



2.6.1 Programme and course outcomes for all Programmes offered by the institution are stated and displayed on website and communicated to teachers and students

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MANGALORE INSTITUTE OF TECHNOLOGY & ENGINEERING

Accredited by NAAC with A+ Grade, An ISO 9001: 2015 Certified Institution

(A Unit of Rajalaxmi Education Trust®, Mangalore - 575001)

Affiliated to V.T.U., Belagavi, Approved by AICTE, New Delhi.

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Preamble

Course Outcomes (COs) for all Programmes

As per the affiliating university syllabus there are four schemes, during the academic year 2022-23 (2018, 2021 & 2022 Scheme for UG programmes, 2020 & 2022 Scheme for Master of Business Administration and 2022 Scheme for Master of Computer Application). In the assessment period 3rd & 4th year students of UG were studied 2018 Scheme, 2nd year students were studied 2021 scheme and 1st year students of UG were studied 2022 Scheme. In case of Master of Business Administration (MBA); during the assessment period 2nd year students were studied 2020 Scheme, whereas 1st year students of both Master of Business Administration (MBA) and Master of Computer Application (MCA) students were studied 2022 Scheme.

We have enclosed the Course Outcomes of 2018, 2021, 2022 Scheme of UG, 2020, 2022 Scheme of MBA and 2022 Scheme of MCA.

Course Outcomes (COs)

2022 Scheme

First Year UG Engineering Courses

Course Outcomes (COs) of First Year Courses (Common to all UG Engineering Programmes)

Course Title	Introduction to Web Programming
Course Code	BPLCK105A/BPLCK205A
Course outcomes (COs): At the end of the course the student will be able to:	
C105.1	To use the syntax and semantics of HTML and XHTML.
C105.2	To develop different parts of a web page.
C105.3	To understand how CSS can enhance the design of a webpage.
C105.4	To create and apply CSS styling to a webpage.
C105.5	Implement core constructs and event handling mechanisms of JavaScript.

Course Title	Professional Writing Skills in English
Course Code	BPWSK106/206
Course outcomes (COs) : At the end of the course the student will be able to:	
C106.1	To Identify the Common Errors in Writing and Speaking of English
C106.2	To Achieve better Technical writing and Presentation skills for employment.
C106.3	To read Technical proposals properly and make them to write good technical reports.
C106.4	To Acquire Employment and Workplace communication skills.
C106.5	To learn about Techniques of Information Transfer through presentation in different level.

Course Title	Sanskritika Kannada
Course Code	BKSKK107/207
Course outcomes (COs) : At the end of the course the student will be able to:	
C107A.1	ಕನ್ನಡ ಭಾಷೆ, ಸಾಹಿತ್ಯ ಮತ್ತು ಕನ್ನಡದ ಸಂಸ್ಕೃತಿಯ ಪರಿಚಯವಾಗುತ್ತದೆ.
C107A.2	ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಆಧುನಿಕ ಪೂರ್ವ ಮತ್ತು ಆಧುನಿಕ ಕಾವ್ಯಗಳು ಹಾಗೂ ಸಂಸ್ಕೃತಿಯ ಬಗ್ಗೆ ಆಸಕ್ತಿ ಮೂಡಿಸುತ್ತದೆ.
C107A.3	ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯವಾಗುತ್ತದೆ ಹಾಗೂ ಕಥೆ ಮತ್ತು ಪ್ರವಾಸ ಕಥನಗಳ ಬಗ್ಗೆ ಅರಿವು ಮೂಡುತ್ತದೆ.

Course Title	Balake Kannada
Course Code	BKBKK107
Course outcomes (COs) : At the end of the course the student will be able to:	
C107B.1	Understand the necessity of learning of local language for comfortable life.
C107B.2	Listen, understand and speak politely in Kannada language as per requirement.
C107B.3	To communicate in Kannada language in their daily life with Kannada speakers

Course Title	Scientific Foundations for Health
Course Code	BSFHK158/258

Course outcomes (COs) : At the end of the course the student will be able to:	
C108.1	To understand and analyse about Health and wellness (and its Beliefs) & It's balance for positive mindset.
C108.2	Develop the healthy lifestyles for good health for their better future.
C108.3	Build a Healthy and caring relationships to meet the requirements of good/social/positive life
C108.4	To learn about Avoiding risks and harmful habits in their campus and outside the campus for their bright future.
C108.5	Prevent and fight against harmful diseases for good health through positive mindset

Course Title	Indian Constitution
Course Code	BICOK107/207
Course outcomes (COs) : At the end of the course the student will be able to:	
C115.1	Analyse the basic structure of the Indian Constitution.
C115.2	Remember their Fundamental Rights, DPSP and Fundamental Duties (FD's) of our constitution.
C115.3	Know about our Union Government, political structure & codes, procedures.
C115.4	Understand our State Executive & Elections system of India.
C115.5	Remember the Amendments and Emergency Provisions, other important provisions given by the constitution

Course Title	Innovation and Design Thinking
Course Code	BIDTK158/258
Course outcomes (COs) : At the end of the course the student will be able to:	
C116.1	Understand the Process of Design Thinking
C116.2	Analyse the design thinking for real-time interaction
C116.3	Practice the methods, processes, and tools of Design Thinking in IT
C116.4	Understand design thinking For strategic innovations
C116.5	Apply the Design Thinking approach and model to real world situations

Course Title	Introduction to Internet of Things (IoT)
Course Code	BETCK105H
Course outcomes (COs) : At the end of the course the student will be able to:	
C213.1	Describe the evolution of IoT, IoT networking components, and addressing strategies in IoT.
C213.2	Classify the various sensing devices and types of actuators.
C213.3	Demonstrate the processing in IoT topologies, design, and selection consideration of IOT devices.
C213.4	Explain the associated IOT technologies and case study.
C213.5	Illustrate the architecture of IOT Applications.

Course Title	Computer-Aided Engineering Drawing
Course Code	BCEDK103/203

Course outcomes (COs) : At the end of the course the student will be able to:	
C112.1	Visualize and draw orthographic projections of points, lines, planes with definite dimensions, and learn the use of Solid Edge software tools to produce the engineering drawing.
C112.2	Visualize and draw projection of solids
C112.3	Visualize and draw isometric views of solids and combination of solids
C112.4	Visualize and develop lateral surfaces of solids
C112.5	Identification of interdisciplinary engineering components and systems through its graphical representation

Course Title	Introduction to Mechanical Engineering
Course Code	BESCK104/204D
Course outcomes (COs) : At the end of the course the student will be able to:	
C213.1	Explain the concepts of role of mechanical engineering in industries, society & energy sectors.
C213.2	Describe the machine tool operations and advanced manufacturing processes.
C213.3	Explain the working principle of IC Engines and electrical hybrid vehicles
C213.4	Discuss the properties of common engineering materials & metal joining processes.
C213.5	Explain the concepts of Mechatronics, Robotics and Automation in IoT

Course Outcomes (COs) of First Year Courses (Scheme for Civil Engineering Programme)

Course Title	Mathematics-I for Civil Engineering stream
Course Code	BMATC101
Course outcomes (COs) : At the end of the course the student will be able to:	
C101.1	Apply the knowledge of calculus to solve problems related to polar curves.
C101.2	Learn the notion of partial differentiation to compute rate of change of multivariate functions.
C101.3	Analyze the solution of linear and nonlinear ordinary differential equations.
C101.4	Make use of matrix theory for solving the system of linear equations and compute
C101.5	Familiarize with modern mathematical tools namely MATHEMATICA/ MATLAB/ PYTHON/SCILAB

Course Title	Applied Physics for CV Stream
Course Code	BPHYC102/202
Course outcomes (COs) : At the end of the course the student will be able to:	
C102.1	Elucidate the concepts in oscillations, waves, elasticity and material failures
C102.2	Summarize concepts of acoustics in buildings and explain the concepts in radiation and photometry
C102.3	Discuss the principles photonic devices and their application relevant to civil engineering.
C102.4	Describe the various natural hazards and safety precautions.
C102.5	Practice working in groups to conduct experiments in physics and perform precise and honest measurements.

Course Title	Engineering Mechanics
Course Code	BCIVC103/203
Course outcomes (COs) : At the end of the course the student will be able to:	
C103.1	Compute the resultant of a force system and resolution of a force.
C103.2	Comprehend the action for forces, moments, and other types of loads on rigid bodies and compute the reactive forces
C103.3	Analyze the frictional resistance offered by different planes
C103.4	Locate the centroid and compute the moment of inertia of sections
C103.5	Analyze the bodies in motion

Course Title	Mathematics II for Civil Stream
Course Code	BMATC201
Course outcomes (COs) : At the end of the course the student will be able to:	
C209.1	Apply the Knowledge of multiple integrals to compute Area and Volume.
C209.2	Understand the applications of Vector Calculus refer to Solenoidal irrotational vectors, Line integral& Surface integral.
C209.3	Demonstrate partial differential equations & their solutions for physical

	interpretation.
C209.4	Apply the Knowledge of numerical methods in solving physical and engineering phenomena.
C209.5	Get familiarize with modern mathematical tools namely MATLAB/Python/Scilab.

Course Title	Chemistry for Civil Engineering stream
Course Code	BCHEC102/202
Course outcomes (COs) : At the end of the course the student will be able to:	
C210.1	Discuss the principle, construction and working of energy storage and conversion devices.
C210.2	Explain fundamental concepts of corrosion, its control and surface modification techniques namely electroplating and electrolysis plating.
C210.3	Enumerate the importance, synthesis and applications of macromolecules and composite materials.
C210.4	Understand the phase rule, phase diagram and the applications of various analytical techniques.
C210.5	Describe the engineering applications of alloys, ceramics and nano materials.

Course Outcomes (COs) of First Year Courses (Scheme for Computer Science Engineering and allied Programmes)

Course Title	Mathematics for Computer Science and Engineering Stream-I
Course Code	BMATS101
Course outcomes (COs) : At the end of the course the student will be able to:	
C101.1	Apply knowledge of calculus to solve problems related to polar curves. Implement the same using MATLAB.
C101.2	Demonstrate the understanding of basics of partial differentiation and optimization of multivariate functions. Implement the same using MATLAB.
C101.3	Solve first order linear and nonlinear ordinary differential equations that arise in engineering problems analytically. Compute the same using MATLAB.
C101.4	Apply the concept of congruences to evaluate Diophantine equations, GCD and understand prime numbers. Compute the same using MATLAB.
C101.5	Solve the system of linear equations using matrix theory, compute eigenvalues & eigenvectors. Demonstrate the same using MATLAB.

Course Title	Applied Physics for CSE Stream
Course Code	BPHYS102/202
Course outcomes (COs) : At the end of the course the student will be able to:	
C102.1	Describe the principles of LASERS and Optical fibers and their relevant applications.
C102.2	Discuss the basic principles of the Quantum Mechanics and its application in Quantum Computing.
C102.3	Summarize the essential properties of superconductors and its applications in qubits.
C102.4	Illustrate the application of physics in design and data analysis.
C102.5	Practice working in groups to conduct experiments in physics and perform precise and honest measurements.

Course Title	Principles of Programming using C
Course Code	BPOPS103/ BPOPS203
Course outcomes (COs) : At the end of the course the student will be able to:	
C103.1	Elucidate the basic architecture and functionalities of a computer and also recognize the hardware parts.
C103.2	Apply programming constructs of C language to solve the real world problem.
C103.3	Explore user-defined data structures like arrays in implementing solutions to problems like searching and sorting.
C103.4	Explore user-defined data structures like structures, unions and pointers in implementing solutions.
C103.5	Design and Develop Solutions to problems using modular programming constructs using functions.

Course Title	Mathematics-II for CSE Stream
Course Code	BMATS201
Course outcomes (COs) : At the end of the course the student will be able to:	
C209.1	Compute Area and volume using multiple integrals. Implement the same using MATLAB.
C209.2	Demonstrate solenoidal and irrotational vectors. Solve problems involving orthogonality and coordinate transformation. Compute the same using MATLAB.
C209.3	Apply the concept of matrix of linear transformation to find rank and nullity. Evaluate the same using MATLAB.
C209.4	Solve algebraic and transcendental equations. Interpolate and integrate using numerical methods also compute the same using MATLAB.
C209.5	Apply numerical methods to solve initial value problems. Compute the same using MATLAB.

Course Title	Applied Chemistry for CSE stream
Course Code	BCHES102/202
Course outcomes (COs) : At the end of the course the student will be able to:	
C210.1	Identify the terms and applications processes involved in scientific and engineering
C210.2	Explain the phenomena of chemistry to describe the methods of engineering processes
C210.3	Solve the problems in chemistry that are pertinent in engineering applications
C210.4	Apply the basic concepts of chemistry to explain the chemical properties and processes
C210.5	Analyze properties and processes associated with chemical substances in multidisciplinary situations

Course Outcomes (COs) of First Year Courses (Scheme for Electronics & Communication Engineering Programme)

Course Title	Mathematics-I for EEE Streams
Course Code	BMATE101
Course outcomes (COs) : At the end of the course the student will be able to:	
C101.1	Apply knowledge of calculus to solve problems related to polar curves. Implement the same using MATLAB.
C101.2	Demonstrate the understanding of basics of partial differentiation and optimization of multivariate functions. Implement the same using MATLAB.
C101.3	Solve first order linear and nonlinear ordinary differential equations that arise in engineering problems analytically. Compute the same using MATLAB.
C101.4	Apply the concept of change of order of integration and variables to evaluate multiple integrals and their usage in computing area and volume. Compute the same using MATLAB.
C101.5	Solve the system of linear equations using matrix theory, compute eigenvalues & eigenvectors. Demonstrate the same using MATLAB.

Course Title	Applied Physics for ECE Stream
Course Code	BPHYE102/202
Course outcomes (COs) : At the end of the course the student will be able to:	
C102.1	Describe the fundamental principles of the Quantum Mechanics and the essentials of Photonics.
C102.2	Elucidate the concepts of conductors, dielectrics and superconductivity
C102.3	Discuss the fundamentals of vector calculus and their applications in Maxwell's Equations and EM Waves
C102.4	Summarize the properties of semiconductors and the working principles of semiconductor devices.
C102.5	Practice working in groups to conduct experiments in physics and Perform precise and honest measurements

Course Title	Basic Electronics Course for EEE Stream
Course Code	BBEE103
Course outcomes (COs) : At the end of the course the student will be able to:	
C103.1	Develop basic knowledge on construction, operation, and characteristics of semiconductor devices.
C103.2	Apply the acquired knowledge to construct small scale circuits consisting of semiconductor devices.
C103.3	Develop competent knowledge to study linear op amps and its applications.
C103.4	Develop competent knowledge to construct basic digital circuits by make use of basic gates and its function.
C103.5	Apply the knowledge of various transducer principles in sensor system. Construct the conceptual blocks for basic communication system

Course Title	Introduction to Electrical Engineering
Course Code	BESCK104B
Course outcomes (COs) : At the end of the course the student will be able to:	
C104.1	Discuss the power generation concepts and analyze the behaviour of DC circuits using Ohm's law and Kirchoff's Laws.
C104.2	Infer the phasor relationship between voltage and current in series and parallel combination of single-phase R-L-C circuit. Identify the relationship between line and phase quantities in a three-phase AC circuit.
C104.3	Outline the relation between terminal voltage, load voltage, flux linkage, torque, and speed in DC Motors and Generators.
C104.4	Illustrate the concept of transformers in transmission and distribution of electric power. Explain the construction and working principle of induction motor.
C104.5	Demonstrate the electric wiring, calculate electricity bill, and recognize the need for electrical safety measures.

Course Title	Mathematics for Electrical and Electronics Engineering Stream-II
Course Code	BMATE102
Course outcomes (COs) : At the end of the course the student will be able to:	
C209.1	Understand and apply the concepts of vector calculus including solenoidal, irrotational vectors, line integral and surface integral. Implement the same using MATLAB.
C209.2	Demonstrate the idea of Linear dependence and independence of sets in the vector space, and linear transformation. Implement the same using MATLAB.
C209.3	To understand the concept of Laplace transform. Compute the same using MATLAB.
C209.4	Apply the knowledge of numerical methods in various physical and engineering phenomena. Compute the same using MATLAB.
C209.5	Solve first order ordinary differential equations arising in engineering problems.. Compute the same using MATLAB.

Course Title	Chemistry for EEE stream
Course Code	BCHEE102/202
Course outcomes (COs) : At the end of the course the student will be able to:	
C210.1	Enumerate the importance, synthesis and applications of conducting materials.
C210.2	Discuss the principle, construction and working of energy storage and conversion devices.
C210.3	Explain fundamental concepts of corrosion and e waste management.
C210.4	Understand properties and applications of nanomaterials. Describe the chemistry involved in display systems
C210.5	Elucidate the working and applications involved in sensors and understand the applications of various analytical techniques.

Course Outcomes (COs) of First Year Courses (Scheme for Mechanical Engineering and allied Programmes)

Course Title	Mathematics-I for Mechanical Stream
Course Code	21MATM101
Course outcomes (COs) : At the end of the course the student will be able to:	
C101.1	Apply knowledge of calculus to solve problems related to polar curves. Implement the same using MATLAB.
C101.2	Demonstrate the understanding of basics of partial differentiation and optimization of multivariate functions. Implement the same using MATLAB.
C101.3	Solve first order linear and nonlinear ordinary differential equations that arise in engineering problems analytically. Compute the same using MATLAB.
C101.4	Demonstrate various models through higher order differential equations and solve such linear ordinary differential equations. Compute the same using MATLAB.
C101.5	Solve the system of linear equations using matrix theory, compute eigenvalues & eigenvectors. Demonstrate the same using MATLAB.

Course Title	Applied Physics for ME Stream
Course Code	BPHYM102/202
Course outcomes (COs) : At the end of the course the student will be able to:	
C102.1	Elucidate the concepts in oscillations, waves, elasticity and material failures
C102.2	Discuss the fundamentals of Thermoelectric materials and their application
C102.3	Summarize the low temperature phenomena and generation of low temperature
C102.4	Explain the various material characterization techniques
C102.5	Practice working in groups to conduct experiments in physics and perform precise and honest measurements.

Course Title	Elements of Mechanical Engineering
Course Code	BEMEM103
Course outcomes (COs) : At the end of the course the student will be able to:	
C103.1	Explain the role of mechanical engineers in industry and society, fundamentals of steam and non-conventional energy sources.
C103.2	Describe the working principle of Lathe, Milling, Drilling Machines, Computer Numerical Control (CNC) and 3D Printing.
C103.3	Discuss the construction and application of IC Engines, Refrigerators and Air-conditioner.
C103.4	Explain the principles of power transmission and metal joining processes.
C103.5	Discuss the construction and applications of future mobility technology; also describe the components and working of robotics and mechatronic systems.

Course Title	Mathematics-II for ME Streams
Course Code	BMATM201
Course outcomes (COs) : At the end of the course the student will be able to:	
C209.1	Apply the Knowledge of multiple integrals to compute Area and Volume.
C209.2	Understand the applications of Vector Calculus refer to Solenoidal irrotational vectors, Line integral& Surface integral.
C209.3	Demonstrate partial differential equations & their solutions for physical interpretation.
C209.4	Apply the Knowledge of numerical methods in solving physical and engineering phenomena.
C209.5	Get familiarize with modern mathematical tools namely Matlab/Python/SCILab.

Course Title	Chemistry for ME stream
Course Code	BCHEM102/202
Course outcomes (COs) : At the end of the course the student will be able to:	
C210.1	Discuss the principle, construction and working of energy storage and conversion devices.
C210.2	Explain fundamental concepts of corrosion, its control and surface modification techniques namely electroplating and electroless plating.
C210.3	Enumerate the importance, synthesis and applications of macromolecules and composite materials.
C210.4	Understand the phase rule, phase diagram and the applications of various analytical techniques.
C210.5	Describe the engineering applications of alloys, ceramics and nano materials.

Course Outcomes (COs)

2021 & 2018 Scheme

**Second, Third & Fourth Year UG
Engineering Courses**

Course Outcomes (COs) of Second Year Courses (Common to all UG Engineering Programmes)

Course Title	Transform Calculus, Fourier Series and Numerical Techniques
Course Code	21MAT31
Course outcomes (COs) : At the end of the course the student will be able to:	
C201.1	Solve ordinary differential equations using Laplace transform.
C201.2	Demonstrate the Fourier series to study the behaviour of periodic functions and their applications in system communications, digital signal processing and field theory.
C201.3	Make use of Fourier transforms to analyze problems involving continuous-time signals and to apply Z-Transform techniques to solve difference equations
C201.4	Solve mathematical models represented by initial or boundary value problems involving partial differential equations
C201.5	Determine the extremals of functionals using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis.

