify waste streams and design the industrial waste water treatment plant.
C701.4	Manage sewage and industrial effluent issues.

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DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2019-20

COURSE OUTCOMES (ODD)

7th Semester

COURSE NAME: DESIGN OF RCC AND STEEL STRUCTURES

COURSE CODE: 15CV72(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 2019-20

COURSE OUTCOMES (ODD)

7th Semester

COURSE NAME: HYDROLOGY AND IRRIGATION ENGINEERING

COURSE CODE: 15CV73(C703)

COs	STATEMENTS
C703.1	Understand the importance of hydrology and its components.
C703.2	Measure precipitation and analyze the data and analyze the losses in precipitation.
C703.3	Estimate runoff and develop unit hydrographs.
C703.4	Find the benefits and ill-effects of irrigation.
C703.5	Find the quantity of irrigation water and frequency of irrigation for various crops.
C703.6	Find the canal capacity, design the canal and compute the reservoir capacity.

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DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2019-20

COURSE OUTCOMES (ODD)

7th Semester

COURSE NAME: DESIGN CONCEPT OF BUILDING SERVICES

COURSE CODE: 15CV743(C704)

COs	STATEMENTS
C704.1	Describe the basics of house plumbing and waste water collection and disposal.
C704.2	Discuss the safety and guidelines with respect to fire safety.
C704.3	Describe the issues with respect to quantity of water, rain water harvesting and roof top harvesting.
C704.4	Understand and implement the requirements of thermal comfort in buildings

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DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2019-20

COURSE OUTCOMES (ODD)

7th Semester

COURSE NAME: URBAN TRANSPORTATION AND PLANNING

COURSE CODE: 15CV751 (C705)

COs	STATEMENTS
C705.1	Design, conduct and administer surveys to provide the data required for transportation planning.
C705.2	Supervise the process of data collection about travel behavior and analyze the data for use in transport planning.
C705.3	Develop and calibrate modal split, trip generation rates for specific types of land use developments.
C705.4	Adopt the steps that are necessary to complete a long-term transportation plan.

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DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2019-20

COURSE OUTCOMES (ODD)

7th Semester

COURSE NAME: ENVIRONMENTAL ENGINEERING LABORATORY

COURSE CODE: 15CVL76 (C706)

COs	STATEMENTS
C706.1	Acquire capability to conduct experiments and estimate the concentration of different parameters.
C706.2	Compare the result with standards and discuss based on the purpose of analysis.
C706.3	Determine type of treatment, degree of treatment for water and waste water.
C706.4	Identify the parameter to be analyzed for the student project work in environmental stream.

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DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2019-20

COURSE OUTCOMES (ODD)

7th Semester

COURSE NAME: COMPUTER AIDED DETAILING OF STRUCTURES

COURSE CODE: 15CVL77(C707)

COs	STATEMENTS
C707.1	Prepare detailed working drawings

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DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2019-20

COURSE OUTCOMES (ODD)

5th Semester

COURSE NAME: DESIGN OF RC STRUCTURAL ELEMENTS

COURSE CODE: 17CV51 (C501)

COs	STATEMENTS
C501.1	understand the design philosophy and principles
C501.2	solve engineering problems of RC elements subjected to flexure, shear and torsion
C501.3	demonstrate the procedural knowledge in designs of RC structural elements such as slabs, columns and footings
C501.4	owns professional and ethical responsibility

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DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2019-20

COURSE OUTCOMES (ODD)

5th Semester

COURSE NAME: ANALYSIS OF INDETERMINATE STRUCTURES

COURSE CODE: 17CV52 (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 2019-20

COURSE OUTCOMES (ODD)

5th Semester

COURSE NAME: APPLIED GEOTECHNICAL ENGINEERING

COURSE CODE: 17CV53 (C503)

COs	STATEMENTS
C503.1	Ability to plan and execute geotechnical site investigation program for different civil engineering projects
C503.2	Understanding of stress distribution and resulting settlement beneath the loaded footings on sand and clayey soils
C503.3	Ability to estimate factor of safety against failure of slopes and to compute lateral pressure distribution behind earth retaining structures
C503.4	Ability to determine bearing capacity of soil and achieve proficiency in proportioning shallow isolated and combined footings for uniform bearing pressure
C503.5	Capable of estimating load carrying capacity of single and group of piles

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ACADEMIC YEAR 2019-20

COURSE OUTCOMES (ODD)

5th Semester

COURSE NAME: COMPUTER AIDED BUILDING PLANNING AND DRAWING
COURSE CODE: 17CV54 (C504)

COs	STATEMENTS
C504.1	Gain a broad understanding of planning and designing of buildings
C504.2	Prepare, read and interpret the drawings in a professional set up.
C504.3	Know the procedures of submission of drawings and Develop working and submission drawings for building
C504.4	Plan and design a residential or public building as per the given requirements

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ACADEMIC YEAR 2019-20

COURSE OUTCOMES (ODD)

5th Semester

COURSE NAME: AIR POLLUTION AND CONTROL
COURSE CODE: 17CV551 (C505)

COs	STATEMENTS
C505.1	Identify the major sources of air pollution and understand their effects on health and environment.
C505.2	Evaluate the dispersion of air pollutants in the atmosphere and to develop air quality models.
C505.3	Ascertain and evaluate sampling techniques for atmospheric and stack pollutants.
C505.4	Choose and design control techniques for particulate and gaseous emissions.

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ACADEMIC YEAR 2019-20

COURSE OUTCOMES (ODD)

5th Semester

COURSE NAME: TAFFIC ENGINEERING
COURSE CODE: 17CV561 (C506)

COs	STATEMENTS
C506.1	Understand the human factors and vehicular factors in traffic engineering design.
C506.2	Conduct different types of traffic surveys and analysis of collected data using statistical concepts.
C506.3	Use an appropriate traffic flow theory and to comprehend the capacity & signalized intersection analysis.
C506.4	Understand the basic knowledge of Intelligent Transportation System.

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ACADEMIC YEAR 2019-20

COURSE OUTCOMES (ODD)

5th Semester

COURSE NAME: GEOTECHNICAL ENGINEERING LAB
COURSE CODE: 17CVL57 (C507)

COs	STATEMENTS
C507.1	Physical and index properties of the soil
C507.2	Classify based on index properties and field identification
C507.3	To determine OMC and MDD, plan and assess field compaction program
C507.4	Shear strength and consolidation parameters to assess strength and deformation characteristics
C507.5	In-situ shear strength characteristics (SPT- Demonstration)

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ACADEMIC YEAR 2019-20

COURSE OUTCOMES (ODD)

5th Semester

COURSE NAME: CONCRETE AND HIGHWAY MATERIALS LABORATORY
COURSE CODE: 17CVL58 (C508)

COs	STATEMENTS
C508.1	Conduct appropriate laboratory experiments and interpret the results
C508.2	Determine the quality and suitability of cement.
C508.3	Design appropriate concrete mix
C508.4	Determine strength and quality of concrete.
C508.5	Test the road aggregates and bitumen for their suitability as road material.
C508.6	Test the soil for its suitability as sub grade soil for pavements.

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ACADEMIC YEAR 2019-20

COURSE OUTCOMES (ODD)

3rd Semester

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 functional using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis.

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ACADEMIC YEAR 2019-20

COURSE OUTCOMES (ODD)

3rd Semester

COURSE NAME: STRENGTH OF MATERIALS

COURSE CODE: 18CV32 (C302)

COs	STATEMENTS
C302.1	To evaluate the basic concepts of the stresses and strains for different materials and strength of structural elements.
C302.2	To evaluate the development of internal forces and resistance mechanism for one dimensional and two-dimensional structural elements.
C302.3	To analyse different internal forces and stresses induced due to representative loads on structural elements.
C302.4	To evaluate slope and deflections of beams.
C302.5	To evaluate the behaviour of torsion members, columns and struts.

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ACADEMIC YEAR 2019-20

COURSE OUTCOMES (ODD)

3rd Semester

COURSE NAME: FLUIDS MECHANICS

COURSE CODE: 18CV33 (C303)

COs	STATEMENTS
C303.1	Possess a sound knowledge of fundamental properties of fluids and fluid Continuum
C303.2	Compute and solve problems on hydrostatics, including practical applications
C303.3	Apply principles of mathematics to represent kinematic concepts related to fluid flow
C303.4	Apply fundamental laws of fluid mechanics and the Bernoulli's principle for practical applications
C303.5	Compute the discharge through pipes and over notches and weirs

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ACADEMIC YEAR 2019-20

COURSE OUTCOMES (ODD)

3rd Semester

COURSE NAME: BUILDING MATERIALS AND CONSTRUCTION

COURSE CODE: 18CV34 (C304)