Course Title	Social Connect and Responsibility
Course Code	21SCR36
Course outcomes (COs) : At the end of the course the student will be able to:	
C206.1	Understand the need, and social responsibility in plantation, adoption of a tree.
C206.2	Develop connections with people around through their history and knowing the history, culture of the city.
C206.3	Practice sustainability and creativity by understanding the usefulness of organic farming and wet waste management.
C206.4	Apply sustainability by learning the methods of water conservation.
C206.5	Build planning and organizational skills by inculcating healthy food practices.

Course Title	Constitution of India and Professional Ethics
Course Code	21CIP37
Course outcomes (COs) : At the end of the course the student will be able to:	
C207.1	Having Constitutional knowledge and legal literacy.
C207.2	Understand Engineering and Professional Ethics and responsibilities of engineers.

Course Title	Biology for Engineers
Course Code	21BE45
Course outcomes (COs) : At the end of the course the student will be able to:	
C213.1	Elucidate the basic biological concepts via relevant industrial applications and case studies
C213.2	Evaluate the principles of design and development, for exploring novel bioengineering projects
C213.3	Corroborate the concepts of biomimetics for specific requirements
C213.4	Think critically towards exploring innovative biobased solutions for socially relevant problems

Course Title	Sanskrutika Kannada
Course Code	21KSK47

Course outcomes (COs) : At the end of the course the student will be able to:	
C215A.1	ಕನ್ನಡ ಭಾಷೆ, ಸಾಹಿತ್ಯ ಮತ್ತು ಕನ್ನಡದ ಸಂಸ್ಕೃತಿಯ ಪರಿಚಯವಾಗುತ್ತದೆ.
C215A.2	ಕನ್ನಡ ಸಾಹಿತ್ಯದ ಆಧುನಿಕ ಪೂರ್ವ ಮತ್ತು ಆಧುನಿಕ ಕಾವ್ಯಗಳು ಹಾಗೂ ಸಂಸ್ಕೃತಿಯ ಬಗ್ಗೆ ಆಸಕ್ತಿ ಮೂಡಿಸುತ್ತದೆ.
C215A.3	ತಾಂತ್ರಿಕ ವ್ಯಕ್ತಿಗಳ ಪರಿಚಯವಾಗುತ್ತದೆ ಹಾಗೂ ಕಥೆ ಮತ್ತು ಪ್ರವಾಸ ಕಥನಗಳ ಬಗ್ಗೆ ಅರಿವು ಮೂಡುತ್ತದೆ.

Course Title	Balake Kannada
Course Code	21KKBK47
Course outcomes (COs) : At the end of the course the student will be able to:	
C215B.1	To listen and understand the Kannada language properly.
C215B.2	To speak, read and converse in Kannada language.

Course Title	Universal Human Values
Course Code	21UH49
Course outcomes (COs) : At the end of the course the student will be able to:	
C217.1	Understand and analyze the essentials of human values and skills, self-exploration, happiness, and prosperity.
C217.2	Evaluate the coexistence of the Self with the body.
C217.3	Identify and evaluate the role of harmony in the family, society, and universal order.
C217.4	Understand and associate the holistic perception of harmony at all levels of existence.
C217.5	Develop appropriate technologies and management patterns to create harmony in professional and personal lives.

Course Title	Inter/Intra Institutional Internship
Course Code	21INT49
Course outcomes (COs) : At the end of the course the student will be able to:	
C218.1	Enhance the existing knowledge and gain practical experience.
C218.2	Present the Knowledge acquired through internship by means of Oral Presentation.
C218.3	Work in teams and document the results obtained.
C218.4	Write reports based on the theme of the internship in a professional and reflective manner.
C218.5	Answer the questions related to the theme of the internship in a clear and descriptive manner.

Course Outcomes (COs) of Third Year Course (Common to all UG Engineering Programmes)

Course Title	Environmental Studies
Course Code	18CIV59
Course outcomes (COs) : At the end of the course the student will be able to:	
C309.1	Understand the principles of ecology and environmental issues that apply to air, land, and water issues on a global scale.
C309.2	Apply their ecological knowledge to illustrate and graph a problem and describe the realities that managers face when dealing with complex issues.
C309.3	Develop critical thinking and observation skills, and apply them to the analysis of a problem or question related to the environment.
C309.4	Build the Global environmental concerns and the individual responsibility to protect environment with environmental protection laws and education.
C309.5	Analyze and evaluate strategies, technologies, and methods for sustainable management of environmental systems and for the remediation or restoration of degraded environments.

Course Outcomes (COs) of Department of Aeronautical Engineering

Course Title	Aircraft Materials and Processes(+ Manufacturing Process Lab)
Course Code	21AE32
Course outcomes (COs) : At the end of the course the student will be able to:	
C202.1	Apply the knowledge about the mechanical behaviour of different aircraft & aerospace materials.
C202.2	Explain the applications of Aluminium alloys, Magnesium Alloys , Titanium Alloys and Wood and Fabric
C202.3	Understand the properties of steels and super alloys for aircraft & aerospace applications
C202.4	Enumerate the properties and aerospace applications of Ceramics and Composites
C202.5	Understand the principles and applications of Non Destructive Tests

Course Title	Fluid Mechanics (+ Fluid Mechanics Lab)
Course Code	21AE33
Course outcomes (COs) : At the end of the course the student will be able to:	
C203.1	Understand the basic fluid flow properties and fluid statics
C203.2	Describe the governing equations and fundamentals of fluid motion.
C203.3	Apply the basics of dimensional analysis and the application of Bernoulli's principle in the flow measuring devices.
C203.4	Analyze flow past immersed bodies and sources of aerodynamic forces
C203.5	Analyze compressible fluid flow, propagation of pressure waves and stagnation properties.

Course Title	Elements of Aeronautics
Course Code	21AE34
Course outcomes (COs) : At the end of the course the student will be able to:	
C204.1	Understand the history of aviation and its evolution and apply the basic principle of aviation
C204.2	Apply the basic principles of flight
C204.3	Compare the propulsive devices and its techniques used in aircraft Industry
C204.4	Analyze the motions of an aircraft based on its stability conditions
C204.5	Understand the mechanical and electrical based systems used in aircraft and its working principles

Course Title	CAAD (Computer Aided Aircraft Drawing)
Course Code	21AEL35
Course outcomes (COs) : At the end of the course the student will be able to:	
C205.1	Understand general projection theory, with an emphasis on the use of orthographic projection.
C205.2	Imparting fundamental knowledge to draw and understand the applications of different , mechanical joints, riveted joints, coupling
C205.3	Improve their visualization skills and to design , assemble aircraft parts using part drawings.

Course Title	Complex Analysis, Probability and Linear Programming
Course Code	21MATME41
Course outcomes (COs) : At the end of the course the student will be able to:	
C.208.1	Use the concepts of analytic function and complex potentials to solve the problems arising in Fluid flow
C.208.2	a) Understand the concept of conformal transformation and solve the problems on bilinear transformation. b) Apply the concept of line integral to solve the problems on Cauchy theorem and Cauchy integrals.
C.208.3	Apply the discrete and continuous probability distributions to solve the probability models arising in the engineering field.
C.208.4	Formulate linear programming problems and solve them by the simplex method.
C.208.5	Solve transportation and assignment problems.

Course Title	Aerodynamics (+ Aerodynamics Lab)
Course Code	21AE42
Course outcomes (COs) : At the end of the course the student will be able to:	
C209.1	Understand the basics of fluid mechanics and generation of lift.
C209.2	Acquire knowledge on typical airfoil characteristics and two-dimensional flows.
C209.3	Understand the concept of compressible flow.
C209.4	Analyze the behaviour of nozzle under various mach number.
C209.5	Formulate the effect of shocks and wave formation.

Course Title	Aero Engineering Thermodynamics
Course Code	21AE43
Course outcomes (COs) : At the end of the course the student will be able to:	
C210.1	Summarize the thermodynamic systems and its properties, Interaction of work and heat.
C210.2	Outline internal energy and enthalpy using First law of thermodynamics.
C210.3	Demonstrate entropy and efficiency of Carnot cycle using Second law of thermodynamics.
C210.4	Analyze behavior of pure substances using thermodynamics relations for ideal gases.
C210.5	Formulate the performance of gas power cycles including propulsion systems and steam turbine components.

Course Title	Mechanics of Materials
Course Code	21AE44
Course outcomes (COs) : At the end of the course the student will be able to:	
C211.1	Apply the fundamentals of stress and strain analysis to solve simple and compound stress problems.
C211.2	Illustrate Euler-Bernoulli beam theory and Apply the concepts of Shear Force Diagram, Bending Moment Diagram, Bending stresses and shearing stresses in beams
C211.3	Apply Double integration and Macaulay's method to determine deflection of

	beams and Utilize the concept of torsion of shafts to design shafts.
C211.4	Understand the principles of Virtual work and Energy Methods to solve structural problems
C211.5	Explain the different failure modes of materials by Fracture, Creep and Fatigue.

Course Title	Hydraulics and Pneumatics Lab
Course Code	21AEL46
Course outcomes (COs) : At the end of the course the student will be able to:	
C213.1	Operate the hydraulic and pneumatic components.
C213.2	Apply the suitable cylinders according to the applications.
C213.3	Appreciate the purpose of valves

Course Title	Management and Entrepreneurship
Course Code	18AE51
Course outcomes (COs) : At the end of the course the student will be able to:	
C301.1	Apply the basic principles and concepts of management and Distinguish different plans and steps in planning
C301.2	Understanding the concepts of organizing and staffing and illustrate the concepts of directing and controlling
C301.3	Illustrate the meaning, functions, types and roles of an entrepreneur and interpret the business ethics and social responsibilities of the business
C301.4	Explain in detail about the modern small business enterprise and describe various institutional supports for SSI.
C301.5	Understanding in detail about the Project management and explanation regarding the preparation of the project report, PERT and CPM.

Course Title	Aerodynamics-II
Course Code	18AE52
Course outcomes (COs) : At the end of the course the student will be able to:	
C302.1	Apply the essential facts, concepts and principles of compressible flows
C302.2	Utilize the concepts of normal shock phenomenon
C302.3	Analyze the concepts of oblique shock and expansion waves
C302.4	Acquire the knowledge of differential equations of motion, governing Compressible flows.
C302.5	Measure the parameters of high speed flows.

Course Title	Aircraft Structures-I
Course Code	18AE53
Course outcomes (COs) : At the end of the course the student will be able to:	
C303.1	Design machine components for static strength.
C303.2	Design machine components for impact and fatigue strength.
C303.3	Identify appropriate materials for suitable application based on properties and loads on aircraft
C303.4	Apply the basics of theory of elasticity and solving statically determinate and Indeterminate structures.
C303.5	Design columns and Use the concept of Energy methods to solve structural members.

Course Title	Introduction To Composite Materials
Course Code	18AE54
Course outcomes (COs) : At the end of the course the student will be able to:	
C304.1	Understand the basic Classification of composite materials based on matrix and reinforcements
C304.2	Select a suitable manufacturing process based on the required properties
C304.3	Evaluate the micro- and macro-mechanical behavior of composite laminates
C304.4	Apply the failure theories of composite materials in composite modeling and analysis
C304.5	Demonstrate the NDT, DT tests of the composite materials and summarize the application of composites automobile, aeronautics, aerospace, marine, electrical, electronics and sports industry.

Course Title	Aircraft Systems & Instrumentation
Course Code	18AE55
Course outcomes (COs) : At the end of the course the student will be able to:	
C305.1	Describe and use of flight control systems
C305.2	Working principle of hydraulic and Pneumatic systems
C305.3	Explain the working of fuel, engine, environment control and emergency systems of a commercial aircraft
C305.4	Illustrate the basic aircraft instruments and air data instruments.
C305.5	Explain the use of gyroscope and engine instruments of aircraft.

Course Title	Theory of Vibration
Course Code	18AE56
Course outcomes (COs) : At the end of the course the student will be able to:	
C306.1	Understand the complete insight of Air transportation system.
C306.2	Explore the knowledge about basic aircraft characteristics, cabin design and manufacturers.
C306.3	Illustrate the detailed structure Airlines, Airports and its Infrastructure
C306.4	Understand the different air navigation and environmental systems used for improving the ATS
C306.5	List the Managerial aspects of Airlines

Course Title	Aerodynamics Lab
Course Code	18AEL57
Course outcomes (COs) : At the end of the course the student will be able to:	
C307.1	Apply the flow visualization techniques over different bodies to visualize the flow pattern at different angles of incidence.
C307.2	Determine the pressure distribution over 2d aerofoil, and cylindrical surfaces.
C307.3	Estimate the aerodynamic coefficients over cambered aerofoil and using surface pressure distributions.
C307.4	Evaluate the boundary layer thickness and total drag force over different bodies using wake probe techniques.

Course Title	Energy Conversion & Fluid Mechanics Lab
Course Code	18AEL58

Course outcomes (COs) : At the end of the course the student will be able to:	
C308.1	Determine the flash point, fire point and viscosity of lubricating oils.
C308.2	Determine the calorific value of fuels.
C308.3	Experiment with IC engines, opening and closing of valves to draw the valve-timing diagram.
C308.4	Demonstrate various flow meters and the concept of fluid mechanics.

Course Title	Aircraft Performance
Course Code	18AE61
Course outcomes (COs) : At the end of the course the student will be able to:	
C310.1	Understand Equations of motion for unaccelerated steady flight.
C310.2	Develop the equation for the steady performance of level, climb and glide flight
C310.3	Calculate the Range and Endurance of propeller driven and jet driven airplanes
C310.4	Enumerate aircraft performance like takeoff, and landing of accelerated Flight
C310.5	Understand the V-n diagram and calculate the Maneuver performance of the accelerated Flight

Course Title	Aircraft Structures-II
Course Code	18AE62
Course outcomes (COs) : At the end of the course the student will be able to:	
C311.1	Utilize the concepts of bending and shear of thin walled beams
C311.2	Apply the concept of Structural Idealization and solve problems on combined open and closed section beams
C311.3	Comprehend the principles of buckling of plates and design of Joints and fittings
C311.4	Determine stresses in wing Spars and Box beams.
C311.5	Apply the concepts of Stress analysis in Fuselage Frames.

Course Title	Finite Element Method
Course Code	18AE63
Course outcomes (COs) : At the end of the course the student will be able to:	
C312.1	Understand the basic concepts, background of FEA and approximate solution methods.
C312.2	Evaluate the effects of different loading and boundary conditions for bar, beam truss and frames.
C312.3	Formulate shape functions for two and three dimensional elements
C312.4	Comprehend the theory of isoparametric elements and formulate axisymmetric elements
C312.5	Apply the governing equations of heat transfer for finite element analysis of heat transfer problems and understand Hamilton's principle for dynamic analysis.

Course Title	Gas Turbine Technology
Course Code	18AE644
Course outcomes (COs) : At the end of the course the student will be able to:	
C313A.1	Illustrate the energy distribution of turbojet, turboprop and turbofan engines and comparison of various parameters with engine parts.
C313A.2	Illustrate various material manufacturing methods and the control systems used in the gas turbine engines.
C313A.3	Evaluate the performance of gas turbine engines at various conditions and a case study.
C313A.4	Evaluate the performance of compressor, combustor, turbines, inlet duct and nozzles in various conditions of the engines.

C313A.5	Estimate the life of engine by testing under different working conditions using various instrumentation.
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Course Title	Basics of Rockets and Missiles
Course Code	18AE653
Course outcomes (COs) : At the end of the course the student will be able to:	
C314A.1	Introduce the concepts of rocket engines and its application in space mission
C314A.2	Study the solid and liquid rocket motor Systems
C314A.3	Compute various types of aerodynamic forces acting on the rocket and missile during the flight
C314A.4	Acquire the knowledge on launch vehicle dynamics and attitude control
C314A.5	To understand the types of Rocket Testing and judge the materials for rocket and missile components

Course Title	Aircraft Propulsion Lab
Course Code	18AEL66
Course outcomes (COs) : At the end of the course the student will be able to:	
C315.1	Understand the working procedure of piston engine, Gas Turbine Engine
C315.2	Evaluate the calorific value of the fuel provided and heat transfer rate of the provided metal plate.
C315.3	Experiment the flow over nozzle and free jet & wall jet to determine the flow properties
C315.4	Estimate the pressure distribution over airfoil and thrust generated.

Course Title	Aircraft Structures Lab
Course Code	18AEL67
Course outcomes (COs) : At the end of the course the student will be able to:	
C316.1	Compute the deflection of simply supported beam and cantilever beam
C316.2	Verify the Maxwell's Reciprocal Theorem and Determine Young's Modulus, Poisson ratio using strain gauges
C316.3	Determine the buckling load of slender Eccentric Columns, shear failure and shear center of Bolted and Riveted Joints
C316.4	Understand the fundamental frequency and spectrum analysis, Fault detection and delamination studies in composite plate and vibration induced structural damage.

Course Title	Mini-project
Course Code	18AEMP68
Course outcomes (COs) : At the end of the course the student will be able to:	
C317.1	Formulate a design for creating a solution of the research plan identified
C317.2	Demonstrate effective project execution and control techniques that result in successful projects
C317.3	Demonstrate an ability to present and defend their research work to a panel of experts with enhanced interpersonal and communications skills
C317.4	Ability to write an original project report that has a clear, coherent argument, logical structure, correct grammar and proper references

Course Title	Aircraft Stability and Control
Course Code	18AE71

Course outcomes (COs) : At the end of the course the student will be able to:	
C401.1	Understand the contribution of various airframe components on longitudinal static stability in stick fixed condition and responses required from control surfaces to overcome sudden aerodynamic unbalancing.
C401.2	Evaluate stick force required at stick free condition and understand the basic concepts of static directional stability.
C401.3	Predict aileron control forces and flying modes such as Dutch roll, spiral roll, phugoid, long period oscillation with the help of Routh's criterion, for a given stability equation.
C401.4	Estimate the dynamic derivatives for forward speed, pitching velocity, time rate of change of angle of attack, rolling rate and yawing rate.
C401.5	Develop various inter-coupling effects with the motion of aircraft and Examine the response of an aircraft

Course Title	Computational Fluid Dynamics
Course Code	18AE72
Course outcomes (COs) : At the end of the course the student will be able to:	
C402.1	Understand the basics of CFD and Governing Equations
C402.2	Describe the mathematical behavior of PDE in fluid flow and discretization techniques.
C402.3	Paraphrase types of grid and its generation techniques
C402.4	Summarize grid transformation and advanced CFD techniques to solve complex CFD problems.
C402.5	Interpret FVM approach to solve CFD problems

Course Title	Control Engineering
Course Code	18AE732
Course outcomes (COs) : At the end of the course the student will be able to:	
C403A.1	Summarize basic concepts of control systems and mathematical models
C403A.2	Apply the knowledge of block diagrams , signal flow graphs and time response analysis for various inputs
C403A.3	Determine the system stability using Root locus plots and apply the concepts of frequency response analysis using Bode Plot
C403A.4	Analyze the frequency/time response using polar plots and Nyquist Criteria
C403A.5	Summarize the concepts of feedback control system and apply the state variable characteristics of Linear system

Course Title	Wind Tunnel Testing
Course Code	18AE742
Course outcomes (COs) : At the end of the course the student will be able to:	
C404A.1	Apply the principles and procedures model testing in the wind tunnel.
C404A.2	Classify the types and functions of wind tunnel.
C404A.3	Apply the concepts of calibrating techniques to calibrate the working parts and equipment of wind tunnel.
C404A.4	Distinguish the conventional measurement techniques and special wind tunnel

	techniques.
C404A.5	Describe the special wind tunnel techniques used in testing of models.

Course Title	Modeling and Analysis
Course Code	18AEL76
Course outcomes (COs) : At the end of the course the student will be able to:	
C405.1	Create the geometric models, mesh and carry out flow analysis over symmetric aerofoil/Unsymmetric aerofoils.
C405.2	Determine the flow characteristics over a diffuser and nozzle.
C405.3	Create a geometric model of 2d pipe and carry out thermal analysis.