COs	STATEMENTS
C304.1	Select suitable materials for buildings and adopt suitable construction techniques.
C304.2	Decide suitable type of foundation based on soil parameters
C304.3	Supervise the construction of different building elements based on suitability
C304.4	Exhibit the knowledge of building finishes and form work requirements

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ACADEMIC YEAR 2019-20

COURSE OUTCOMES (ODD)

3rd Semester

COURSE NAME: BASIC SURVEYING

COURSE CODE: 18CV35 (C305)

COs	STATEMENTS
C305.1	Possess a sound knowledge of fundamental principles Geodetics
C305.2	Measurement of vertical and horizontal plane, linear and angular dimensions to arrive at solutions to basic surveying problems.
C305.3	Capture geodetic data to process and perform analysis for survey problems]
C305.4	Analyse the obtained spatial data and compute areas and volumes. Represent 3D data on plane figures as contours

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ACADEMIC YEAR 2019-20

COURSE OUTCOMES (ODD)

3rd Semester

COURSE NAME: ENGINEERING GEOLOGY

COURSE CODE: 18CV36 (C306)

COs	STATEMENTS
C306.1	Apply geological knowledge in different civil engineering practice.
C306.2	Students will acquire knowledge on durability and competence of foundation rocks, and confidence enough to use the best building materials.
C306.3	Civil Engineers are competent enough for the safety, stability, economy and life of the structures that they construct.
C306.4	Able to solve various issues related to ground water exploration, build up dams, bridges, tunnels which are often confronted with ground water problems.
C306.5	Intelligent enough to apply GIS, GPS and remote sensing as a latest tool in different civil engineering construction.

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ACADEMIC YEAR 2019-20

COURSE OUTCOMES (ODD)

3rd Semester

COURSE NAME: COMPUTER AIDED BUILDING PLANNING AND DRAWING

COURSE CODE: 18CVL37 (C307)

COs	STATEMENTS
C307.1	Prepare, read and interpret the drawings in a professional set up.
C307.2	Know the procedures of submission of drawings and Develop working and submission drawings for building.
C307.3	Plan and design a residential or public building as per the given requirements.

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DEPARTMENT OF CIVIL ENGINEERING

ACADEMIC YEAR 2019-20

COURSE OUTCOMES (ODD)

3rd Semester

COURSE NAME: BUILDING MATERIALS TESTING LABORATORY

COURSE CODE: 18CVL38 (C308)

COs	STATEMENTS
C308.1	Reproduce the basic knowledge of mathematics and engineering in finding the strength in tension, compression, shear and torsion.
C308.2	Identify, formulate and solve engineering problems of structural elements subjected to flexure.
C308.3	Evaluate the impact of engineering solutions on the society and also will be aware of contemporary issues regarding failure of structures due to unsuitable materials.

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ACADEMIC YEAR 2019-20

COURSE OUTCOMES (ODD)

3rd Semester

COURSE NAME: CONSTITUTION OF INDIA, PROFESSIONAL ETHICS ANDCYBERLAW(CPC)

COURSE CODE: 18CVC39 (C309)

COs	STATEMENTS
C309.1	Have constitutional knowledge and legal literacy.
C309.2	Understand Engineering and Professional ethics and responsibilities of Engineers.
C309.3	Understand the the cybercrimes and cyber laws for cyber safety measures.

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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 2019-2020

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(17CS51)
10		Computer Networks and Security(17CS52)
11		Database Management Systems(17CS53)
12		Automata theory and Computability(17CS54)
13		Advanced JAVA and J2EE (17CS553)
14		Energy and Environment (17ME562)
15		Computer Networks Laboratory (17CSL57)
16		DBMS Laboratory with Mini Project(17CSL58)
17	7	Web Technology and its applications (15CS71)
18		Advanced Computer Architectures (15CS72)
19		Machine Learning (15CS73)
20		Information and Network Security (15CS743)
21		Storage Area Networks (15CS754)
22		Machine Learning Lab (15CSL76)

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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: 2019-20

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: 2019-20

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: 2019-20

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: 2019-20

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 COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR: 2019-20

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: 2019-20

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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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR: 2019-20

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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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: 2019-20

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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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: 2019-20

ODD SEMESTER-V

Course Name: Management, Entrepreneurship for IT industry **Course Code: 17CS51/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: 2019-20

ODD SEMESTER-V

Course Name: Computer Networks and Security **Course Code: 17CS52/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: 2019-20

ODD SEMESTER-V

Course Name: DATABASE MANAGEMENT SYSTEMS **Course Code: 17CS53/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: 2019-20

ODD SEMESTER-V

Course Name: Automata theory and Computability **Course Code: 17CS54/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: 2019-20

ODD SEMESTER-V

Course Name: Advanced JAVA and J2EE **Course Code: 17CS553/C505**

Cos	Statements
C5O5.1	Interpret the need for advanced Java concepts like enumerations and collections in developing modular and efficient programs
C5O5.2	Build client-server applications and TCP/IP socket programs
C5O5.3	Illustrate database access and details for managing information using the JDBC API
C5O5.4	Describe how servlets fit into Java-based web application architecture
C5O5.5	Develop reusable software components using Java Beans

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: 2019-20

ODD SEMESTER-V

Course Name: Energy and Environment **Course Code: 17ME562/C506**

Cos	Statements
C5O6.1	Summarize the basic concepts of energy, its distribution and general Scenario
C5O6.2	Explain different energy storage systems, energy management, audit and economic analysis.
C5O6.3	Summarize the environment eco system and its need for awareness.
C5O6.4	Identify the various types of environment pollution and their effects.
C5O6.5	Discuss the social issues of the environment with associated 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: 2019-20

ODD SEMESTER-V

Course Name: COMPUTER NETWORKS LABORATORY **Course Code:17CSL57/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: 2019-20

ODD SEMESTER-V

Course Name: DBMS LABORATORY WITH MINI PROJECT **Course Code:17CSL58/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: 2019-20

ODD SEMESTER-VII

Course Name: Web Technology and Its Applications **Course Code: 15CS71/C701**

Cos	Statements
C7O1.1	Adapt HTML and CSS syntax and semantics to build web pages.
C7O1.2	Construct and visually format tables and forms using HTML and CSS.
C7O1.3	Develop Client-Side Scripts using JavaScript and Server-Side Scripts using PHP to generate and display the contents dynamically.
C7O1.4	Appraise the principles of object oriented development using PHP.
C7O1.5	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

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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: 2019-20

ODD SEMESTER-VII

Course Name: ADVANCED COMPUTER ARCHITECTURES **Course Code: 15CS72/C702**

Cos	Statements
C7O2.1	Explain the concepts of parallel computing and hardware technologies
C7O2.2	Measure the performance of architectures in terms of right parameters.
C7O2.3	Explain parallel architecture and the software used for them.
C7O2.4	Compare and contrast the parallel architectures.
C7O2.5	Illustrate parallel programming concepts.

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

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR: 2019-20

ODD SEMESTER-VII

Course Name: MACHINE LEARNING **Course Code: 15CS73/C703**

Cos	Statements
C7O3.1	Identify the problems for machine learning. And select the either supervised, unsupersvised or reinforcement learning.
C7O3.2	Differentiate supervised, unsupervised and reinforcement learning
C7O3.3	Apply neural networks, Bayes classifier and k nearest neighbor, for problems appear in
C7O3.4	Explain theory of probability and statistics related to machine learning.
C7O3.5	Investigate concept learning, ANN, Bayes classifier, k nearest neighbor, Q.

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: 2019-20

ODD SEMESTER-VII

Course Name: Information and Network Security **Course Code: 17CS743/C704**

Cos	Statements
C7O4.1	Analyze the Digitals security lapses.
C7O4.2	Apply network management standards to manage practical networks
C7O4.3	Formulate possible approaches for managing OSI network model.
C7O4.4	Illustrate the need of key management.
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	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: 2019-20

ODD SEMESTER-VII

Course Name: STORAGE AREA NETWORKS **Course Code: 15CS754 /C705**

Cos	Statements
C7O5.1	Identify key challenges in managing information and analyze different storage
C7O5.2	Explain networking technologies and virtualization
C7O5.3	Explain components and the implementation of NAS
C7O5.4	Describe CAS architecture and types of archives and forms of v
C7O5.5	Ilustrate the storage infrastructure and management activities

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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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC YEAR: 2019-20

ODD SEMESTER-VII

Course Name: Machine Learning Lab **Course Code: 15CSL76/C706**

Cos	Statements
C7O6.1	Implement and demonstrate ML algorithms.
C7O6.2	Design 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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Department of Electronics and Communication Engineering