Course Title	Flight Simulation Lab
Course Code	18AEL77
Course outcomes (COs) : At the end of the course the student will be able to:	
C406.1	Investigate Pole-Zero map of dynamic system model with plot customization option Simulate a bomb drop from an aircraft on a moving tank for pure –pursuit motion
C406.2	Simulate the oscillations for a spring-mass system and simple servo-mechanism feedback system in s and t domain
C406.3	Simulate stall of aircraft and show the effect of variation in static margin on stalling characteristics, aircraft longitudinal motion and demonstrate the effect of static margin variation for a doublet input in pitch
C406.4	Simulate a runway and a point take-off from a runway

Course Title	Project Work- Phase 1
Course Code	18AEP78
Course outcomes (COs) : At the end of the course the student will be able to:	
C407.1	Apply the knowledge, identify and Collect information to deduce a problem definition for project through detailed review.
C407.2	Identify applicable tools to implement and exhibit the proposed project

Course Title	Flight Vehicle Design
Course Code	18AE81
Course outcomes (COs) : At the end of the course the student will be able to:	
C408.1	Understand the importance of Conceptual Design process, wing loading, thrust to weight ratio concepts for flight vehicle design
C408.2	Interpret the concepts required for designing structural components of aircrafts like fuselage, wing and tail.
C408.3	Implement the concepts involved in engine selection & performance flight vehicle
C408.4	Analyze the static stability & control aspects of the aircraft
C408.5	Explain design aspects of different aircraft subsystems

Course Title	Avionics
Course Code	18AE821

Course outcomes (COs) : At the end of the course the student will be able to:	
C409A.1	Understand the need of avionics in civil, military systems, and use of different types of Power Distribution Systems and Inertial navigation Systems
C409A.2	Discuss the knowledge of Fly by wire system. Electronic Flight Instrument Systems, communication and its usage in aircrafts.
C409A.3	Discuss the knowledge of Electronic Flight Instrumentation System and Avionics subsystems
C409A.4	Summarize the knowledge of display technologies and use of microprocessors in aircrafts.
C409A.5	Classify the different avionics system architecture and select the suitable data bus based on the application and use of electronic warfare systems, radar systems

Course Title	Project work
Course Code	18AEP83
Course outcomes (COs) : At the end of the course the student will be able to:	
C410.1	Design and develop sustainable solution for the betterment of society
C410.2	Develop a feasible system with scope for future enhancements and continuous lifelong learning
C410.3	Effectively present the work with professional ethics as an individual or working as a team.

Course Title	Technical Seminar
Course Code	18AES86
Course outcomes (COs) : At the end of the course the student will be able to:	
C411.1	Demonstrate a sound technical knowledge of the selected seminar topic and ability to understand and utilize technical resources
C411.2	Exhibit effective communication skills, stage courage, and confidence
C411.3	Demonstrate an ability to speak and debate effectively during seminar to faculty examiners, panel of experts
C411.4	Ability to write technical documents related to the seminar presented

Course Outcomes (COs) of Department of Artificial Intelligence & Machine Learning

Course Title	Data Structures and Applications
Course Code	21CS32
Course outcomes (COs) : At the end of the course the student will be able to:	
C202.1	Identify different data structures and their applications.
C202.2	Apply stack and queues in solving problems.
C202.3	Demonstrate applications of linked list.
C202.4	Explore the applications of trees and graphs to model and solve the real-world problem.
C202.5	Make use of Hashing techniques and resolve collisions during mapping of key value pairs

Course Title	Analog and Digital Electronics
Course Code	21CS33
Course outcomes (COs) : At the end of the course the student will be able to:	
C203.1	Design and analyze application of analog circuits using photo devices, timer IC, power supply and regulator IC and op-amp.
C203.2	Explain the basic principles of A/D and D/A conversion circuits and develop the same.
C203.3	Simplify digital circuits using Karnaugh Map, and Quine-McClusky Methods.
C203.4	Explain Gates and flip flops and make us in designing different data processing circuits, registers and counters and compare the types.
C203.5	Develop simple HDL programs

Course Title	Computer Organization and Architecture
Course Code	21CS34
Course outcomes (COs) : At the end of the course the student will be able to:	
C204.1	Explain the organization and architecture of computer systems with machine instructions and programs
C204.2	Analyze the input/output devices communicating with computer system.
C204.3	Demonstrate the functions of different types of memory devices.
C204.4	Apply different data types on simple arithmetic and logical unit.
C204.5	Analyze the functions of basic processing unit, Parallel processing and pipelining.

Course Title	Object Oriented Programming with Java Laboratory
Course Code	21CSL35
Course outcomes (COs) : At the end of the course the student will be able to:	
C205.1	Use Eclipse/NetBeans IDE to design, develop, debug Java Projects.
C205.2	Analyze the necessity for Object Oriented Programming paradigm over structured programming and become familiar with the fundamental concepts in OOP.
C205.3	Demonstrate the ability to design and develop java programs, analyze, and interpret object-oriented data and document results.
C205.4	Apply the concepts of multiprogramming, exception/event handling, abstraction to develop robust programs.

Course Title	Mastering Office
Course Code	21CSL381
Course outcomes (COs) : At the end of the course the student will be able to:	
C208.1	Know the basics of computers and prepare documents, spreadsheets, make small presentations with audio, video and graphs and would be acquainted with internet.
C208.2	Create, edit, save and print documents with list tables, header, footer, graphic, spellchecker, mail merge and grammar checker.
C208.3	Attain the knowledge about spreadsheet with formula, macros spell checker etc.
C208.4	Demonstrate the ability to apply application software in an office environment.

Course Title	Complex Analysis, Probability and Statistical Methods
Course Code	21MAT41
Course outcomes (COs) : At the end of the course the student will be able to:	
C209.1	Use the concepts of an analytic function and complex potentials to solve the problems arising in electromagnetic field theory. Apply the concept of line integral to solve the problems on Cauchy theorem and Cauchy integrals.
C209.2	Understand the series solution of Bessel's and Legendre's differential equations and solve Legendre's polynomial equations.
C209.3	Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data.
C209.4	Apply discrete and continuous probability distributions to solve the probability models arising in the engineering field.
C209.5	Construct joint probability distributions occurring in digital signal processing. Demonstrate the validity of testing the hypothesis.

Course Title	Design And Analysis of Algorithms
Course Code	21CS42
Course outcomes (COs) : At the end of the course the student will be able to:	
C210.1	Analyze the performance of the algorithms, state the efficiency using asymptotic notations and analyze mathematically the complexity of the algorithm.
C210.2	Apply divide and conquer approaches and decrease and conquer approaches in solving the problems analyze the same.
C210.3	Apply the appropriate algorithmic design technique like greedy method, transform and conquer approaches and compare the efficiency of algorithms to solve the given problem.
C210.4	Apply and analyze dynamic programming approaches to solve some problems. and improve an algorithm time efficiency by sacrificing space.
C210.5	Apply and analyze backtracking, branch and bound methods and to describe P, NP and NP-Complete problems.

Course Title	Microcontroller and Embedded Systems
Course Code	21CS43
Course outcomes (COs) : At the end of the course the student will be able to:	
C211.1	Explain C-Compilers and optimization.
C211.2	Describe the ARM microcontroller's architectural features and program module.

C211.3	Apply the knowledge gained from programming on ARM to different applications.
C211.4	Program the basic hardware components and their application selection method.
C211.5	Demonstrate the need for a real-time operating system for embedded system applications.

Course Title	Operating Systems
Course Code	21CS44
Course outcomes (COs) : At the end of the course the student will be able to:	
C212.2	Demonstrate the allocation of resources for a process using scheduling algorithm.
C212.3	Identify root causes of deadlock and provide the solution for deadlock elimination.
C212.4	Explore about the storage structures and learn about the Linux Operating system.
C212.5	Analyze Storage Structures and Implement Customized Case study.
C212.2	Demonstrate the allocation of resources for a process using scheduling algorithm.

Course Title	Python Programming Laboratory
Course Code	21CSL46
Course outcomes (COs) : At the end of the course the student will be able to:	
C214.1	Demonstrate proficiency in handling of loops and creation of functions.
C214.2	Identify the methods to create and manipulate lists, tuples and dictionaries.
C214.3	Discover the commonly used operations involving regular expressions and file system.
C214.4	Interpret the concepts of Object-Oriented Programming as used in Python.

Course Title	Unix Shell Programming
Course Code	21CS482
Course outcomes (COs) : At the end of the course the student will be able to:	
C216.1	Describe the fundamentals of Unix Operating System concept and commands.
C216.2	Illustrate how Unix File System works & its architecture
C216.3	Write Unix commands & Scripts to perform various operations on Unix File Systems.
C216.4	Write advanced Unix commands to perform various Unix Process operations.

Course Title	Management and Entrepreneurship for IT Industry
Course Code	18CS51
Course outcomes (COs) : At the end of the course the student will be able to:	
C301.1	Understand the meaning, scope, development of management thoughts and to analyze the objectives of planning process, types of organization and staffing
C301.2	Understand the meaning of directing, Leadership styles, motivation theories, communication and to establish controlling methods
C301.3	Understand the meaning and function of Entrepreneur, the role of Entrepreneur in the economic development and to identify business opportunities along with feasibility studies
C301.4	Understand the procedure to prepare project report and to study Enterprise Resource Planning
C301.5	Understand the Micro and small enterprise and to Infer the importance of

	intellectual properties rights and relate the institutional support
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Course Title	Python Programming
Course Code	18AI52
Course outcomes (COs) : At the end of the course the student will be able to:	
C302.1	Demonstrate proficiency in handling of loops and creation of functions
C302.2	Identify the methods to create and manipulate lists, tuples and dictionaries
C302.3	Discover the commonly used operations involving regular expressions and file system
C302.4	Interpret the concepts of Object-Oriented Programming as used in python
C302.5	Determine the need for scraping websites and working with CSV,JSON and other file formats

Course Title	Database Management Systems
Course Code	18CS53
Course outcomes (COs) : At the end of the course the student will be able to:	
C303.1	Apply fundamental of database concept and entity relationship model in database applications.
C303.2	Design a database using RDBMS and use this for database applications.
C303.3	Design and develop database and database in Internet Applications.
C303.4	Design database using normalization.
C303.5	Understanding the transaction processing and recovery methods in database.

Course Title	Automata Theory and Computability
Course Code	18CS54
Course outcomes (COs) : At the end of the course the student will be able to:	
C304.1	Apply the knowledge of theory of computation to design DFSM, NFSM for a given problem
C304.2	Apply regular expressions and regular grammar for a given language
C304.3	Identify context free grammar and designs PDA for given problem
C304.4	Apply the properties of CFL in Language processing and debugging of Turing machine model for the given language
C304.5	Demonstrate the variety of Turing machine and classify the problems with respect to different mode of computations

Course Title	Principles of Artificial Intelligence
Course Code	18AI55
Course outcomes (COs) : At the end of the course the student will be able to:	
C305.1	Apply various AI Based problem solving technique for solving search problems.
C305.2	Implement various problem reduction and game playing strategies for complicated problems.
C305.3	Carry out proofs in propositional and predicate logic using techniques such as resolution, unification, backward and forward chaining.
C305.4	Describe and implement various planning strategies.
C305.5	Represent knowledge using various technique like semantic networks & frames to

	understand the concept of expert system.
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Course Title	Mathematics for Machine Learning
Course Code	18AI56
Course outcomes (COs) : At the end of the course the student will be able to:	
C306.1	Improve the skills and knowledge in linear algebra to get more out of machine learning.
C306.2	Understand the vector calculus required to build many common machine learning techniques.
C306.3	Learn the probability and distribution in statistics to build machine learning applications.
C306.4	Learn the basic theoretical properties of optimization problems, for applications in machine learning

Course Title	Artificial Intelligence Laboratory
Course Code	18AIL57
Course outcomes (COs) : At the end of the course the student will be able to:	
C307.1	Implement and demonstrate AI algorithms.
C307.2	Implement problem solving strategies
C307.3	Implement predicate logic and do resolution
C307.4	Implement Game playing strategies

Course Title	DBMS Laboratory with mini project
Course Code	18CSL58
Course outcomes (COs) : At the end of the course the student will be able to:	
C308.1	Apply fundamental of database concept and entity relationship model in database applications.
C308.2	Design a database using RDBMS and use this for database applications.
C308.3	Design and develop database and database in Internet Applications.
C308.4	Design database using normalization.
C308.5	Understanding the transaction processing and recovery methods in database.

Course Title	Machine Learning
Course Code	18AI61
Course outcomes (COs) : At the end of the course the student will be able to:	
C310.1	Describe the basic fundamentals of Concept Learning & Machine Learning and designing a learning system
C310.2	Perform various data preprocessing tasks and illustrate the workflow of Machine learning based classification tasks.
C310.3	Apply various machine learning models for regression analysis and classification tasks and analyze the performance of models.
C310.4	Inspect the logic of Bayes Theorem and assess its applications on various machine learning tasks.

Course Title	Digital Image Processing
Course Code	18AI62

Course outcomes (COs) : At the end of the course the student will be able to:	
C311.1	Understand, Ascertain and describe the basics of image processing concepts through mathematical interpretation.
C311.2	Conduct independent study and analysis of Image Enhancement techniques. Apply image processing techniques in both the spatial and frequency (Fourier) domains.
C311.3	Demonstrate image restoration process and its respective filters required.
C311.4	Realize the fundamentals of colour Image processing, Wavelets and Morphological Operations used in digital image processing
C311.5	Design image analysis techniques in the form of image segmentation and to evaluate the Methodologies for segmentation.

Course Title	Java for Mobile Applications
Course Code	18AI63
Course outcomes (COs) : At the end of the course the student will be able to:	
C312.1	Discuss advanced Java concepts like enumerations, Autoboxing, and annotations.
C312.2	To implement various data structures by using Java Collection framework, synchronize with legacy classes and apply methods to sort objects by using a functional interface Comparator.
C312.3	To understand the concept of string and its operations. To implement various string handling methods in Java
C312.4	To understand the fundamentals of the Android development framework. To implement inter-component communication using fragments and user interface design using intents.
C312.5	To create the look and feel of the app using various Android user interface elements. To understand SQLite database commands in order to develop an application using it.

Course Title	Natural Language Processing
Course Code	18AI641
Course outcomes (COs) : At the end of the course the student will be able to:	
C313A.1	Analyze the natural language text
C313A.2	Define the importance of natural language
C313A.3	Understand the concepts Text mining
C313A.4	Illustrate information retrieval techniques

Course Title	Digital Image Processing Laboratory with mini project
Course Code	18AIL67
Course outcomes (COs) : At the end of the course the student will be able to:	
C315.1	Understand the basic knowledge Image Segmentation algorithm development
C315.2	Image filtering in spatial and frequency domain.
C315.3	Able to demonstrate the working of different concepts of Morphological operations in analyzing image structures

Course Title	Mobile Application Development Laboratory
Course Code	18AIMP68
Course outcomes (COs) : At the end of the course the student will be able to:	
C316.1	Create, test and debug Android application by setting up Android development environment and implement adaptive, responsive user interfaces that work across a wide range of devices
C316.2	Infer long running tasks and background work in Android applications.
C316.3	Demonstrate methods in storing, sharing and retrieving data in Android applications.
C316.4	Describe the role of permissions and security for Android applications.

Course Outcomes (COs) of Department of Civil Engineering

Course Title	Transform Calculus, Fourier series & Numerical Techniques
Course Code	21MAT31
Course outcomes (COs) : At the end of the course the student will be able to:	
C201.1	Solve ordinary differential equations using Laplace transform.
C201.2	Demonstrate the Fourier series to study the behaviour of periodic functions and their applications in system communications, digital signal processing and field theory.
C201.3	Make use of Fourier transforms to analyze problems involving continuous-time signals and to apply Z-Transform techniques to solve difference equations
C201.4	Solve mathematical models represented by initial or boundary value problems involving partial differential equations
C201.5	Determine the extremals of functionals using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis.

Course Title	Geodetic Engineering
Course Code	21CV32
Course outcomes (COs) : At the end of the course the student will be able to:	
C202.1	Develop a sound knowledge of fundamental principles of Geodetics and Measure of vertical and horizontal plane, linear and angular dimensions to arrive at solutions to basic surveying problems, Advantages
C202.2	Analyze the obtained spatial data and compute areas and volumes. Types of leveling and its application
C202.3	Utilize geodetic data to process and perform analysis for survey problems using tachometric method
C202.4	Design and Implement different types of curves for Deviating types of alignments
C202.5	Uses of Modern surveying instruments and apply the knowledge of GIS in transportation and town planning and scale of the vertical and tilted photographs in aerial photography

Course Title	Strength of Materials
Course Code	21CV33
Course outcomes (COs) : At the end of the course the student will be able to:	
C203.1	Evaluate the behaviour when a solid material is subjected to various types of forces (namely Compressive, Tensile, Thermal, Shear, flexure, Torque, internal fluid pressure) and estimate stresses and corresponding strain developed.
C203.2	Estimate the forces developed and draw schematic diagram for stresses, forces, moments for simple beams with different types of support and are subjected to various types of loads
C203.3	Evaluate the behaviour when a solid material is subjected to Torque and internal fluid pressure and estimate stresses and corresponding strain developed
C203.4	Distinguish the behaviour of short and long column and calculate load at failure & explain the behaviour of spring to estimate deflection and stiffness
C203.5	Examine and Evaluate the mechanical properties of various materials under different loading conditions

Course Title	Earth Resources and Engineering
Course Code	21CV34
Course outcomes (COs) : At the end of the course the student will be able to:	
C204.1	Apply geological knowledge its role in Civil Engineering Practice.

C204.2	Utilize the knowledge on durability and competence of foundation rocks, and confidence enough to use the best building materials.
C204.3	Plan enough for the safety, stability, economy and life of the structures that they construct.
C204.4	Assess to solve various issues related to ground water exploration, build up dams, bridges, tunnels which are often confronted with ground water problems.
C204.5	Make Use of GIS, GPS, GPR, Drone and remote sensing as a latest tool in different civil engineering for safe and solid construction.

Course Title	Computer Aided Building Planning and Drawing
Course Code	21CVL35
Course outcomes (COs) : At the end of the course the student will be able to:	
C205.1	Make Use of the fundamental features of AutoCAD
C205.2	Make Use of the precision drafting tools in to develop accurate technical drawings
C205.3	Outline a broad understanding of various structural elements of buildings
C205.4	Develop, read and interpret the drawings various components of civil engineering structures in a detailed and visually impressive manner and professional set up.
C205.5	Plan and design a residential or public building as per the given requirements, develop submission of drawings for building along with knowing the procedures for submission of drawings

Course Title	Fire safety in buildings
Course Code	21CV385
Course outcomes (COs) : At the end of the course the student will be able to:	
C208.1	Understand the different classification of fire system , combustion process and design fire resistance structures
C208.2	Plan for fire safety and design of lifts
C208.3	Design of water supply system and water flow network system of fresh water to buildings
C208.4	Design of electrical systems and maintenance of buildings
C208.5	Perform health evaluation of buildings and suggest remedies

Course Title	Complex Analysis, Probability and Statistical Methods
Course Code	21MAT41
Course outcomes (COs) : At the end of the course the student will be able to:	
C.209.1	Use the concepts of an analytic function and complex potentials to solve the problems arising in electromagnetic field theory. Apply the concept of line integral to solve the problems on Cauchy theorem and Cauchy integrals.
C.209.2	Understand the series solution of Bessel's and Legendre's differential equation and solve Legendre's polynomial equations
C.209.3	Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data.
C.209.4	Apply discrete and continuous probability distributions to solve the probability models arising in the engineering field.
C.209.5	Construct joint probability distributions occurring in digital signal processing. Demonstrate the validity of testing the hypothesis.

Course Title	Fluid Mechanics and Hydraulics
Course Code	21CV42

Course outcomes (COs) : At the end of the course the student will be able to:	
C210.1	Understand fundamental properties of fluids and solve problems on Hydrostatics
C210.2	Apply Principles of Mathematics to represent Kinematics and Bernoulli's principles
C210.3	Compute discharge through pipes, notches and weirs
C210.4	Design of open channels of various cross sections
C210.5	Design of turbines for the given data and understand their operation characteristics

Course Title	Public Health Engineering
Course Code	21CV43
Course outcomes (COs) : At the end of the course the student will be able to:	
C211.1	Analyze the variation of water demand and to estimate water requirement for a Community.
C211.2	Evaluate water quality and environmental significance of various parameters and plan suitable treatment system for a community.
C211.3	Analyze the different characteristics of wastewater and to understand the different treatment units.
C211.4	Choose the different components of sewer networks and methods of disposal of treated effluents.
C211.5	Choose the various biological treatment units and low cost treatment units for sanitation.