Academic Year: 2019-20

III - Semester

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
C303.1	Use Laplace transform and inverse Laplace transform in solving differential/ integral equation arising in network analysis, control systems and other fields of engineering
C303.2	Demonstrate Fourier series to study the behaviour of periodic functions and their applications in system communications, digital signal processing and field theory.
C303.3	Make use of Fourier transform and Z-transform to illustrate discrete/ continuous function arising in wave and heat propagation, signals and systems.
C303.4	Solve first and second order ordinary differential equations arising in engineering problems using single step and multistep numerical methods.
C303.5	Determine the extremals 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
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

Academic Year: 2019-20

III - Semester

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

Course Name : Network Theory
Course Code : 18EC32

Cos	Statements
C303.1	Determine currents and voltages using source transformation/ source shifting/ mesh/ nodal analysis and reduce given network using star- delta transformation/source transformation/ source shifting.
C303.2	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.
C303.3	Calculate current and voltages for the given circuit under transient conditions and Apply Laplace transform to solve the given network.
C303.4	Solve the given network using specified two port network parameters- Z, Y, T & h
C303.5	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	
CO5	1	1	1										1	
AVERAGE	1	0.8	1	0.8		1							1	

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Department of Electronics and Communication Engineering

Academic Year: 2019-20

III - Semester

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
C303.1	Understand the principles of semiconductor Physics
C303.2	Understand the principles and characteristics of different types of semiconductor devices
C303.3	Understand the fabrication process of semiconductor devices
C303.4	Utilize the mathematical models of semiconductor junctions for circuits and systems
C303.5	Identity the mathematical models of MOS transistors 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
C05	1	1		1										
AVERAGE	1	1		1		1								1

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Department of Electronics and Communication Engineering

Academic Year: 2019-20

III - Semester

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
C303.1	Explain the concept of combinational and sequential logic circuits.
C303.2	Analyze and design the combinational logic circuits
C303.3	Describe and characterize flip-flops and its applications.
C303.4	Design the sequential circuits using SR, JK, D, T flip-flops and Mealy & Moore machines
C303.5	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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III - Semester

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 / 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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III - Semester

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
C303.1	Build and test circuits using power electronic devices.
C303.2	Analyse and design-controlled rectifier, DC to DC converters, DC Toa inverters and SMPS.
C303.3	Analyze instrument characteristics and errors.
C303.4	Describe the principle of operation and develop circuits for multirange Ammeters, Voltmeters and Bridges to measure passive component values and frequency
C303.5	Explain the principle, design and analyze the transducers for measuring physical parameters

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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III - Semester

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
C307.1	Understand the circuit schematic and its working.
C307.2	Study the characteristics of different electronic devices
C307.3	Design and test simple electronic circuits as per the specifications using discrete electronic components
C307.4	Familiarize with EDA software which can be used for electronic circuit simulation

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

Department of Electronics and Communication Engineering

Academic Year: 2019-20

III - Semester

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
C308.1	.Design, realize and verity De Morgan's Theorem, SOP, POS forms
C308.2	Demonstrate the truth table of various expressions and combinational circuits using logic gates
C308.3	Design various combinational circuits such as adders, subtractors, comparators, multiplexers and demultiplexers
C308.4	Construct flips-flops, counters and shift registers
C308.5	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													
AVERAGE	1			2		2								

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Department of Electronics and Communication Engineering

Academic Year: 2019-20

V - Semester

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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Academic Year: 2019-20

V - Semester

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

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

Cos	Statements
C505.1	Understand the fundamental concepts of Management and Entrepreneurship and opportunities in order to setup a business
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		1		
CO4				1										
CO5				1					1	1	1	1		
AVERAGE				0.6		1	0.8	1	1	0.8	0.4	0.8		0.4

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Academic Year: 2019-20

V - Semester

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 : 17EC52

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	1												2	
CO2	1					1							1	
CO3	1												1	
CO4	1						1							
CO5	1													
AVERAGE	1					1	1						0.8	

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Department of Electronics and Communication Engineering

Academic Year: 2019-20

V - Semester

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

Course Name : Principals of Communication Theory
Course Code : 17EC53

Cos	Statements
C505.1	Analyze and compute performance of AM and FM modulation in the presence of noise at the receiver.
C505.2	Analyze and compute performance of digital formatting processes with quantization noise
C505.3	Multiplex digitally formatted signals at Transmitter
C505.4	Demultiplex the signals and reconstruct digitally formatted signals at the receiver
C505.5	Design /Demonstrate the use of digital formatting in Multiplexers, Vocoders and Video transmission