Course Title	Analysis of Structures
Course Code	21CV44
Course outcomes (COs) : At the end of the course the student will be able to:	
C212.1	Evaluate slope and deflections in beams using geometrical methods.
C212.2	Determine deflections in trusses and frames using energy principles.
C212.3	Analyze arches and cables for stress resultants.
C212.4	Apply slope deflection method in analyzing indeterminate structures and construct bending moment diagram.
C212.5	Analyze continuous beams, frames and trusses using stiffness matrix method of analysis

Course Title	Earth Resources Engineering lab
Course Code	21CVL46
Course outcomes (COs) : At the end of the course the student will be able to:	
C214.1	Apply geological knowledge its role in Civil Engineering Practice.
C214.2	Utilize the knowledge on durability and competence of foundation rocks, and confidence enough to use the best building materials.
C214.3	Plan enough for the safety, stability, economy and life of the structures that they construct.
C214.4	Assess to solve various issues related to ground water exploration, build up dams, bridges, tunnels which are often confronted with ground water problems.
C214.5	Make Use of GIS, GPS, GPR, Drone and remote sensing as a latest tool in different civil engineering for safe and solid construction.

Course Title	Green Buildings
Course Code	21CV485
Course outcomes (COs) : At the end of the course the student will be able to:	
C212.1	Choose different building materials for construction
C212.2	Apply effective environmental friendly building technology
C212.3	Analyze global warming due to different materials in construction
C212.4	Analyze the green building rating system
C212.5	Utilize alternate source of energy and effective use of waste water

Course Title	Construction Management & Entrepreneurship
Course Code	18CV51
Course outcomes (COs) : At the end of the course the student will be able to:	
C301.1	Apply the construction management process and development of project plan.
C301.2	Build the skills needed to manage human resources and materials.
C301.3	Solve variety of issues that are encountered by professional in discharging professional duties.
C301.4	Make use of the role of economics in the decision making process and perform the calculations in regard to interest formulas.
C301.5	Apply the professional obligations effectively with global outlook.

Course Title	Analysis of Indeterminate Structures
Course Code	18CV52
Course outcomes (COs) : At the end of the course the student will be able to:	
C302.1	Determine the moment in indeterminate beams and frames of varying cross section using slope deflection method.
C302.2	Determine the moment in indeterminate beams and frames of no sway and sway using moment distribution method.
C302.3	Analyze the beams and frames by Kani's method.
C302.4	Analyze the beams and frames using flexibility matrix method.
C302.5	Analyze the beams and indeterminate frames using stiffness matrix method.

Course Title	Design of RC Structural Elements
Course Code	18CV53
Course outcomes (COs) : At the end of the course the student will be able to:	
C303.1	Explain the design philosophy and principles.
C303.2	Solve the engineering problems of RC elements subjected to flexure, shear and torsion.
C303.3	Adapt the procedural knowledge in designs of RC structural elements such as beams and slabs.
C303.4	Utilize the concept of design of RC structural elements such as slabs and staircase for different cases.
C303.5	Utilize the concept of design of RC structural elements such as Column & footings. Also Utilize professional and ethical responsibility in the direction of safe and economic structures

Course Title	Basic Geotechnical Engineering
Course Code	18CV54
Course outcomes (COs) : At the end of the course the student will be able to:	
C304.1	Make use of the procedures to determine index properties of any type of soil, classify and list the soil based on its index properties
C304.2	Determine compaction characteristics of soil and apply that knowledge to assess field compaction procedures
C304.3	Estimate permeability property of soils and acquires conceptual knowledge about stresses due to seepage and effective stress; Also acquire ability to estimate seepage losses across hydraulic structure
C304.4	Evaluate shear strength parameters of different types of soils using the data of different shear tests and comprehend Mohr-Coulomb failure theory.
C304.5	Solve practical problems related to estimation of consolidation settlement of soil deposits also time required for the same financing concepts.

Course Title	Municipal Wastewater Engineering
Course Code	18CV55
Course outcomes (COs) : At the end of the course the student will be able to:	
C305.1	Select the appropriate sewer appurtenances and materials in sewer network.
C305.2	Design the different components of sewer networks and methods of disposal of treated effluents.
C305.3	Analyze the different characteristics of wastewater and to understand the different treatment units.
C305.4	Design the various biological treatment units
C305.5	Design various Advanced Oxidation Process (AOPs) and low cost treatment units for rural sanitation.

Course Title	Highway Engineering
Course Code	18CV56
Course outcomes (COs) : At the end of the course the student will be able to:	
C306.1	Make use of the knowledge of highway development programs and the concepts of selection of various alternative proposals.
C306.2	Make use of the concepts of various surveys for proposing new alignment and realignment projects and design of road geometrics.
C306.3	Evaluate the engineering properties of the materials and suggest the suitability of the same for pavement construction and Design structural components of pavement and drainage.
C306.4	Apply knowledge on Mix Design of soil aggregate mixes and Pavement Construction methodology in construction
C306.5	Evaluate the highway economics by few select methods and also will have a basic knowledge of various highway financing concepts.

Course Title	Surveying Practice
Course Code	18CVL57
Course outcomes (COs) : At the end of the course the student will be able to:	

C307.1	Apply the basic principles of engineering surveying for linear measurements.
C307.2	Use the compass to measure magnetic bearings and carry out traversing.
C307.3	Perceive effectively field procedures required for a professional surveyor to carry out levelling process.
C307.4	Use of instruments like theodolite to measure horizontal and vertical angles and conventional surveying instruments necessary for engineering practice.

Course Title	Concrete & Highway Materials Laboratory
Course Code	18CVL58
Course outcomes (COs) : At the end of the course the student will be able to:	
C308.1	Examine the quality and suitability of cement for construction work
C308.2	Analyze appropriate concrete mix and Determine strength and quality of concrete
C308.3	Make use of knowledge acquired on road aggregates and bitumen for their suitability as road material.
C308.4	Determine the suitability of soil as sub grade materials.

Course Title	Design of Steel Structural Elements
Course Code	18CV61
Course outcomes (COs) : At the end of the course the student will be able to:	
C310.1	Utilize the knowledge of steel structures, Advantages and Disadvantages of steel structures, steel code provisions and plastic behaviour of structural steel
C310.2	Make use of the concept of bolted and welded connections, failure mechanisms and to design against the failures
C310.3	Design of compression members, built-up columns and columns splices across different practical situations
C310.4	Design the tension members, simple slab base and gusseted base
C310.5	Utilize the concept of laterally supported and un-supported steel beams and its design

Course Title	Applied Geotechnical Engineering
Course Code	18CV62
Course outcomes (COs) : At the end of the course the student will be able to:	
C311.1	Plan and execute geotechnical site investigation program for different civil engineering projects.
C311.2	Analyze the stress distribution and compute settlement in various types of soils.
C311.3	Estimate factor of safety against failure of slopes and to compute lateral pressure distribution behind earth retaining structures
C311.4	Determine bearing capacity of soil and to achieve proficiency in proportioning various types of footing
C311.5	Estimating load carrying capacity of single and group of piles

Course Title	Hydrology and Irrigation Engineering
Course Code	18CV63
Course outcomes (COs) : At the end of the course the student will be able to:	

C312.1	Describe hydrologic cycle and analyse the rainfall data
C312.2	Compute the losses from precipitation
C312.3	Develop rainfall - runoff relationship analyse the hydrographs and their components
C312.4	Interpret the basic requirements of irrigation, crops and various irrigation techniques
C312.5	Discuss the methodology of computing the canal capacity, and reservoir capacity

Course Title	Alternative Building Materials
Course Code	18CV643
Course outcomes (COs) : At the end of the course the student will be able to:	
C313A.1	Solve the problems of Environmental issues concerned to building materials and cost effective building technologies
C313A.2	Identify appropriate type of masonry unit and mortar, design of structural masonry under axial compression.
C313A.3	Identify the various alternative building materials and suggest agro and industrial wastes in manufacturing of building.
C313A.4	Recommend various types of alternative building technologies and design of energy efficient building by considering local climatic condition and building material.
C313A.5	Identify new technologies for manufacture of alternative building materials and Suggest basic cost saving techniques in planning, design and construction.

Course Title	Remote Sensing & GIS
Course Code	18CV651
Course outcomes (COs) : At the end of the course the student will be able to:	
C314A.1	Make use of data and delineate various elements from the satellite imagery using their spectral signature.
C314A.2	Analyze different features of ground information to create raster or vector data.
C314A.3	Take part in digital classification and create different thematic maps for solving specific problems.
C314A.4	Build decision based GIS analysis on thematic maps for planning & management.
C314A.5	Apply the modern tool of Remote Sensing and GIS in Natural Resource Management

Course Title	Software Application Laboratory
Course Code	18CVL66
Course outcomes (COs) : At the end of the course the student will be able to:	
C315.1	Make use of the industry software in professional setup for analysis and design of a structures
C315.2	Understand the elements of finite element modelling, specifications of loads and boundary conditions, performing and interpretation of results for final design
C315.3	Interpreting topographical map to study the features of the area using QGIS and Google earth
C315.4	Develop customized automation tools using excel for various civil engineering projects

Course Title	Environmental Engineering Laboratory
Course Code	18CVL67
Course outcomes (COs) : At the end of the course the student will be able to:	
C316.1	Acquire capability to conduct experiments and estimate the concentration of different parameters.
C316.2	Determine the chemical, physical and biological characteristics of water and wastewater.
C316.3	Determine the optimum dosage of coagulant, Residual chlorine and available chlorine
C316.4	Determination of Nitrates and Iron by Spectrophotometer.

Course Title	Extensive Survey Project /Camp
Course Code	18CVP68
Course outcomes (COs) : At the end of the course the student will be able to:	
C317.1	Apply skills to handle conventional & modern surveying equipments for location of objects and setting out works.
C317.2	Interpret and analyze data to prepare drawings and reports of engineering projects like water supply, highway and irrigation and town planning.
C317.3	Apply the technical difficulties at site and managerial skills to tackling them in completing the assigned survey work.
C317.4	Function as a team member imparting networking, communicating effectively in gaining lifelong learning process.

Course Title	Quantity Surveying and Contracts Management.
Course Code	18CV71
Course outcomes (COs) : At the end of the course the student will be able to:	
C401.1	Student able to determine the quantity calculation of various components of building and its cost Analysis.
C401.2	To determine the volume of earthwork by various approaches for roads, Canals & hilly areas and also quantity calculation of steel truss, Manhole and Septic tank.
C401.3	Student able to calculate rate analysis for various items of buildings and clear knowledge about Specification.
C401.4	Student able to know tender and its process, also various contract form and types of contracts.
C401.5	Knowledge about the various type of contract management and valuation it's process.

Course Title	Design of RCC & Steel structure
Course Code	18CV72
Course outcomes (COs) : At the end of the course the student will be able to:	
C402.1	Adapt the procedural knowledge in design of RC retaining wall & combined footing.
C402.2	Follow design procedure as per codal provision & skill to drive at structural safe & roof truss as per codal procedure.

C402.3	Analyse & design of welded plate girder & roof truss as per codal provision.
C402.4	Design of gantry girder with all necessary check.
C402.5	Provide factual knowledge on analysis and design of RC Structural elements, who can participate and succeed in competitive examinations.

Course Title	Air Pollution Control
Course Code	18CV732
Course outcomes (COs) : At the end of the course the student will be able to:	
C403A.1	Examine different types of air pollutants, explain their dispersion and effect on environment.
C403A.2	Compare emission rate of pollution from transport and industry, theory of dispersion model.
C403A.3	Assess air quality management, relevant standard and regulations.
C403A.4	Identify particulates control by different methods.
C403A.5	List causes, effects and control of noise pollution.

Course Title	Urban Transportation and Planning
Course Code	18CV745
Course outcomes (COs) : At the end of the course the student will be able to:	
C404A.1	Identify the different types of transportation systems and urban transportation planning.
C404A.2	Design, conduct and administer surveys to provide the data required for transportation planning.
C404A.3	Supervise the process of data collection about travel behaviour and analyse the data for use in transport planning.
C404A.4	Develop and calibrate modal split, trip generation rates for specific types of land use developments.
C404A.5	Adapt the steps that are necessary to complete a long term transportation planning.

Course Title	Environmental Protection and Management
Course Code	18CV753
Course outcomes (COs) : At the end of the course the student will be able to:	
C405A.1	Appraise the elements of Corporate Environmental Management systems complying with international environmental management system standards.
C405A.2	Adapt to Lead pollution prevention assessment team and implement waste minimization options.
C405A.3	Choose, Legal environmental policy implementation, monitoring, review to prevent pollution
C405A.4	Develop, Implement, maintain and Audit Environmental Management systems for Organizations.

C405A.5	Adapt, waste audits and prevention of pollution in the various industries to adopt environmental protection management system.
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Course Title	Computer Aided Detailing of Structures
Course Code	18CVL76
Course outcomes (COs) : At the end of the course the student will be able to:	
C406.1	Create structural drawings of different components of the buildings
C406.2	Create structural drawings of retaining wall & water tanks
C406.3	Interpret the design data to draw connection details, built up sections and column bases
C406.4	Create the structural drawings of roof truss & girder

Course Title	Geotechnical Engineering Lab
Course Code	18CVL77
Course outcomes (COs) : At the end of the course the student will be able to:	
C407.1	Experiment with laboratory tests and to identify soil as per IS code procedures and to determine index properties of soil.
C407.2	Classify the soil and determine its permeability
C407.3	Determine OMC and density to asses field compaction
C407.4	Determine shear strength and consolidation parameters to asses strength and deformation characteristics

Course Title	Project Work
Course Code	18CVP78
Course outcomes (COs) : At the end of the course the student will be able to:	
C408.1	Define the engineering problems then develop appropriate engineering knowledge, skills and technique to analyze and solve them.
C408.2	Perceive literature survey in the field of civil engineering to develop simple and innovative solutions.
C408.3	Choose effective and efficient tools and resources available to demonstrate and execute the work collaboratively as a professional engineer not affecting social, environmental and cultural impacts.

Course Title	Design of Pre Stressed Concrete Element
Course Code	18CV81
Course outcomes (COs) : At the end of the course the student will be able to:	
C409.1	Understand PSC members and requirements for present scenario.
C409.2	Understand the effectiveness of the PSC member design after studying losses.
C409.3	Analyze and Design of PSC member under flexure.
C409.4	Capable of analyzing the PSC elements under shear and finding its efficiency.
C409.5	Design anchorage for PSC beam and understand Composite Section.

Course Title	Pavement Design
Course Code	18CV825
Course outcomes (COs) : At the end of the course the student will be able to:	
C410A.1	Understand PSC members and requirements for present scenario.
C410A.2	Understand the effectiveness of the PSC member design after studying losses.
C410A.3	Analyze and Design of PSC member under flexure.
C410A.4	Capable of analyzing the PSC elements under shear and finding its efficiency.
C410A.5	Design anchorage for PSC beam and understand Composite Section.

Course Title	Project Work
Course Code	18CVP83
Course outcomes (COs) : At the end of the course the student will be able to:	
C411.1	Apply the methodology which brings out the project with well-defined conclusions.
C411.2	Build and present a clear and coherent presentation of the work to a arrange of technical and non-technical audience
C411.3	Develop a project report that has a clear, coherent argument, logical structure, correct grammar and project reference
C411.4	Develop knowledge in publishing the research work and communicate the ideas with the world
C411.5	Apply the methodology which brings out the project with well-defined conclusions.

Course Title	Technical Seminar
Course Code	18CVS84
Course outcomes (COs) : At the end of the course the student will be able to:	
C412.1	Demonstrate a sound technical knowledge of the selected seminar topic and ability to understand and utilize technical resources
C412.2	Demonstrate an ability to present ideas effectively during seminars, public presentations, to faculty examiners, panel of expert
C412.3	Demonstrate the ability to speck and debate with an appropriation for complex social and cultural sensibilities.
C412.4	Ability to write technical documents related to the work completed

Course Title	Internship
Course Code	18CVI85
Course outcomes (COs) : At the end of the course the student will be able to:	
C413.1	Apply appropriate knowledge and skills to identify, formulate, analyze and solve complex engineering problem.

C413.2	Make use of modern tools and processes to solve the engineering problems and learn social environmental responsibilities.
C413.3	Decide to work with professional ethics effectively as a member/leader and communicate effectively.
C413.4	Take part in project management and maintain their competency in the challenging work environment.
C413.5	Apply appropriate knowledge and skills to identify, formulate, analyze and solve complex engineering problem.

Course Outcomes (COs) of Department of Computer Science & Engineering

Course Title	Data Structures and Applications
Course Code	21CS32
Course outcomes (COs) : At the end of the course the student will be able to:	
C202.1	Identify different data structures and their applications.
C202.2	Apply stack and queues in solving problems.
C202.3	Demonstrate applications of linked list.
C202.4	Explore the applications of trees and graphs to model and solve the real-world problem.
C202.5	Make use of Hashing techniques and resolve collisions during mapping of key value pairs

Course Title	Analog and Digital Electronics
Course Code	21CS33
Course outcomes (COs) : At the end of the course the student will be able to:	
C203.1	Design and analyze application of analog circuits using photo devices, timer IC, power supply and regulator IC and op-amp.
C203.2	Explain the basic principles of A/D and D/A conversion circuits and develop the same.
C203.3	Simplify digital circuits using Karnaugh Map, and Quine-McClusky Methods.
C203.4	Explain Gates and flip flops and make us in designing different data processing circuits, registers and counters and compare the types.
C203.5	Develop simple HDL programs

Course Title	Computer Organization and Architecture
Course Code	21CS34
Course outcomes (COs) : At the end of the course the student will be able to:	
C204.1	Explain the organization and architecture of computer systems with machine instructions and programs
C204.2	Analyze the input/output devices communicating with computer system.
C204.3	Demonstrate the functions of different types of memory devices.
C204.4	Apply different data types on simple arithmetic and logical unit.
C204.5	Analyze the functions of basic processing unit, Parallel processing and pipelining.

Course Title	Object Oriented Programming with Java Laboratory
Course Code	21CSL35
Course outcomes (COs) : At the end of the course the student will be able to:	
C205.1	Use Eclipse/NetBeans IDE to design, develop, debug Java Projects.
C205.2	Analyze the necessity for Object Oriented Programming paradigm over structured programming and become familiar with the fundamental concepts in OOP.
C205.3	Demonstrate the ability to design and develop java programs, analyze, and interpret object-oriented data and document results.

C205.4	Apply the concepts of multiprogramming, exception/event handling, abstraction to develop robust programs.
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Course Title	Mastering Office
Course Code	21CSL381
Course outcomes (COs) : At the end of the course the student will be able to:	
C208.1	Know the basics of computers and prepare documents, spreadsheets, make small presentations with audio, video and graphs and would be acquainted with internet.
C208.2	Create, edit, save and print documents with list tables, header, footer, graphic, spellchecker, mail merge and grammar checker.
C208.3	Attain the knowledge about spreadsheet with formula, macros spell checker etc.
C208.4	Demonstrate the ability to apply application software in an office environment.
C208.1	Know the basics of computers and prepare documents, spreadsheets, make small presentations with audio, video and graphs and would be acquainted with internet.

Course Title	Design And Analysis of Algorithms
Course Code	21CS42
Course outcomes (COs) : At the end of the course the student will be able to:	
C210.1	Analyze the performance of the algorithms, state the efficiency using asymptotic notations and analyze mathematically the complexity of the algorithm.
C210.2	Apply divide and conquer approaches and decrease and conquer approaches in solving the problems analyze the same.
C210.3	Apply the appropriate algorithmic design technique like greedy method, transform and conquer approaches and compare the efficiency of algorithms to solve the given problem.
C210.4	Apply and analyze dynamic programming approaches to solve some problems. and improve an algorithm time efficiency by sacrificing space.
C210.5	Apply and analyze backtracking, branch and bound methods and to describe P, NP and NP-Complete problems.

Course Title	Microcontroller and Embedded Systems
Course Code	21CS43
Course outcomes (COs) : At the end of the course the student will be able to:	
C211.1	Explain C-Compilers and optimization.
C211.2	Describe the ARM microcontroller's architectural features and program module.
C211.3	Apply the knowledge gained from programming on ARM to different applications.
C211.4	Program the basic hardware components and their application selection method.
C211.5	Demonstrate the need for a real-time operating system for embedded system applications.

Course Title	Operating Systems
Course Code	21CS44
Course outcomes (COs) : At the end of the course the student will be able to:	
C212.1	Identify the structure of an operating system and its scheduling mechanism.

C212.2	Demonstrate the allocation of resources for a process using scheduling algorithm.
C212.3	Identify root causes of deadlock and provide the solution for deadlock elimination.
C212.4	Explore about the storage structures and learn about the Linux Operating system.
C212.5	Analyze Storage Structures and Implement Customized Case study.

Course Title	Python Programming Laboratory
Course Code	21CSL46
Course outcomes (COs) : At the end of the course the student will be able to:	
C214.1	Demonstrate proficiency in handling of loops and creation of functions.
C214.2	Identify the methods to create and manipulate lists, tuples and dictionaries.
C214.3	Discover the commonly used operations involving regular expressions and file system.
C214.4	Interpret the concepts of Object-Oriented Programming as used in Python.

Course Title	Web Programming
Course Code	21CSL481
Course outcomes (COs) : At the end of the course the student will be able to:	
C216.1	Describe the fundamentals of web and concept of HTML.
C216.2	Use the concepts of HTML, XHTML to construct the web pages.
C216.3	Interpret CSS for dynamic documents.
C216.4	Evaluate different concepts of JavaScript & Construct dynamic documents.

Course Title	Mathematical Foundation for Computing, Probability & Statistics
Course Code	21MATCS41
Course outcomes (COs) : At the end of the course the student will be able to:	
C.209.1	Apply the concepts of logic for effective computation and relating problems in the Engineering domain.
C.209.2	Analyze the concepts of functions and relations to various fields of Engineering. Comprehend the concepts of Graph Theory for various applications of Computational sciences.
C.209.3	Apply the discrete and continuous probability distributions to solve the probability models arising in engineering field.
C.209.4	Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data.
C.209.5	Construct joint probability distributions and demonstrate the validity of testing the hypothesis.

Course Title	Management and Entrepreneurship for It Industry
Course Code	18CS51
Course outcomes (COs) : At the end of the course the student will be able to:	
C301.1	Understand the meaning, scope, development of management thoughts and to analyze the objectives of planning process, types of organization and staffing.
C301.2	Understand the meaning of directing, Leadership styles, motivation theories, communication and to establish controlling methods.
C301.3	Understand the meaning and function of Entrepreneur, the role of Entrepreneur in the

	economic development and to identify business opportunities along with feasibility studies.
C301.4	Understand the procedure to prepare project report and to study Enterprise Resource Planning.
C301.5	Understand the Micro and small enterprise and to Infer the importance of intellectual properties rights and relate the institutional support.

Course Title	Computer Networks and Security
Course Code	18CS52
Course outcomes (COs) : At the end of the course the student will be able to:	
C302.1	Understand the concepts of various application layer protocols
C302.2	Understand the transport layer services and compare UDP and TCP protocols
C302.3	Understand the various routing algorithms used in network layer
C302.4	Understanding the different network security algorithms and its applications
C302.5	Understand the various network support provided for multimedia data by considering the Quality of Service

Course Title	Database Management System
Course Code	18CS53
Course outcomes (COs) : At the end of the course the student will be able to:	
C303.1	Apply fundamentals of database concept and entity relationship model in database applications.
C303.2	Design a database using RDBMS and use this for database applications.
C303.3	Design and develop database and database in Internet Applications.
C303.4	Design database using normalization.
C303.5	Understanding the transaction processing and recovery methods in database.

Course Title	Automata Theory and Computability
Course Code	18CS54
Course outcomes (COs) : At the end of the course the student will be able to:	
C304.1	Apply the Knowledge of theory of computation to design DFSM, NFSM for a given problem
C304.2	Able to write Regular Expression and Regular Grammar for a given Language.
C304.3	Able to write Context free grammar and Design PDA for given problem.
C304.4	Apply the properties of CFL in Language processing and Designing OF Turing Machine models for the given Language.
C304.5	Understand the variants of Turing Machine and Classify the problems with respect to different model of computation.

Course Title	Application Development using Python
Course Code	18CS55
Course outcomes (COs) : At the end of the course the student will be able to:	
C305.1	Demonstrate proficiency in handling flow control statements and creation of functions in Python.
C305.2	Identify the methods to create and manipulate lists, tuples, strings and dictionaries in Python.

C305.3	Discover the commonly used operations involving regular expressions and file system in Python.
C305.4	Implement the basic Object Oriented Programming concepts in Python.
C305.5	Determine the need for scraping websites and working with CSV, JSON and other file formats in Python

Course Title	UNIX Programming
Course Code	18CS56
Course outcomes (COs) : At the end of the course the student will be able to:	
C306.1	Explain Unix Architecture, File system and use of Basic Commands
C306.2	Illustrate Shell Programming and to write Shell Scripts
C306.3	Categorize, compare and make use of Unix System Calls
C306.4	Build an application/service over a Unix system,
C306.5	Understand UNIX Process, IPC and Signals

Course Title	Computer Network Laboratory
Course Code	18CSL57
Course outcomes (COs) : At the end of the course the student will be able to:	
C307.1	Implement the network based messaging application and understand the impact of network parameters on performance
C307.2	Demonstrate the working of different concepts of networking
C307.3	Implement, analyze and evaluate networking protocols in NS2 / NS3
C307.4	Implement, analyze and evaluate wireless networking protocols in NS2 / NS3

Course Title	DBMS Laboratory with Mini Project
Course Code	18CSL58
Course outcomes (COs) : At the end of the course the student will be able to:	
C308.1	Understand the basic knowledge in database concepts, technology and to groom into well informed database application developers
C308.2	Strong practice in SQL programming through a variety of database problems.
C308.3	Able to demonstrate the working of different concepts of DBMS
C308.4	Implement, analyze and evaluate the project developed for an application
C308.1	Understand the basic knowledge in database concepts, technology and to groom into well informed database application developers

Course Title	System Software and Compilers
Course Code	18CS61
Course outcomes (COs) : At the end of the course the student will be able to:	
C310.1	Understanding the design of assemblers for a hypothetical machine SIC& SIC/XE and basic loader function
C310.2	Describe the lexical analysis and their importance
C310.3	Describe the role of parsers and different parsing techniques such as top down parsers, bottom up parsing
C310.4	Design and develop different system software using LEX and YACC tools

C310.5	Understanding the importance of syntax directed translation, various representation of intermediate codes and issues in code generation
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Course Title	Computer Graphics and Visualization
Course Code	18CS62
Course outcomes (COs) : At the end of the course the student will be able to:	
C311.1	Understand the basics of computer graphics and OpenGL
C311.2	Apply the concepts of geometric and viewing transformations on 2D objects
C311.3	Apply the concepts of clipping, 3D viewing and Illumination models
C311.4	Understand three-dimensional Viewing and Visible Surface Detection
C311.5	Determine various inputs to the graphics system and user interactions with it.

Course Title	Web Technology and its Application
Course Code	18CS63
Course outcomes (COs) : At the end of the course the student will be able to:	
C312.1	Design the web page using HTML and CSS
C312.2	Construct and visually format tables and create forms using HTML and CSS
C312.3	Write Client-Side Scripts using JavaScript and Server-Side Scripts using PHP to design a web page
C312.4	Develop Server-side scripts using the principles of object oriented concepts using PHP
C312.5	Design a simple website using various web technologies

Course Title	Data Mining and Data Warehousing
Course Code	18CS641
Course outcomes (COs) : At the end of the course the student will be able to:	
C312A.1	Understanding the basics of data warehousing and its modeling approach for data warehouse
C312A.2	Understanding the implementation of data warehouse and principals of Data mining
C312A.3	Understanding the various association rule mining algorithm and evaluation of pattern
C312A.4	Apply various classification algorithms for different data set.
C312A.5	Apply various clustering algorithms for different data set.

Course Title	Cloud Computing and its Application
Course Code	18CS645
Course outcomes (COs) : At the end of the course the student will be able to:	
C313A.1	Explain cloud computing, virtualization technology and its taxonomy.
C313A.2	Illustrate architecture, classification of services and cloud models and Aneka cloud platform.
C313A.3	Illustrate programming in cloud and high throughput computing.
C313A.4	Describe the data intensive computing and Mapreduce model.
C313A.5	Describe platforms for development of cloud applications and List the application of cloud.

Course Title	Introduction to Data Structures and Algorithms
Course Code	18CS652
Course outcomes (COs) : At the end of the course the student will be able to:	
C314A.1	Understand the logic, develop the algorithm and write the flow chart and pseudo-code for the given problem
C314A.2	Understand the concept of arrays, structures and pointers to organize and access data and apply static and dynamic methods for allocating memory to store data
C314A.3	Implement stacks and queues using static and dynamic arrays.
C314A.4	Implement and traverse Queues and Trees
C314A.5	Understand the concept of Graphs and implement different Sorting techniques on arrays

Course Title	Programming in Java
Course Code	18CS653
Course outcomes (COs) : At the end of the course the student will be able to:	
C314B.1	Describe object-oriented programming and different Data types, Variables, and Arrays in Java programming
C314B.2	Develop simple Java programs using operators and control statements
C314B.3	Introduce the concepts of Classes and Inheritance in Java programs to solve real world problems.
C314B.4	Demonstrate the creation and use of packages, and the concept of exception handling in Java
C314B.5	Demonstrate the concept of I/O, Enumeration, type wrapper, Applet and string handling in Java

Course Title	System Software and Operating System Laboratory
Course Code	18CSL66
Course outcomes (COs) : At the end of the course the student will be able to:	
C315.1	Implement and demonstrate LEX Tool.
C315.2	Implement and demonstrate YACC Tool.
C315.3	Analyse and evaluate different algorithms for CPU scheduling.
C315.4	Evaluate different algorithms required for Memory management, allocation and communication used in operating system.

Course Title	Computer Graphics Laboratory with Mini Project
Course Code	18CSL67
Course outcomes (COs) : At the end of the course the student will be able to:	
C316.1	Apply line drawing, line clipping algorithm.
C316.2	Design and apply two Dimensional and three dimensional graphics and transformation
C316.3	Apply lighting and shading techniques in computer graphics
C316.4	Create interactive graphics applications using OpenGL

Course Title	Mobile Application Development
Course Code	18CSMP68

Course outcomes (COs) : At the end of the course the student will be able to:	
C317.1	Create, test and debug Android application by setting up Android development environment.
C317.2	Implement adaptive, responsive user interfaces that work across a wide range of devices.
C317.3	Infer long running tasks and background work in Android applications.
C317.4	Demonstrate methods in storing, sharing and retrieving data in Android applications.
C317.5	Infer the role of permissions and security for Android applications

Course Title	Artificial Intelligence and Machine Learning
Course Code	18CS71
Course outcomes (COs) : At the end of the course the student will be able to:	
C401.1	Understand AI concepts and solve AI problems by applying suitable heuristic search techniques
C401.2	Describe knowledge representation issues & rules and explain various concept learning algorithms
C401.3	Implement appropriate learning algorithm such as Decision Tree and ANN for various AI problems
C401.4	Design Bayesian networks and use machine learning for prediction
C401.5	Understand and apply instance based learning & reinforcement learning techniques

Course Title	Big Data Analytics
Course Code	18CS72
Course outcomes (COs) : At the end of the course the student will be able to:	
C402.1	Understand fundamentals of Big Data analytics.
C402.2	Investigate and understand the Hadoop framework and Hadoop Distributed File system.
C402.3	Understand the concepts of NoSQL using MongoDB and Cassandra for Big Data.
C402.4	Understand & Demonstrate the MapReduce programming model to process the big data along with Hadoop tools.
C402.5	Understand the various machine learning algorithms for Big data analytics, web mining and Social Network Analysis.

Course Title	User Interface Design
Course Code	18CS73
Course outcomes (COs) : At the end of the course the student will be able to:	
C403.1	Understand the importance and principles of user Interfaces
C403.2	Understand user interface design process and business functions
C403.3	Design structures of menus creation, navigation schemes and connection between menus and windows
C403.4	Understand the characteristics and components of windows, its operations and various device based controls of the window
C403.5	Understand various screen based controls, various tests- prototypes and types of tests.

Course Title	Robotic Process Automation Design & Development
Course Code	18CS745
Course outcomes (COs) : At the end of the course the student will be able to:	
C404A.1	Able To Understand the basic concepts of RPA
C404A.2	Able To Describe various components and platforms of RPA
C404A.3	Able to Understand the different types of variables, control flow and data manipulation techniques
C404A.4	Able To understand various control techniques and OCR in RPA
C404A.5	Able To Describe various types and strategies to handle exceptions

Course Title	Python Application Programming
Course Code	18CS752
Course outcomes (COs) : At the end of the course the student will be able to:	
C405A.1	Examine Python syntax and semantics and be fluent in the use of Python flow control and functions.
C405A.2	Demonstrate proficiency in handling Strings and File Systems.
C405A.3	Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions.
C405A.4	Interpret the concepts of Object-Oriented Programming as used in Python.
C405A.5	Implement exemplary applications related to Network Programming, Web Services and Databases in Python.

Course Title	Artificial Intelligence and Machine Learning Laboratory
Course Code	18CSL76
Course outcomes (COs) : At the end of the course the student will be able to:	
C406.1	Implement and evaluate AI search algorithms in Python programming language.
C406.2	Implement and evaluate concept learning and decision tree algorithms in Python programming language.
C406.3	Build Artificial Neural Network and Bayesian Networks by implementing back-propagation algorithm and Naïve Bayesian classifier in Python programming language.
C406.4	Implement and evaluate instance based learning algorithms in Python programming language.

Course Title	Internet of Things
Course Code	18CS81
Course outcomes (COs) : At the end of the course the student will be able to:	
C407.1	Assess the genesis and impact of IoT and impact of IoT applications, architectures in real world
C407.2	Illustrate various methods of deploying smart objects and connect them to network
C407.3	Understand the IoT network layer, transport layer and application layer
C407.4	Infer the role of Data Analytics and Security in IoT.
C407.5	Identify sensor technologies for sensing real world entities and understand the role of IoT in various domains of Industry

Course Title	Storage Area Networks
Course Code	18CS822
Course outcomes (COs) : At the end of the course the student will be able to:	
C408.1	Understand the key components of data center environments, compare and select the appropriate RAID techniques for a given application and building an intelligence storage system
C408.2	Understand the various storage networking technologies - SAN, NAS, CAS and their implementation
C408.3	Identify the need for backup, archive and replication technologies for business continuity and their various implementation techniques
C408.4	Understand the various characteristics and services of cloud computing and benefits of virtualization
C408.5	Understand the need of security framework for storage infrastructure and various approaches for monitoring storage infrastructure

Course Outcomes (COs) of Department of CSE (IoT & Cyber Security with Blockchain Technology)

Course Title	Transform Calculus, Fourier Series and Numerical Techniques
Course Code	21MAT31
Course outcomes (COs) : At the end of the course the student will be able to:	
C201.1	To solve ordinary differential equations using Laplace transform.
C201.2	Demonstrate Fourier series to study the behaviour of periodic functions and their applications in system communications, digital signal processing and field theory
C201.3	To use Fourier transforms to analyze problems involving continuous-time signals and to apply Z- Transform techniques to solve difference equations
C201.4	To solve mathematical models represented by initial or boundary value problems involving partial differential equations
C201.5	Determine the extremals of functionals using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis.

Course Title	Data Structures and Applications
Course Code	21CS32
Course outcomes (COs) : At the end of the course the student will be able to:	
C202.1	Identify different data structures and their applications.
C202.2	Apply stack and queues in solving problems.
C202.3	Demonstrate applications of linked list.
C202.4	Explore the applications of trees and graphs to model and solve the real-world problem.
C202.5	Make use of Hashing techniques and resolve collisions during mapping of key value pairs

Course Title	Analog and Digital Electronics
Course Code	21CS33
Course outcomes (COs) : At the end of the course the student will be able to:	
C203.1	Design and analyze application of analog circuits using photo devices, timer IC, power supply and regulator IC and op-amp.
C203.2	Explain the basic principles of A/D and D/A conversion circuits and develop the same.
C203.3	Simplify digital circuits using Karnaugh Map, and Quine-McClusky Methods
C203.4	Explain Gates and flip flops and make us in designing different data processing circuits, registers and counters and compare the types
C203.5	Develop simple HDL programs

Course Title	Computer Organization and Architecture
Course Code	21CS34
Course outcomes (COs) : At the end of the course the student will be able to:	
C204.1	Explain the organization and architecture of computer systems with machine instructions and programs

C204.2	Analyze the input/output devices communicating with computer system
C204.3	Demonstrate the functions of different types of memory devices
C204.4	Apply different data types on simple arithmetic and logical unit
C204.5	Analyze the functions of basic processing unit, Parallel processing and pipelining

Course Title	Object Oriented Programming with Java Laboratory
Course Code	21CSL35
Course outcomes (COs) : At the end of the course the student will be able to:	
C205.1	Use Eclipse/NetBeans IDE to design, develop, debug Java Projects. and become familiar with the fundamental concepts in OOP.
C205.2	Analyze the necessity for Object Oriented Programming paradigm over structured programming
C205.3	Demonstrate the ability to design and develop java programs, analyze, and interpret object-oriented data and document results.
C205.4	Apply the concepts of multiprogramming, exception/event handling, and abstraction to develop robust programs.
C205.5	Develop user friendly applications using File I/O and GUI concepts

Course Title	Mastering Office
Course Code	21CSL381
Course outcomes (COs) : At the end of the course the student will be able to:	
C206.1	Know the basics of computers and prepare documents, spreadsheets, make small presentations with audio, video and graphs and would be acquainted with internet.
C206.2	CO 2. Create, edit, save and print documents with list tables, header, footer, graphic, spellchecker, mail merge and grammar checker
C206.3	Attain the knowledge about spreadsheet with formula, macros spell checker etc.
C206.4	Demonstrate the ability to apply application software in an office environment.
C206.5	Use Google Suite for office data management tasks

Course Title	Mathematical Foundations for Computing
Course Code	21CS41
Course outcomes (COs) : At the end of the course the student will be able to:	
C207.1	Apply the concepts of logic for effective computation and relating problems in the Engineering domain.
C207.2	Analyze the concepts of functions and relations to various fields of Engineering. Comprehend the concepts of Graph Theory for various applications of Computational sciences.
C207.3	Apply discrete and continuous probability distributions in analysing the probability models arising in the engineering field.
C207.4	Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data.
C207.5	Construct joint probability distributions and demonstrate the validity of testing the hypothesis.

Course Title	Mathematical Foundation for Computing, Probability & Statistics
Course Code	21MATCS41
Course outcomes (COs) : At the end of the course the student will be able to:	
C.207.1	Apply the concepts of logic for effective computation and relating problems in the Engineering domain.
C.207.2	Analyze the concepts of functions and relations to various fields of Engineering. Comprehend the concepts of Graph Theory for various applications of Computational sciences.
C.207.3	Apply the discrete and continuous probability distributions to solve the probability models arising in engineering field.
C.207.4	Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data.
C.207.5	Construct joint probability distributions and demonstrate the validity of testing the hypothesis.

Course Title	Design and Analysis of Algorithms
Course Code	21CS42
Course outcomes (COs) : At the end of the course the student will be able to:	
C208.1	Analyze the performance of the algorithms, state the efficiency using asymptotic notations and analyze mathematically the complexity of the algorithm.
C208.2	Apply divide and conquer approaches and decrease and conquer approaches in solving the problems analyze the same
C208.3	Apply the appropriate algorithmic design technique like greedy method, transform and conquer approaches and compare the efficiency of algorithms to solve the given problem.
C208.4	Apply and analyze dynamic programming approaches to solve some problems. and improve an algorithm time efficiency by sacrificing space.
C208.5	Apply and analyze backtracking, branch and bound methods and to describe P, NP and NP Complete problems.

Course Title	Microcontroller and Embedded Systems
Course Code	21CS43
Course outcomes (COs) : At the end of the course the student will be able to:	
C209.1	Explain C-Compilers and optimization
C209.2	Describe the ARM microcontroller's architectural features and program module.
C209.3	Apply the knowledge gained from programming on ARM to different applications.
C209.4	Program the basic hardware components and their application selection method.
C209.5	Demonstrate the need for a real-time operating system for embedded system applications.