Co-Po Mapping

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

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Department of Electronics and Communication Engineering

Academic Year: 2019-20

V - Semester

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 : 17EC54

Cos	Statements
C505.1	Explain concept of Dependent & Independent Source, measure of information, Entropy, Rate of information 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 codeword 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	1	1		1	1	1							1	
CO2	1												1	
CO3	1													
CO4	1			1	1									
CO5	2												1	
AVERAGE	1.2	1		0.4		1							0.6	

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Academic Year: 2019-20

V - Semester

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

Course Name : Electromagnetic wave
Course Code : 17EC55

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 respect to magnetic materials and voltage induced in electric circuits
C505.5	Apply Maxwell's equations for time varying fields, EM waves in free space and conductors and Evaluate power associated with EM waves using Poynting theorem

Co-Po Mapping

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	1		1			1						1	
CO2														
CO3	1													
CO4		1		1									1	
CO4							1							
CO5	1												1	
AVERAGE	0.8	0.4		0.4			0.4						0.6	

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Department of Electronics and Communication Engineering

Academic Year: 2019-20

V - Semester

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

Course Name : Verilog HDL
Course Code : 17EC56

Cos	Statements
C505.1	Write Verilog programs in gate, dataflow (RTL), behavioral and switch modeling levels of Abstraction.
C505.2	Design and verify the functionality of digital circuit/system using testbenches
C505.3	Identify the suitable Abstraction level for a particular digital design
C505.4	Write the programs more effectively using Verilog tasks, functions and directives
C505.5	Perform timing and delaySimulation and Interpret the various constructs in logic synthesis

Co-Po Mapping

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

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Academic Year: 2019-20

V - Semester

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

Course Name : Digital Signal Processing Laboratory
Course Code : 17ECL57

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 the results
C505.4	Realize the digital filters using a simulation tool and analyze the response of the filter for an audio signal
C505.5	Write programs using MATLAB / Scilab/Octave to illustrate DSP concepts

Co-Po Mapping

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

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Department of Electronics and Communication Engineering

Academic Year: 2019-20

V - Semester

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

Course Name : HDL Laboratory
Course Code : 17ECL58

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 de-scription 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

Co-Po Mapping

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

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Department of Electronics and Communication Engineering

Academic Year: 2019-20

VII – Semester

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

Course Name : Computer Networks
Course Code : 15EC71

Cos	Statements
C701.1	Understand the concepts of networking
C701.2	Describe the various networking architectures
C701.3	Identify the protocols and services of different layers.
C701.4	Distinguish the basic network configurations and standards associated with each network
C701.5	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	
CO2	2			2			1						1	
CO3	1			1		1							1	
CO4	1		1										1	
CO5	1	1				1							1	
AVERAGE	1.4	1	1	0.8		0.6	1						1	

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Department of Electronics and Communication Engineering

Academic Year: 2019-20

VII – Semester

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

Course Name : VLSI Design
Course Code :15EC72

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 the 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											2	
CO2	2	1											2	
CO3	1												1	
CO4	1													
CO4	1			1		1							1	
CO5	1			1		1							1	
AVERAGE	1.6	0.4		0.4		0.4							1.4	

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Department of Electronics and Communication Engineering

Academic Year: 2019-20

VII – Semester

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 : 15EC731

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 time applications
C705.5	Apply suitable methodologies to design and develop Real-Time Systems

Co-Po Mapping

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

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Department of Electronics and Communication Engineering

Academic Year: 2019-20

VII – Semester

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 : 15ECL76

Cos	Statements
C705.1	Choose suitable tools to model a network
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	1												1	
CO2	1	1	1											
CO3	1												1	
CO4	1					1								
CO5	1					1							1	
AVERAGE	1	1	1			0.4							0.6	

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Department of Electronics and Communication Engineering

Academic Year: 2019-20

VII – Semester

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

Course Name : VLSI laboratory
Course Code : 15ECL77

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							1	
CO2	1	1		1			1						1	
CO3	1												1	
CO4													1	
CO5	2		1	1									1	
AVERAGE	1.2	0.4	0.4	0.4		1	1						1	

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Department of Mechanical Engineering
ACADEMIC YEAR 2019-20
Course Outcomes and CO-PO-PSO Articulation Matrix

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 extremals 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 behavior 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	**Analyze** 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	

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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.	