Course Title	Operating Systems
Course Code	21CS44
Course outcomes (COs) : At the end of the course the student will be able to:	
C210.1	Identify the structure of an operating system and its scheduling mechanism.

C210.2	Demonstrate the allocation of resources for a process using scheduling algorithm.
C210.3	Identify root causes of deadlock and provide the solution for deadlock elimination
C210.4	Explore about the storage structures and learn about the Linux Operating system.
C210.5	Analyze Storage Structures and Implement Customized Case study

Course Title	Python Programming Laboratory
Course Code	21CSL46
Course outcomes (COs) : At the end of the course the student will be able to:	
C211.1	Demonstrate proficiency in handling of loops and creation of functions
C211.2	Identify the methods to create and manipulate lists, tuples and dictionaries.
C211.3	Discover the commonly used operations involving regular expressions and file system.
C211.4	Interpret the concepts of Object-Oriented Programming as used in Python.
C211.5	Determine the need for scraping websites and working with PDF, JSON and other file formats.

Course Title	Web Programming
Course Code	21CSL481
Course outcomes (COs) : At the end of the course the student will be able to:	
C212.1	Describe the fundamentals of web and concept of HTML.
C212.2	Use the concepts of HTML, XHTML to construct the web pages.
C212.3	Interpret CSS for dynamic documents.
C212.4	Evaluate different concepts of JavaScript & Construct dynamic documents.
C212.5	Design a small project with JavaScript and XHTML.

Course Outcomes (COs) of Department of Electronics & Communication Engineering

Course Title	Transform calculus, Fourier series, and Numerical Techniques
Course Code	21MAT31
Course outcomes (COs) : At the end of the course the student will be able to:	
C201.1	Solve ordinary differential equations using Laplace transform.
C201.2	Demonstrate the Fourier series to study the behavior of periodic functions and their applications in system communications, digital signal processing, and field theory.
C201.3	Make use of Fourier transforms to analyze problems involving continuous-time signals and to apply Z-transform techniques to solve difference equations.
C201.4	Solve mathematical models represented by initial or boundary value problems involving partial differential equations
C201.5	Determine the extremals of functionals using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis.

Course Title	System Design Using Verilog
Course Code	21EC32
Course outcomes (COs) : At the end of the course the student will be able to:	
C202.1	Develop simplified switching equations using Karnaugh Maps and Quine McClusky techniques.
C202.2	Analyze and design of Combinational Circuits by understanding the operation of decoders, encoders, multiplexers, adders, subtractors, and comparators.
C202.3	Analyze the concepts of Flip Flops (SR, D, T, and JK) and to design the synchronous sequential circuits.
C202.4	Understand Verilog constructs and design combinational and sequential circuits using data flow description.
C202.5	Design and model digital circuits using behavioral, structural descriptions.

Course Title	Basic Signal Processing
Course Code	21EC33
Course outcomes (COs) : At the end of the course the student will be able to:	
C203.1	Understand the concept of vector spaces, linear independence, basis, dimension and orthogonality.
C203.2	Evaluate the Eigen values and Eigen vectors of a given matrix.
C203.3	Classify the signals and systems based on their properties and perform the operations on signals.
C203.4	Represent the Linear Time-Invariant (LTI) systems using impulse response and verify their properties.
C203.5	Compute Z-transforms, inverse Z- Z-transforms and analyze the transfer functions of LTI systems in Z-domain.

Course Title	Analog Electronic Circuits
Course Code	21EC34
Course outcomes (COs) : At the end of the course the student will be able to:	
C204.1	Understand the characteristics of BJTs and FETs for switching and amplifier

	circuits.
C204.2	Design and analyze FET amplifiers and oscillators with different circuit configurations and biasing conditions.
C204.3	Understand the feedback topologies and approximations in the design of amplifiers and oscillators.
C204.4	Design of circuits using linear ICs for wide range applications such as ADC, DAC, filters and timers.
C204.5	Understand the power electronic device components and its functions for basic power electronic circuits.

Course Title	Analog & Digital Electronics Lab
Course Code	21ECL35
Course outcomes (COs) : At the end of the course the student will be able to:	
C205.1	Design and Analyze Amplifier, Oscillators using bipolar transistor and to demonstrate experiments using SCR and 555 Timer.
C205.2	Design and test Op amp circuits to realize the mathematical computations, DAC and precision rectifiers.
C205.3	Design and test the combinational logic circuits for the given specifications and sequential logic circuits for the given functionality.

Course Title	LIC Lab Using Pspice/MultiSIM
Course Code	21EC383
Course outcomes (COs) : At the end of the course the student will be able to:	
C208.1	Simulate and realize the circuits using op-amps for various applications like Schmitt Trigger, Precision Rectifier, instrumentation amplifier and Zero crossing detector.
C208.2	Simulate & design active filter (low pas and high pass) circuits for the given specifications and analyse digital to analog converters using op-amp.
C208.3	Simulate and analyse RC Phase shift oscillators using op-amp, multivibrator circuits using 555Timer.

Course Title	Complex Analysis, Probability and Statistical Methods
Course Code	21MAT41
Course outcomes (COs) : At the end of the course the student will be able to:	
C209.1	Use the concepts of an analytic function and complex potentials to solve the problems arising in electromagnetic field theory. Apply the concept of line integral to solve the problems on Cauchy theorem and Cauchy integrals.
C209.2	Understand the series solution of Bessel's and Legendre's differential equations and solve Legendre's polynomial equations.
C209.3	Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data.
C209.4	Apply discrete and continuous probability distributions to solve the probability models arising in the engineering field.
C209.5	Construct joint probability distributions occurring in digital signal processing. Demonstrate the validity of testing the hypothesis.

Course Title	Digital Signal Processing
Course Code	21EC42
Course outcomes (COs) : At the end of the course the student will be able to:	
C210.1	Compute Discrete Fourier Transform (DFT)/Inverse DFT of discrete sequence using the definition and properties of DFT.
C210.2	Evaluate the DFT using linear filtering approach and develop Fast Fourier Transform (FFT) algorithms to reduce the computation time of DFT.
C210.3	Design Finite Impulse Response (FIR) filters using windowing technique and to realize FIR filters using Direct, Cascade form and Lattice structures.
C210.4	Design Infinite Impulse Response (IIR) filters using Butterworth approximation and to realize IIR filters using Direct form I, II structures.
C210.5	Implement FIR and IIR filters in fixed point Digital Signal Processor.

Course Title	Circuits & Controls
Course Code	21EC43
Course outcomes (COs) : At the end of the course the student will be able to:	
C211.1	Analyse & Solve Electric Circuits, by applying, Loop Analysis, Nodal Analysis, and by applying Network Theorems.
C211.2	Evaluate Two Port parameters of a network and apply Laplace transforms to solve electric networks.
C211.3	Deduce the transfer function of a given physical system, from differential equation representation or block diagram representation and SFG representation.
C211.4	Determine time response specifications and analyse the stability of the system.
C211.5	Perform frequency response analysis to find the stability of the system and find the time response of the system by representing the State Model

Course Title	Communication Theory
Course Code	21EC44
Course outcomes (COs) : At the end of the course the student will be able to:	
C212.1	Describe the principle of generation, detection of AM, SSB, VSB modulation.
C212.2	Describe the principle of generation, detection, and applications of angle modulation.
C212.3	Characterize the influence of channel noise on analog modulated signals.
C212.4	Represent analog signal in digital format and describe the characteristics of pulse amplitude modulation and pulse position modulation techniques.
C212.5	Analyze the concepts of digitization of signals like sampling, quantizing, and encoding. Illustrate digital formatting representation used for multiplexers, vocoders, and video transmission.

Course Title	Communication Laboratory -I
Course Code	21ECL46
Course outcomes (COs) : At the end of the course the student will be able to:	
C214.1	Demonstrate the electronic circuits for filters, mixer using BJT/FET & analog modulation schemes by representing its waveforms.
C214.2	Design and test the sampling, Multiplexing, and PAM with relevant circuits and

	illustrate the operation of PCM and delta modulations for different input conditions.
C214.3	Simulate the analog and digital modulation schemes using MATLAB/SCILAB.

Course Title	Embedded C Basics
Course Code	21EC481
Course outcomes (COs) : At the end of the course the student will be able to:	
C216.1	Develop C Program in 8051 for solving simple problems that manipulate input data using different instructions of 8051 C.
C216.2	Develop testing and experimental procedures on 8051 Microcontroller, analyze their operation under different cases with real-world problems.

Course Title	Technological Innovation Management and Entrepreneurship
Course Code	18ES51
Course outcomes (COs) : At the end of the course the student will be able to:	
C301.1	Understand functions of management involving planning and decision making process
C301.2	Understand and apply the Management Concepts of organizing, Staffing, Directing and controlling
C301.3	Describe the importance, characteristics of entrepreneurs and their social responsibilities
C301.4	Understand the Role and Importance of Family Business, Ideation Process, Feasibility Study and identify the sources of funding
C301.5	Apply the concepts of Business plans and network analysis

Course Title	Digital Signal Processing
Course Code	18EC52
Course outcomes (COs) : At the end of the course the student will be able to:	
C302.1	Compute Discrete Fourier Transform (DFT)/Inverse DFT of discrete sequence using the definition and properties of DFT along with its real and complex discrete time signals.
C302.2	Evaluate the DFT using linear filtering approach and develop Fast Fourier Transform (FFT) algorithms to reduce the computation time of DFT.
C302.3	Design Finite Impulse Response (FIR) filters using Rectangular, Hamming, Hanning and Bartlett windows and realize FIR filters using Direct form, Linear phase, Frequency sampling and Lattice structures.
C302.4	Design and analyze analog/digital Infinite Impulse Response (IIR) filters using Butterworth and to realize IIR filters using Direct form I, II structures.
C302.5	Understand basics of digital signal processors such as processor architectures and hardware units, investigates fixed-point and floating-point formats and illustrates the implementation of digital filters.

Course Title	Principles of Communication Systems
Course Code	18EC53
Course outcomes (COs) : At the end of the course the student will be able to:	

C303.1	Describe principle generation, detection of AM, SSB, VSB modulation.
C303.2	Describe principle generation, detection and applications of angle modulation.
C303.3	Illustrate random process of analog signal in time domain and types of noise in channel and analyze the performance of communication system in presence of noise.
C303.4	Represent analog signal in digital format using sampling and quantization
C303.5	Describe different digital modulation techniques such as PCM, Delta modulation, MPEG and Vocoders.

Course Title	Information Theory and Coding
Course Code	18EC54
Course outcomes (COs) : At the end of the course the student will be able to:	
C304.1	Calculate entropy, efficiency of dependent and independent sources.
C304.2	Analyze the performance of Shannon encoding algorithm, Shannon fano encoding algorithm, Huffman coding.
C304.3	Measure mutual information, channel capacity based on channel parameters.
C304.4	Design encoding, decoding procedure and detect correct errors of linear block codes, cyclic codes.
C304.5	Design encoding, decoding procedure for convolutional code and analyze error.

Course Title	Electromagnetic Waves
Course Code	18EC55
Course outcomes (COs) : At the end of the course the student will be able to:	
C305.1	Evaluate problems on electrostatic force, electric field due to point, linear, volume charges by applying conventional methods and charge in a volume.
C305.2	Apply Gauss law to evaluate Electric fields due to different charge distributions and Volume Charge distribution by using Divergence Theorem and determine potential and energy of a point charge.
C305.3	Determine capacitance of a parallel plate capacitor, coaxial cylindrical capacitor with different charge distributions using Laplace equation and Apply Biot-Savart's and Ampere's laws for evaluating Magnetic field for different current configurations
C305.4	Calculate magnetic force, potential energy and Magnetization with respect to magnetic materials and voltage induced in electric circuits.
C305.5	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.

Course Title	Verilog Hardware Description Language
Course Code	18EC56
Course outcomes (COs) : At the end of the course the student will be able to:	
C306.1	Distinguish digital design methodologies, module and module instances. Analyze & apply simulation components to digital design.
C306.2	Design Verilog module with system task and compiler directives
C306.3	Design digital circuit using gate-level and data flow modeling.
C306.4	Design digital circuit using behavioral modeling and to understand Verilog tasks,

	functions.
C306.5	Interpret the various constructs in logic synthesis and to perform timing and delay simulation.

Course Title	Digital Signal Processing Lab
Course Code	18ECL57
Course outcomes (COs) : At the end of the course the student will be able to:	
C307.1	Determine the sampling frequency required for a multispectral signal and to solve given difference equation.
C307.2	Perform convolution, correlation of two given sequences. Further, verify the properties of the convolution and correlation
C307.3	Obtain the transform domain representation of a sequence using the DFT. Plot the magnitude and phase spectrum. Apply the DFT properties to obtain the transformed domain representation in an efficient way.
C307.4	Design the FIR and IIR filter for the given specifications

Course Title	Hardware Description Language Lab
Course Code	18ECL58
Course outcomes (COs) : At the end of the course the student will be able to:	
C308.1	Write the Verilog programs to simulate Combinational Circuits in Dataflow, Behavioral and Gate Level Abstractions
C308.2	Describe sequential circuits like flip flops and counters in Behavioral description and obtain simulation waveforms.
C308.3	Synthesize Combinational and Sequential circuits on Programmable IC's and test the functionality on hardware.
C308.4	Interface the hardware to the programmable chips and obtain the required output.

Course Title	Digital Communication
Course Code	18EC61
Course outcomes (COs) : At the end of the course the student will be able to:	
C310.1	Associate and apply the concepts of Band pass sampling to well specified signals and channels.
C310.2	Compute performance parameters of system for low pass and band pass signals under ideal, corrupted and non-band limited conditions.
C310.3	Test and validate symbol processing and performance parameters at the receiver under ideal and non-ideal band limited channels.
C310.4	Analyse and demonstrate by simulation and emulation the transmission and reconstruction of band pass signals subjected to errors in a band limited channel.
C310.5	Understand the principle of spread spectrum communication techniques and evaluate the performance parameters.

Course Title	Embedded Systems
Course Code	18EC62
Course outcomes (COs) : At the end of the course the student will be able to:	

C311.1	Describe the architectural features of ARM Cortex M3, a 32-bit microcontroller including memory map, interrupts and exceptions.
C311.2	Write C and assembly language program for ARM cortex M3 using Bit-band operations, memory mapping
C311.3	Understand the basic hardware components in an embedded system and their application areas.
C311.4	Describe the hardware software co-design and firmware design approaches
C311.5	Explain the need of real time operating system for embedded system applications.

Course Title	Microwave and Antennas
Course Code	18EC63
Course outcomes (COs) : At the end of the course the student will be able to:	
C312.1	Describe the use and advantages of microwave generation and transmission using reflex klystron and Analyze the parameters related to microwave transmission lines and waveguides
C312.2	Analyze S matrix representation for Multi-Port Networks and Identify microwave devices for several applications.
C312.3	Understand strip lines in coplanar transmission lines and apply the basic parameters of antenna to determine directivity of radiation patterns in terms of beam width.
C312.4	Analyze isotropic point sources in an array system and design an array antenna for N isotropic sources. Derive the expression for radiation patterns of various antennae
C312.5	Distinguish the antennas (Wire, Aperture and Array Antennas) according to the applications.

Course Title	Python Application Programming
Course Code	18EC646
Course outcomes (COs) : At the end of the course the student will be able to:	
C313A.1	Understand Python syntax and semantics and be fluent in the use of Python flow control and functions.
C313A.2	Demonstrate Strings and File Systems in Python.
C313A.3	Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions.
C313A.4	Interpret the concepts of Object-Oriented Programming as used in Python.
C313A.5	Implement exemplary applications related to Network Programming and Web Services in Python.

Course Title	Sensors & Signal Conditioning
Course Code	18EC652
Course outcomes (COs) : At the end of the course the student will be able to:	
C314A.1	Use concepts in common methods for converting a physical parameter into an electrical quantity.
C314A.2	Designing of Signal conditioning Instrument which enhances the sensor signal for Signal processing function.
C314A.3	Understand about the material properties required to make sensors.
C314A.4	Use of sensors to specific end use application and to Predict the expected

	performance of various sensors.
C314A.5	Understand different type of semiconductor sensors used in real life applications and paraphrase their importance.

Course Title	Microcontrollers
Course Code	18EC654
Course outcomes (COs) : At the end of the course the student will be able to:	
C314B.1	Describe the architectural features of 8051 Microcontroller and Memory organisation and its basics.
C314B.2	Analyse the 8051 Addressing Modes and to write the assembly level programs
C314B.3	Understand the 8051 Instruction set and to write assembly programs
C314B.4	Understand 8051 Microcontroller interfacing and interface various peripheral devices
C314B.5	Analyze Interrupts and Timer/Counter operation of 8051 and write assembly and C program for Serial communication

Course Title	Embedded Systems Lab
Course Code	18ECL66
Course outcomes (COs) : At the end of the course the student will be able to:	
C315.1	Understand the instruction set of 32-bit ARM Cortex M3 and the Keil IDE for programming in Assembly and Embedded C language.
C315.2	Develop Embedded C program to display message on LCD using UART & generate PWM, interface DAC.
C315.3	Develop Embedded C program to interface Cortex M3 to LED's, 7 segment display & to control DC, Stepper Motor.
C315.4	Develop Embedded C programs to interface temperature sensors (LM35) using SPI ADC, Hex keypad.

Course Title	Communication Lab
Course Code	18ECL67
Course outcomes (COs) : At the end of the course the student will be able to:	
C316.1	Design and test the analog and digital modulation circuits and display the waveforms.
C316.2	Understand the microwave signal measurement, the characteristics of different microwave devices and various antennas.
C316.3	Simulate the digital modulation systems and compare the error performance of basic digital modulation schemes.

Course Title	Mini-Project
Course Code	18ECMP68
Course outcomes (COs) : At the end of the course the student will be able to:	
C317.1	Apply the knowledge, identify and collect information to deduce a problem statement for Mini project through discussion.
C317.2	Identify the applicable tools to design and develop solution for the Proposed Problem.
C317.3	Effectively Document and present the work with professional ethics as an

	individual or working as a team.
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Course Title	Computer Networks
Course Code	18EC71
Course outcomes (COs) : At the end of the course the student will be able to:	
C401.1	Understand the layering architecture of OSI reference model and TCP/ IP protocol suite.
C401.2	Understand the operation and Services of Data Link Layer, identify the Media Access Control and architectural comparison of Wireless LAN.
C401.3	Comprehend the Network Layer Addressing, Protocols and Apply the Unicast Routing Protocols.
C401.4	Recognize transport layer services in a computer communication network.
C401.5	Understand Application Layer functions and Protocol.

Course Title	VLSI Design
Course Code	18EC72
Course outcomes (COs) : At the end of the course the student will be able to:	
C402.1	Demonstrate understanding of MOS transistor theory, analyse ideal, non-ideal, transfer characteristics of CMOS inverter.
C402.2	Understand CMOS fabrication flow, technology scaling and draw the basic gates using stick & layout diagrams with knowledge of physical design aspects.
C402.3	Demonstrate the ability to design Combinational circuits.
C402.4	Demonstrate the ability to design Sequential & Dynamic logic circuits.
C402.5	Interpret memory elements along with timing considerations and Testability issues in VLSI Design.

Course Title	Satellite Communication
Course Code	18EC732
Course outcomes (COs) : At the end of the course the student will be able to:	
C403A.1	Describe the satellite orbits and its trajectories with the definitions of parameters associated with it.
C403A.2	Describe the electronic hardware systems associated with the satellite subsystem and earth station.
C403A.3	Compute the satellite link parameters under various propagation conditions with the illustration of multiple access techniques.
C403A.4	Describe the various applications of satellite with the focus on national satellite system.
C403A.5	Describe the non-communication applications of satellites.

Course Title	Cryptography
Course Code	18EC744
Course outcomes (COs) : At the end of the course the student will be able to:	
C404A.1	Understand the basics of cryptographic algorithms to encrypt and decrypt the data.
C404A.2	Apply the techniques of encrypting and decrypting for producing cipher by DES and AES private key encryption techniques.

C404A.3	Understand the basic concepts of number theory, modular arithmetic, finite fields, polynomial arithmetic, prime numbers, Fermat's, Euler's theorem and discrete logarithm.
C404A.4	Analyze the RSA, ECC public key cryptosystems and Diffie-hellman key management systems.
C404A.5	Illustrate the generation of Pseudorandom numbers using LCG and LFSR techniques for cryptographic applications.