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).	

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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.	

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: ENERGY ENGINEERING		**Subject Code:**17ME71
Course Outcomes		
CO1	Summarize the basic concepts of thermal energy systems	
CO2	Identify renewable energy sources and their utilization	
CO3	Understand the basic concepts of solar radiation and analyze the working of solar PV and thermal systems.	
CO4	Understand principles of energy conversion from alternate sources including wind, geothermal, ocean, biomass, and biogas.	
CO5	Understand the concepts and applications of fuel cells, thermoelectric convertor and MHD generator. Identify methods of energy storage for specific applications.	

Subject: FLUID POWER SYSTEMS		**Subject Code:**17ME72
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: CONTROL ENGINEERING		**Subject Code:**17ME73
Course Outcomes		
CO1	Identify control system & its types, control actions	
CO2	Determine the system governing equations for physical modes	
CO3	Analyze the gain of the systems using block diagrams & SFG	
CO4	Evaluate the stability of transfer functions in complex domain &frequency domain	
CO5	Employ state equations to study the controllability & observability	

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Subject: MECHATRONICS		**Subject Code:**17ME754
Course Outcomes		
CO1	Illustrate various components of mechatronics system	
CO2	Develop electronic, , hydraulic, pneumatic an electrical actuation circuits using , sensors, transducers, Microprocessors and PLC programming	
CO3	Construct hydraulic and pneumatic circuits using Automation studio software	
CO4	Propose a solution for the situation related to automation system	

Subject: DESIGN LAB		**Subject Code:**17MEL76
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: CIM LAB		**Subject Code:**17MEL77
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 Toolpath for different machining operations using CNC TRAIN software.	

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CITY ENGINEERING COLLEGE

Department of Basic Science

2.6.1 QlM Programme Outcomes (POs) and Course Outcomes (COs) offered by the department (EVEN and ODD) ACY 2019-2020

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

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CITY ENGINEERING COLLEGE

DEPARTMENT OF BASIC SCIENCE

ACADEMIC YEAR 2019-20

COURSE OUTCOMES OF I YEAR

COURSE NAME: CALCULUS AND LINEAR ALGEBRA
COURSE CODE: 18MAT11 [C101]

COs	STATEMENTS
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	

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COURSE NAME: Engineering Physics

COURSE CODE: 18PHY12/22 [C102]

COs	STATEMENTS
C102.1	Understand various types of oscillations and the implications, the role of Shock waves in various fields and Recognize the elastic properties of materials for engineering applications.
C102.2	Realize the inter relation between time varying electric field and magnetic field, the transverse nature of the EM waves and their role in optical fiber communication
C102.3	Compute Eigen values, Eigen functions, momentum of Atomic and subatomic particles using Time independent 1-D Schrodinger's wave equation.
C102.4	Apprehend theoretical background of laser, construction and working of different types of laser and its applications indifferent fields
C102.5	Understand various electrical and thermal properties of materials like conductors, semiconductors and dielectrics using different theoretical models.

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													
C102.3	2	1													
C102.4	2	2											2		
C102.5	2	2													

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COURSE NAME: Basic Electrical Engineering
COURSE CODE: 18ELE13/23 [C103]

COs	STATEMENTS
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]

COs	STATEMENTS
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	

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COURSE NAME: Engineering Physics laboratory

COURSE CODE: 18PHYL16/26 [C106]

COs	STATEMENTS
C106.1	Apprehend the concepts of interference of light, diffraction of light, Fermi energy and magnetic effect of current
C106.2	Understand the principles of operations of optical fibers and semiconductor devices such as Photodiode, and NPN transistor using simple circuits
C106.3	Determine elastic moduli and moment of inertia of given materials with the help of suggested procedures
C106.4	Recognize the resonance concept and its practical applications
C106.5	Understand the importance of measurement procedure, honest recording and representing the data, reproduction of final results

CO-PO-PSO Mapping:

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

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COURSE NAME: Basic Electrical and Engineering laboratory
COURSE CODE: 18ELEL17/27 [C107]

COs	STATEMENTS
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					

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COURSE NAME: Technical English-I
COURSE CODE: 18EGH18 [C108]

COs	STATEMENTS
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

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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, modem 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	

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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		

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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]

COs	STATEMENTS
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		

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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]

COs	STATEMENTS
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

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