Course Title	Digital Systems Design using VHDL
Course Code	18EC754
Course outcomes (COs) : At the end of the course the student will be able to:	
C405A.1	Design mealy and moore sequential network for the given sequence and to understand the basic concepts of digital design.
C405A.2	Develop VHDL Code for combinational and sequential digital circuits using different styles of modeling of VHDL.
C405A.3	Understand VHDL datatypes and develop VHDL code for simple digital design circuits using dataflow description
C405A.4	Design and verify the functionality of digital circuits (PLA, PAL, PLD) and Arithmetic Operations.
C405A.5	Identify the suitable Abstraction level for a particular digital design and testing Combinational Logic, Testing Sequential Logic

Course Title	Computer Networks Laboratory
Course Code	18ECL76
Course outcomes (COs) : At the end of the course the student will be able to:	
C406.1	Design and Simulate the Network, protocols for given specification.
C406.2	Demonstrate the working of given protocol and algorithm using C/C++ programming.

Course Title	VLSI Laboratory
Course Code	18ECL77
Course outcomes (COs) : At the end of the course the student will be able to:	
C407.1	Design, simulate basic CMOS circuits like inverter, common source amplifier and differential amplifier.
C407.2	Design layouts and perform physical verification of CMOS digital circuits.
C407.3	Design, simulate digital circuits using Verilog HDL and understand the synthesis process using the EDA tool.
C407.4	Evaluate the synthesis reports to obtain optimum gate level netlist by performing ASIC design flow.

Course Title	Project Work Phase-1
Course Code	18ECP78
Course outcomes (COs) : At the end of the course the student will be able to:	
C408.1	Apply the knowledge, identify and Collect information to deduce a problem

	definition for project through detailed review.
C408.2	Identify applicable tools to implement and exhibit the proposed project

Course Title	Wireless and Cellular Communication
Course Code	18EC81
Course outcomes (COs) : At the end of the course the student will be able to:	
C409.1	Understand the concept of cellular communication and factors effecting mobile radio propagation.
C409.2	Describe GSM system architecture and GSM system operations.
C409.3	Understand the basic CDMA system architecture and CDMA system operations.
C409.4	Understand the network architecture and to identify the multicarrier modulation.
C409.5	Describe the multiple access scheme and the LTE channel structure.

Course Title	Network Security
Course Code	18EC821
Course outcomes (COs) : At the end of the course the student will be able to:	
C410A.1	Understanding the concepts of Computer attacks and its security
C410A.2	Identify the threats in web and apply the counter measures available to enhance the security of web applications and apply
C410A.3	Illustrate the IP security policy and its modes, SA, AH, ESP, Combining security Associations Internet key exchange.
C410A.4	Understand the intruders and intrusion detection and Illustrate virus related threats
C410A.5	To identify the need for firewall and understand the characteristics, types and its configuration

Course Title	Project Work Phase-II
Course Code	18ECP83
Course outcomes (COs) : At the end of the course the student will be able to:	
C411.1	Design and develop sustainable solution for the betterment of society
C411.2	Develop a feasible system with scope for future enhancements and continuous lifelong learning
C411.3	Effectively present the work with professional ethics as an individual or working as a team.

Course Title	Technical Seminar
Course Code	18ECS84
Course outcomes (COs) : At the end of the course the student will be able to:	
C412.1	Identify and review research literature and comprehend solutions that exist to ECE problems.
C412.2	Understand the techniques, skills and use applicable tools necessary for presenting the authorized work.
C412.3	Communicate effectively on contemporary areas/trends/developments in Engineering fields and develop technical reports.
C412.4	Effectively present the work with professional ethics as an individual.

C412.5	Understand the impact of authorized work in societal and environmental context.
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Course Title	Internship
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Course Code	18ECI85
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Course outcomes (COs) : At the end of the course the student will be able to:

C413.1	Enhance the existing engineering knowledge and gain practical experience.
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C413.2	Understand through an intensive experience, the nature of workplaces and their associated values, routines and cultures.
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C413.3	Integrate and demonstrate existing and new technical knowledge for industrial application
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C413.4	Effectively present and write technical reports with professional ethics as an individual /Team on contemporary areas/trends/developments in Engineering fields.
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C413.5	Recognize the need for lifelong learning processes with Management skills through critical reflection of internship experiences.
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Course Outcomes (COs) of Department of Information Science & Engineering

Course Title	Data Structures and Applications
Course Code	21CS32
Course outcomes (COs) : At the end of the course the student will be able to:	
C202.1	Identify different data structures and their applications.
C202.2	Apply stack and queues in solving problems.
C202.3	Demonstrate applications of linked list.
C202.4	Explore the applications of trees and graphs to model and solve the real-world problem.
C202.5	Make use of Hashing techniques and resolve collisions during mapping of key value pairs

Course Title	Analog and Digital Electronics
Course Code	21CS33
Course outcomes (COs) : At the end of the course the student will be able to:	
C203.1	Design and analyze application of analog circuits using photo devices, timer IC, power supply and regulator IC and op-amp.
C203.2	Explain the basic principles of A/D and D/A conversion circuits and develop the same.
C203.3	Simplify digital circuits using Karnaugh Map, and Quine-McClusky Methods.
C203.4	Explain Gates and flip flops and make us in designing different data processing circuits, registers and counters and compare the types.
C203.5	Develop simple HDL programs

Course Title	Computer Organization and Architecture
Course Code	21CS34
Course outcomes (COs) : At the end of the course the student will be able to:	
C204.1	Explain the organization and architecture of computer systems with machine instructions and programs
C204.2	Analyze the input/output devices communicating with computer system.
C204.3	Demonstrate the functions of different types of memory devices.
C204.4	Apply different data types on simple arithmetic and logical unit.
C204.5	Analyze the functions of basic processing unit, Parallel processing and pipelining.

Course Title	Object Oriented Programming with Java Laboratory
Course Code	21CSL35
Course outcomes (COs) : At the end of the course the student will be able to:	
C205.1	Use Eclipse/NetBeans IDE to design, develop, debug Java Projects.
C205.2	Analyze the necessity for Object Oriented Programming paradigm over structured programming and become familiar with the fundamental concepts in OOP.
C205.3	Demonstrate the ability to design and develop java programs, analyze, and interpret object-oriented data and document results.
C205.4	Apply the concepts of multiprogramming, exception/event handling, abstraction to develop robust programs.

Course Title	Social Connect and Responsibility
Course Code	21SCR36
Course outcomes (COs) : At the end of the course the student will be able to:	
C206.1	Understand the need, and social responsibility in plantation, adoption of a tree.
C206.2	Develop connections with people around through their history and knowing the history, culture of the city.
C206.3	Practice sustainability and creativity by understanding the usefulness of organic farming and wet waste management.
C206.4	Apply sustainability by learning the methods of water conservation.
C206.5	Build planning and organizational skills by inculcating healthy food practices.

Course Title	Mastering Office
Course Code	21CSL381
Course outcomes (COs) : At the end of the course the student will be able to:	
C208.1	Know the basics of computers and prepare documents, spreadsheets, make small presentations with audio, video and graphs and would be acquainted with internet.
C208.2	Create, edit, save and print documents with list tables, header, footer, graphic, spellchecker, mail merge and grammar checker.
C208.3	Attain the knowledge about spreadsheet with formula, macros spell checker etc.
C208.4	Demonstrate the ability to apply application software in an office environment.

Course Title	Complex Analysis, Probability and Statistical Methods
Course Code	21MAT41
Course outcomes (COs) : At the end of the course the student will be able to:	
C209.1	Use the concepts of an analytic function and complex potentials to solve the problems arising in electromagnetic field theory. Apply the concept of line integral to solve the problems on Cauchy theorem and Cauchy integrals.
C209.2	Understand the series solution of Bessel's and Legendre's differential equations and solve Legendre's polynomial equations.
C209.3	Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data.
C209.4	Apply discrete and continuous probability distributions to solve the probability models arising in the engineering field.
C209.5	Construct joint probability distributions occurring in digital signal processing. Demonstrate the validity of testing the hypothesis.

Course Title	Design And Analysis of Algorithms
Course Code	21CS42
Course outcomes (COs) : At the end of the course the student will be able to:	
C210.1	Analyze the performance of the algorithms, state the efficiency using asymptotic notations and analyze mathematically the complexity of the algorithm.
C210.2	Apply divide and conquer approaches and decrease and conquer approaches in solving the problems analyze the same.
C210.3	Apply the appropriate algorithmic design technique like greedy method, transform and conquer approaches and compare the efficiency of algorithms to solve the

	given problem.
C210.4	Apply and analyze dynamic programming approaches to solve some problems. and improve an algorithm time efficiency by sacrificing space.
C210.5	Apply and analyze backtracking, branch and bound methods and to describe P, NP and NP-Complete problems.

Course Title	Microcontroller and Embedded Systems
Course Code	21CS43
Course outcomes (COs) : At the end of the course the student will be able to:	
C211.1	Explain C-Compilers and optimization.
C211.2	Describe the ARM microcontroller's architectural features and program module.
C211.3	Apply the knowledge gained from programming on ARM to different applications.
C211.4	Program the basic hardware components and their application selection method.
C211.5	Demonstrate the need for a real-time operating system for embedded system applications.

Course Title	Operating Systems
Course Code	21CS44
Course outcomes (COs) : At the end of the course the student will be able to:	
C212.1	Identify the structure of an operating system and its scheduling mechanism.
C212.2	Demonstrate the allocation of resources for a process using scheduling algorithm.
C212.3	Identify root causes of deadlock and provide the solution for deadlock elimination.
C212.4	Explore about the storage structures and learn about the Linux Operating system.
C212.5	Analyze Storage Structures and Implement Customized Case study.

Course Title	Python Programming Laboratory
Course Code	21CSL46
Course outcomes (COs) : At the end of the course the student will be able to:	
C214.1	Demonstrate proficiency in handling of loops and creation of functions.
C214.2	Identify the methods to create and manipulate lists, tuples and dictionaries.
C214.3	Discover the commonly used operations involving regular expressions and file system.
C214.4	Interpret the concepts of Object-Oriented Programming as used in Python.

Course Title	Web Programming
Course Code	21CSL481
Course outcomes (COs) : At the end of the course the student will be able to:	
C216.1	Describe the fundamentals of web and concept of HTML.
C216.2	Use the concepts of HTML, XHTML to construct the web pages.
C216.3	Interpret CSS for dynamic documents.
C216.4	Evaluate different concepts of JavaScript & Construct dynamic documents.

Course Title	Management and Entrepreneurship for IT Industry
Course Code	18CS51
Course outcomes (COs) : At the end of the course the student will be able to:	
C301.1	Understand the meaning, scope, development of management thoughts and to

	analyze the objectives of planning process, types of organization and staffing.
C301.2	Understand the meaning of directing, Leadership styles, motivation theories, communication and to establish controlling methods.
C301.3	Understand the meaning and function of Entrepreneur, the role of Entrepreneur in the economic development and to identify business opportunities along with feasibility studies.
C301.4	Understand the procedure to prepare project report and to study Enterprise Resource Planning.
C301.5	Understand the Micro and small enterprise and to Infer the importance of Intellectual property rights and relate the institutional support.

Course Title	Computer Networks and Security
Course Code	18CS52
Course outcomes (COs) : At the end of the course the student will be able to:	
C302.1	Explain principles of application layer protocols
C302.2	Recognize transport layer services and infer UDP and TCP protocols
C302.3	Classify routers, IP and Routing Algorithms in network layer
C302.4	Understand the Wireless and Mobile Networks covering IEEE 802.11 Standard
C302.5	Describe Multimedia Networking and Network Management

Course Title	Database Management Systems
Course Code	18CS53
Course outcomes (COs) : At the end of the course the student will be able to:	
C303.1	Apply the strong foundation of database concepts in technology and practice
C303.2	Use the integrity constraints on a database using RDBMS and use relational algebra and SQL for database manipulation
C303.3	Design and Develop simple database applications
C303.4	Design databases by applying different normal forms
C303.5	Demonstrate the use of concurrency and transactions in database

Course Title	Automata Theory and Computability
Course Code	18CS54
Course outcomes (COs) : At the end of the course the student will be able to:	
C304.1	Acquire fundamental understanding of the core concepts in automata theory and Theory of Computation and able to design and FSM like DFSA, NDFSA and solve related problems. Able to translate between different models of Computation (e.g., Deterministic and Non-deterministic and Software models).
C304.2	Understand Regular languages, Pumping lemma, Regular grammars and design regular expressions and DFSA from Regular Grammars.
C304.3	Design Grammars and Automata (recognizers: PDA, NPDA) for different language classes and become knowledgeable about restricted models of Computation (Regular, Context Free) and their relative powers.
C304.4	Develop skills in formal reasoning and reduction of a problem to a formal model (Ex: Turing Machine), with an emphasis on semantic precision and conciseness.
C304.5	Classify a problem with respect to different models of Computation.

Course Title	Application Development Using Python
Course Code	18CS55
Course outcomes (COs) : At the end of the course the student will be able to:	
C305.1	Examine Python syntax and semantics and analyze the use of Python flow control and functions.
C305.2	Demonstrate proficiency in handling Strings and File Systems.
C305.3	Create, run and manipulate Python Programs using core data structures like Lists and Dictionaries and use Regular Expressions for searching and extracting data from files.
C305.4	Interpret the concepts of Object-Oriented Programming as used in Python.
C305.5	Implement applications related to Network Programming, Web Services and Databases in Python.

Course Title	Unix Programming
Course Code	18CS56
Course outcomes (COs) : At the end of the course the student will be able to:	
C306.1	Understand the architecture of UNIX operating system, features and some basic commands
C306.2	Analyze UNIX file system, directory commands and file related commands for understanding file attributes
C306.3	Demonstrate the use of vi editor and understand the standard files and regular expression along with related commands
C306.4	Implement shell programs and understand file inodes and file links
C306.5	Analyze UNIX processes and its commands, develop Perl Script writing

Course Title	Computer Network Laboratory
Course Code	18CSL57
Course outcomes (COs) : At the end of the course the student will be able to:	
C307.1	Implement the network based messaging application and understand the impact of network parameters on performance
C307.2	Analyze and Compare various networking protocols
C307.3	Demonstrate the working of different concepts of networking
C307.4	Implement, analyze and evaluate networking protocols in NS2 / NS3

Course Title	Database Management Systems Lab with Mini Project
Course Code	18CSL58
Course outcomes (COs) : At the end of the course the student will be able to:	
C308.1	Understand the basic knowledge in database concepts, technology and to groom into well informed database application developers
C308.2	Strong practice in SQL programming through a variety of database problems.
C308.3	Demonstrate the working of different concepts of DBMS
C308.4	Implement, analyze and evaluate the project developed for an application

Course Title	File Structures
Course Code	18CS61
Course outcomes (COs) : At the end of the course the student will be able to:	
C310.1	Understand the fundamentals of file structure and storage mechanism.
C310.2	Explaining the performance of indexing technique in arranging records
C310.3	Analyze the processing techniques in handling large files
C310.4	Differentiate the performance of file management in Sequential and B+ indexing techniques.
C310.5	Explore different hashing technique based on accessing performance.

Course Title	Software Testing
Course Code	18IS62
Course outcomes (COs) : At the end of the course the student will be able to:	
C311.1	Derive test cases for any given problem
C311.2	Compare the different testing techniques
C311.3	Classify the problem into suitable testing model
C311.4	Apply the appropriate technique for the design of flow graph.
C311.5	Create appropriate document for the software artifact.

Course Title	Web Technology and Its Application
Course Code	18IS63
Course outcomes (COs) : At the end of the course the student will be able to:	
C312.1	Design the web page using HTML and CSS
C312.2	Construct and visually format tables and create forms using HTML and CSS
C312.3	Write Client-Side Scripts using JavaScript and Server-Side Scripts using PHP to design a web page
C312.4	Develop Server-side scripts using the principles of object oriented concepts using PHP
C312.5	Design a simple website using various web technologies

Course Title	Object Oriented Modeling and Design
Course Code	18CS642
Course outcomes (COs) : At the end of the course the student will be able to:	
C313A.1	Explain the basic concept and terms used in Object Oriented Modeling and Design and the importance of modeling as a design technique.
C313A.2	Understand Advanced class modeling concepts and state modeling concepts.
C313A.3	Understand Interaction modeling with Examples.
C313A.4	Understand Process overview, System Conception, Domain Analysis, System Design and Estimating System performance.
C313A.5	Understand Overview of class design, Implementation Modeling, Legacy Systems.

Course Title	Introduction to Data Structure and Algorithm
Course Code	18CS652

Course outcomes (COs) : At the end of the course the student will be able to:	
C314A.1	Understand data mining problems and implement the data warehouse
C314A.2	Demonstrate association rules for a given data pattern.
C314A.3	Discuss between classification and clustering solution.
C314A.4	Identify data mining problems and implement the data warehouse
C314A.1	Explain rules related to association, classification and clustering analysis.

Course Title	Software Testing Laboratory
Course Code	18ISL66
Course outcomes (COs) : At the end of the course the student will be able to:	
C315.1	Understand the prerequisites for problems
C315.2	Develop solutions for various scenarios
C315.3	Develop test cases for any given problem
C315.4	Generate appropriate documentation for the software artifact
C315.5	Understand the prerequisites for problems

Course Title	File Structures Laboratory with Mini Project
Course Code	18ISL68
Course outcomes (COs) : At the end of the course the student will be able to:	
C316.1	Understand and apply the Concept of file structure in file design.
C316.2	Apply the concept of file structures for the given experiment.
C316.3	Build Indexing mechanism for efficient retrieval of information from files.
C316.4	Prepare the documents pertaining to file structure and its concepts.

Course Title	Mobile Application Development
Course Code	18CSMP68
Course outcomes (COs) : At the end of the course the student will be able to:	
C317.1	Create, test and debug Android application by setting up Android development Environment.
C317.2	Implement adaptive, responsive user interfaces that work across a wide range of devices.
C317.3	Demonstrate methods in storing, sharing and retrieving data in Android applications.
C317.4	Infer long running tasks and background work in Android applications.
C317.5	Infer role of permissions and security for Android applications.

Course Title	Artificial Intelligence and Machine Learning
Course Code	18CS71
Course outcomes (COs) : At the end of the course the student will be able to:	
C401.1	Explain Artificial Intelligence and Machine Learning.
C401.2	Describe the learning concepts and identify problems relevant to machine learning.
C401.3	Analyse the issues in decision tree learning and representation of decision trees.
C401.4	Demonstrate basics of neural networks and Back Propagation algorithm.
C401.5	Differentiate different supervised machine learning algorithms along with their strengths and weaknesses

Course Title	Big Data Analytics
Course Code	18CS72
Course outcomes (COs) : At the end of the course the student will be able to:	
C402.1	Understand fundamentals of Big Data analytics
C402.2	Explore the Hadoop framework and Hadoop Distributed File system
C402.3	Illustrate the concepts of NoSQL using Mongo DB and Cassandra for Big Data
C402.4	Employ Map Reduce programming model to process the big data
C402.5	Understand various machine learning algorithms for Big Data Analytics, Web Mining and Social Network Analysis

Course Title	User Interface Design
Course Code	18CS734
Course outcomes (COs) : At the end of the course the student will be able to:	
C403A.1	Understand the basic concepts of User Interface Design.
C403A.2	Relate the concepts of User Interface with business functions.
C403A.3	Illustrate the use of Windows and various device based controls in Interface design.
C403A.4	Demonstrate the use of various screen based controls used in Interface design.
C403A.5	Analyse the use of various testing tools and software used in design testing.

Course Title	Robotic Process Automation Design and Development
Course Code	18CS745
Course outcomes (COs) : At the end of the course the student will be able to:	
C404A.1	Understand Basic Programming concepts and the underlying logic/structure
C404A.2	Describe RPA , where it can be applied and how its implemented
C404A.3	Describe the different types of variables, Control Flow and data manipulation techniques
C404A.4	Understand Image, Text and Data Tables Automation
C404A.5	Describe automation to Email and various types of Exceptions and strategies to handle

Course Title	Artificial Intelligence and Machine Learning Laboratory
Course Code	18CSL76
Course outcomes (COs) : At the end of the course the student will be able to:	
C405.1	Understand the implementation procedures for the AI & ML algorithms.
C405.2	Design Java/Python programs for various Learning algorithms.
C405.3	Implement and evaluate AI algorithms using Python programming language.
C405.4	Identify and apply Machine Learning algorithms to solve real world problems.
C405.5	Understand the implementation procedures for the AI & ML algorithms.

Course Title	Project Work Phase - I
Course Code	18CSP77
Course outcomes (COs) : At the end of the course the student will be able to:	
C406.1	Apply the knowledge, identify and Collect information to deduce a problem

	definition for project through detailed review.
C406.2	Identify applicable tools to implement and exhibit the proposed project

Course Title	Internet of Things
Course Code	18CS81
Course outcomes (COs) : At the end of the course the student will be able to:	
C407.1	Assess the genesis and impact of IoT and impact of IoT applications, architectures in real world
C407.2	Illustrate various methods of deploying smart objects and connect them to network
C407.3	Understand the IoT network layer, transport layer and application layer
C407.4	Infer the role of Data Analytics and Security in IoT.
C407.1	Identify sensor technologies for sensing real world entities and understand the role of IoT in various domains of Industry

Course Title	Storage Area Networks
Course Code	18CS822
Course outcomes (COs) : At the end of the course the student will be able to:	
C408A.1	Identify key challenges in managing information and analyze different storage networking technologies and virtualization.
C408A.2	Explain components and the implementation of NAS.
C408A.3	Describe CAS architecture and types of archives and forms of virtualization.
C408A.4	Understand cloud computing infrastructure and its role towards achieving business continuity.
C408A.5	Illustrate the storage infrastructure and management activities.

Course Title	Project Work Phase - II
Course Code	18CSP83
Course outcomes (COs) : At the end of the course the student will be able to:	
C409.1	Design and develop sustainable solution for the betterment of society.
C409.2	Develop a feasible system with scope for future enhancements and continuous lifelong learning.
C409.3	Effectively present the work with professional ethics as an individual or working as a team.

Course Title	Technical Seminar
Course Code	18CSS84
Course outcomes (COs) : At the end of the course the student will be able to:	
C410.1	Identify and review research literature and comprehend solutions that exist to the current Trends in Information Technology
C410.2	Understand the techniques, skills and use applicable tools necessary for presenting the authorized work.
C410.3	Communicate effectively on contemporary areas/trends/developments in Engineering fields and develop technical reports.
C410.4	Effectively present the work with professional ethics as an individual.
C410.5	Understand the impact of authorized work in societal and environmental context.

Course Title	Internship
Course Code	18CSI85
Course outcomes (COs) : At the end of the course the student will be able to:	
C411.1	Enhance the existing engineering knowledge and gain practical experience.
C411.2	Understand through an intensive experience, the nature of workplaces and their associated values, routines and cultures.
C411.3	Integrate and demonstrate existing and new technical knowledge for industrial application
C411.4	Effectively present and write technical reports with professional ethics as an individual /Team on contemporary areas/trends/developments in Engineering fields.
C411.5	Recognize the need for lifelong learning processes with Management skills through critical reflection of internship experiences.

Course Outcomes (COs) of Department of Mechanical Engineering

Course Title	Metal Casting Forming & Joining Process
Course Code	21ME32
Course outcomes (COs) : At the end of the course the student will be able to:	
C202.1	Select appropriate primary manufacturing process and related parameters for obtaining initial shape and size of components
C202.2	Design and develop adequate tooling linked with casting, welding and forming operations.
C202.3	Appreciate the effect of process parameters on quality of manufactured components
C202.4	Demonstrate various skills in preparation of molding sand for conducting tensile, shear and compression tests using Universal sand testing machine.
C202.5	Demonstrate skills in preparation of forging models involving upsetting, drawing and bending operations.

Course Title	Material Science and Engineering
Course Code	21ME33
Course outcomes (COs) : At the end of the course the student will be able to:	
C203.1	Understand the atomic arrangement in crystalline materials and describe the periodic arrangement of atoms in terms of unit cell parameters.
C203.2	Understand the importance of phase diagrams and the phase transformations.
C203.3	Know various heat treatment methods for controlling the microstructure..
C203.4	Correlate between material properties with component design and identify various kinds of defects.
C203.5	Apply the method of materials selection, material data and knowledge sources for computer-aided selection of materials.

Course Title	Thermodynamics
Course Code	21ME34
Course outcomes (COs) : At the end of the course the student will be able to:	
C204.1	Describe the fundamental concepts and principles of engineering thermodynamics.
C204.2	Apply the governing laws of thermodynamics for different engineering applications.
C204.3	Analyse the various thermodynamic processes, cycles and results.
C204.4	Interpret and relate the impact of thermal engineering practices to real life problems.

Course Title	Machine Drawing and GD & T
Course Code	21MEL35
Course outcomes (COs) : At the end of the course the student will be able to:	
C205.1	Interpret the Machining and surface finish symbols on the component drawings.
C205.2	Apply limits and tolerances to assemblies and choose appropriate fits for given assemblies.

C205.3	Illustrate various machine components through drawings
C205.4	Create assembly drawings as per the conventions.

Course Title	Introduction to Python
Course Code	21ME381
Course outcomes (COs) : At the end of the course the student will be able to:	
C206.1	Proficiency in handling of loops and creation of functions.
C206.2	Identify the methods to create and manipulate lists, tuples and dictionaries.
C206.3	Discover the commonly used operations involving regular expressions and file system.
C206.4	Examine working of PDF and word file formats

Course Title	Machining Science and JIGS & Fixtures
Course Code	21ME42
Course outcomes (COs) : At the end of the course the student will be able to:	
C210.1	Demonstrate the Conventional CNC machines and advanced manufacturing process operations
C210.2	Determine tool life, cutting force, and economy of the machining process.
C210.3	Analyze the influence of various parameters on machine tools' performance.
C210.4	Select the appropriate machine tools and process, the Jigs, and fixtures for various applications.

Course Title	Fluid Mechanics
Course Code	21ME43
Course outcomes (COs) : At the end of the course the student will be able to:	
C211.1	Understand the basic principles of fluid mechanics and fluid kinematics
C211.2	Acquire the basic knowledge of fluid dynamics and flow measuring instruments
C211.3	Understand the nature of flow and flow over bodies and the dimensionless analysis
C211.4	Acquire the compressible flow fundamental and basics of CFD packages and the need for CFD analysis.
C211.5	Conduct basic experiments of fluid mechanics and understand the experimental uncertainties.

Course Title	Mechanics of Materials
Course Code	21ME44
Course outcomes (COs) : At the end of the course the student will be able to:	
C212.1	Understand simple, compound, thermal stresses and strains their relations and strain energy.
C212.2	Analyse structural members for stresses, strains and deformations.
C212.3	Analyse the structural members subjected to bending and shear loads.
C212.4	Analyse shafts subjected to twisting loads.
C212.5	Analyse the short columns for stability.

Course Title	Mechanical Measurements and Metrology Laboratory
Course Code	21MEL46
Course outcomes (COs) : At the end of the course the student will be able to:	
C214.1	Understand Calibration of pressure gauge, thermocouple, LVDT, load cell, micrometer.
C214.2	Apply concepts of Measurement of angle
C214.3	Demonstrate measurements using Optical Projector/Tool maker microscope, Optical flats.
C214.4	Analyse Screw thread parameters using 2-Wire or 3-Wire method, gear tooth profile using gear tooth Vernier/Gear tooth micrometre
C214.5	Understand the concepts of measurement of surface roughness.
C214.6	Demonstrate the use of Coordinate Measuring Machine (CMM) / Laser Scanner

Course Title	Introduction to AI and ML
Course Code	21ME482
Course outcomes (COs) : At the end of the course the student will be able to:	
C215.1	Understand the basic principles and goals of AI tasks.
C215.2	Outline the role of AI in different real-time applications.
C215.3	Construct a problem with the suitable AI task.
C215.4	Demonstrate the importance of biology in AI.
C215.5	Survey the future development of AI.

Course Title	Management and Engineering Economics
Course Code	18ME51
Course outcomes (COs) : At the end of the course the student will be able to:	
C301.1	Understand needs, functions, roles, scope and evolution of Management
C301.2	Understand importance, purpose of Planning and hierarchy of planning and also analyse its types
C301.3	Discuss Decision making, Organizing, Staffing, Directing and Controlling.
C301.4	Select the best economic model from various available alternatives.
C301.5	Understand various interest rate methods and implement the suitable one, depreciation values and Prepare the project reports effectively.

Course Title	Design Of Machine Elements- I
Course Code	18ME52
Course outcomes (COs) : At the end of the course the student will be able to:	
C302.1	Apply the concepts of selection of materials for given mechanical components.
C302.2	List the functions and uses of machine elements used in mechanical systems.
C302.3	Apply codes and standards in the design of machine elements and select an element based on the Manufacturer's catalogue.
C302.4	Analyse the performance and failure modes of mechanical components subjected to combined loading and fatigue loading using the concepts of theories of failure.
C302.5	Demonstrate the application of engineering design tools to the design of machine components like shafts, couplings, power screws, fasteners, welded and riveted joints.

Course Title	Dynamics of Machinery
Course Code	18ME53
Course outcomes (COs) : At the end of the course the student will be able to:	
C303.1	Understand the mechanisms for static and dynamic equilibriums in order to determine forces and couples.
C303.2	Understand the balancing of rotating and reciprocating masses in order to determine the magnitude and angular position of balancing masses.
C303.3	Design the governors and gyroscope for stability.
C303.4	Understand the basics of vibration & determine the vibration characteristics of undamped free1-degree freedom system.
C303.5	Understand the basics of vibration concepts and determine the vibration characteristics of damped free and forced single degree freedom systems.

Course Title	Turbo Machines
Course Code	18ME54
Course outcomes (COs) : At the end of the course the student will be able to:	
C304.1	Model studies and thermodynamics analysis of turbo machines.
C304.2	Analyse the energy transfer in Turbo machine with degree of reaction and utilisation factor.
C304.3	Classify, analyse and understand various type of steam turbine.
C304.4	Classify, analyse and understand various type of hydraulic turbine.
C304.5	Understand the concept of radial power absorbing machine and the problems involved during its operation.

Course Title	Fluid Power Engineering
Course Code	18ME55
Course outcomes (COs) : At the end of the course the student will be able to:	
C305.1	Identify and analyse the functional requirements of a fluid power transmission system for a given application.
C305.2	Visualize how a hydraulic/pneumatic circuit will work to accomplish the function.
C305.3	Design an appropriate hydraulic or pneumatic circuit or combination circuit like electro-hydraulics, electro- pneumatics for a given application.
C305.4	Select and size the different components of the circuit.
C305.5	Develop a comprehensive circuit diagram by integrating the components selected for the given application

Course Title	Operations Management
Course Code	18ME56
Course outcomes (COs) : At the end of the course the student will be able to:	
C306.1	Explain the concept and scope of operations management in a business context
C306.2	Recognize the role of Operations management among various business functions and its role in the organizations' strategic planning and gaining competitive advantage.
C306.3	Analyze the appropriateness and applicability of a range of operations management systems/models in decision making.

C306.4	Assess a range of strategies for improving the efficiency and effectiveness of organizational operations.
C306.5	Evaluate a selection of frameworks used in the design and delivery of operations

Course Title	Fluid Mechanics and Machinery
Course Code	18MEL57
Course outcomes (COs) : At the end of the course the student will be able to:	
C307.1	Provides an insight in to the various loses in pipes and to determine the co efficient of friction in the same. Also to determine force developed by impact of jets on vanes
C307.2	Provides an insight in to the calibration of different flow measuring devices in closed and open channels
C307.3	Study the performance characteristics and appreciate the application of different Hydraulic turbines, pumps, compressors and blowers

Course Title	Energy Conversion Laboratory
Course Code	18MEL58
Course outcomes (COs) : At the end of the course the student will be able to:	
C308.1	Perform experiments to determine the properties of fuels and oils.
C308.2	Conduct experiments on engines and draw characteristics, Identify exhaust emission, factors affecting them
C308.3	Test basic performance parameters of I.C. Engine and implement the knowledge in industry.

Course Title	Finite Element Analysis
Course Code	18ME61
Course outcomes (COs) : At the end of the course the student will be able to:	
C310.1	Understand the concept behind formulation methods in FEM.
C310.2	Identify the application and characteristics of FEA elements such as bars, truss, plane and iso-parametric elements
C310.3	Formulate the Finite Element model for beams and shafts subjected to various loading conditions.
C310.4	Develop element characteristic equations and generation of global equations for heat transfer.
C310.5	Apply suitable boundary conditions to a global equation for axi-symmetric and dynamic problems.

Course Title	Design of machine elements-II
Course Code	18ME62
Course outcomes (COs) : At the end of the course the student will be able to:	
C311.1	Solve the problems by applying design principles for the design of springs, belts and wire ropes
C311.2	Illustrate the classifications of gears for the selection of materials for different types of gears and design spur and helical gear for different applications
C311.3	Interpret the understanding of gears by designing bevel and worm gears based on

	strength, dynamic and wear load
C311.4	Design of clutches based on uniform pressure and uniform wear theory and different types of Brakes for various automobile applications
C311.5	Apply design concept of hydrodynamic bearings for different application and select anti-friction bearings for different applications using manufacturers catalogue

Course Title	Heat Transfer
Course Code	18ME63
Course outcomes (COs) : At the end of the course the student will be able to:	
C312.1	Understand the basic modes of heat transfer and apply the basic laws to formulate engineering systems.
C312.2	Understand and apply the basic laws of heat transfer to extended surface, composite material and unsteady heat transfer problems.
C312.3	Analyse heat conduction through numerical methods and apply the fundamental principle to solve radiation heat transfer problems.
C312.4	Analyse heat transfer due to free and forced convective heat transfer through vertical and horizontal plates and tubes.
C312.5	Understand the design and performance analysis of heat exchangers and their practical applications. Condensation and boiling phenomena.

Course Title	Non-Traditional Machining
Course Code	18ME641
Course outcomes (COs) : At the end of the course the student will be able to:	
C313A.1	Compare with traditional machining process and outline its needs.
C313A.2	Illustrate the constructional features and explain the process characteristics, and applications of USM, AJM, and WJM and summarize their performance parameters, advantages, limitations and applications.
C313A.3	Explain the need for Chemical and electro-chemical machining processes and discuss its constructional features, process parameters, process characteristics, applications, advantages and limitations
C313A.4	Explain the constructional feature of EDM & PAM equipment and discuss their process parameters and process characteristics and also discuss their applications, advantages and limitations
C313A.5	Explain the LBM & EBM equipments, understand their parameters, characteristics and their mechanism of metal removal and discuss their applications, advantages and limitations

Course Title	Supply Chain Management
Course Code	18ME653
Course outcomes (COs) : At the end of the course the student will be able to:	
C314A.1	Understand and explain the supply chain importance, key decisions and business strategies to improve performance and reduce cost.
C314A.2	Interpret theoretical logic for make versus buy decisions to select supplier by identifying core processes to create a world-class supply base.
C314A.3	Plan warehouse management system by controlling material handling, transportation and traffic management. Also, design an effective distribution

	network with a model facility location and capacity allocations.
C314A.4	Make use of Network optimization model, decision trees to reduce the impact of uncertainty on network design.
C314A.5	Explain the integration of information technology with supply chain for the effective forecasting and reduced uncertainty for agile supply chain management.

Course Title	Computer Aided Modelling and Analysis Lab
Course Code	18MEL66
Course outcomes (COs) : At the end of the course the student will be able to:	
C315.1	Develop the FE model of bars, trusses, and beams and determine the nodal & elemental values for different boundary conditions.
C315.2	Determine the stresses and displacements in rectangular plates with circular holes using 2D elements subjected to different types of boundary conditions.
C315.3	Determine the temperature distribution in composite walls and pin fins by using 2D & 3D elements subjected to various thermal boundary conditions, Also to analyze the modular natural frequencies in fixed – fixed beam, bar subjected to different boundary conditions.

Course Title	Heat Transfer Lab
Course Code	18MEL67
Course outcomes (COs) : At the end of the course the student will be able to:	
C316.1	Validate Thermal Conductivity, Free Convection, Forced Convection heat transfer coefficients, Emissivity and Stefan-Boltzmann Constant.
C316.2	Characterize Heat Exchanger for effectiveness and heat flux and to Study film, drop wise condensation, Pool Boiling using Critical Heat Flux, time dependent heat Transfer coefficient.
C316.3	Study Refrigeration and Air-Conditioning system and also able to calculate temperature distribution of study and transient heat conduction through plane wall, cylinder and fin using numerical approach.

Course Title	Mini-Project
Course Code	18MEM68
Course outcomes (COs) : At the end of the course the student will be able to:	
C317.1	Demonstrate their understanding and knowledge of engineering within a selected area of their preference
C317.2	Identify, discuss, communicate and justify their project in a systematic manner
C317.3	Work in a team to reproduce, refine and/or improve their project

Course Title	Control Engineering
Course Code	18ME71
Course outcomes (COs) : At the end of the course the student will be able to:	
C401.1	Understand the concepts of control system, control actions and characteristics.
C401.2	Develop the mathematical model for physical systems. (Electrical, Thermal, Mechanical, Electro Mechanical)

C401.3	Estimate the response and error in response of first and second order systems subjected standard input signals.
C401.4	Calculate the Gain/Transfer Function of the system using Block Diagram and Signal Flow Graph.
C401.5	Analyse a linear feedback control system for stability using Hurwitz criterion, Routh's criterion and root Locus technique in complex domain.

Course Title	Computer Aided Design and Manufacturing
Course Code	18ME72
Course outcomes (COs) : At the end of the course the student will be able to:	
C402.1	Able to define automation, CIM, CAD,CAM and analyze Automated flow line to reduce downtime and enhance Productivity
C402.2	Explain different Use of Computer application in manufacturing and solve simple problem of transformation of entity on Computer screen
C402.3	Explain fundamental of Group technology and flexible Manufacturing system. Solve Simple Problem on Line Balancing
C402.4	Able to Develop part programs for simple jobs on CNC machine tools and robot programming.
C402.5	Visualize and appreciate the modern trends in Manufacturing like additive manufacturing, Industry 4.0 and applications of Internet of Things leading to Smart Manufacturing.

Course Title	Total Quality Management
Course Code	18ME734
Course outcomes (COs) : At the end of the course the student will be able to:	
C403A.1	Explain the various approaches of TQM, TQM Framework, Quality Management Systems and about ISO9001 standards.
C403A.2	Infer the characteristics of TQM leaders, ethics, the Deming philosophy and explain strategic planning communication, decision making
C403A.3	Analyze customer perceptions of quality, Customer feedback systems. Customer retention, Employee Involvement, performance appraisal, Motivation.
C403A.4	Apply statistical tools for continuous improvement of systems and processes using the Juran trilogy, improvement strategies, planning, doing, checking (or studying), and acting (PDSA) Cycle, problem-solving methods, Kaizen, reengineering, six sigma, Statistical Process Control: Pareto diagram, process flow diagram, cause and effect diagram, check sheets, histograms, statistical fundamentals, control charts for attributes, scatter diagrams.
C403A.5	Understand and Apply the tools and techniques such as Total Productive Maintenance (TPM), Quality by Design (QbD), and Environmental Management Systems (EMS) for effective implementation of TQM.

Course Title	Additive Manufacturing
Course Code	18ME741
Course outcomes (COs) : At the end of the course the student will be able to:	
C404A.1	Demonstrate knowledge of the broad range of AM processes, devices, capabilities and materials that are available.
C404A.2	Understand the various software tools, processes, and techniques that enable additive manufacturing.

C404A.3	Apply the concepts of additive manufacturing to various techniques that satisfy product development/prototyping requirements.
C404A.4	Analyse the Additive Manufacturing process parameters for optimizing manufacturing technique.
C404A.5	Understand the latest trends and business opportunities in additive manufacturing.

Course Title	Energy and Environment
Course Code	18ME751
Course outcomes (COs) : At the end of the course the student will be able to:	
C405A.1	To describe the forms of energy sources and discuss the factors affecting India's energy development
C405A.2	To Explain energy storage systems and appreciate the importance of energy management and audit
C405A.3	To understand the scope and importance of energy impact on environment and explain the various ecology systems
C405A.4	To outline the causes and remedies related to social issues like global warming, ozone layer depletion, climate change etc
C405A.5	To introduce various acts related to prevention and control of pollution of water and air, forest protection act, wild life protection act etc

Course Title	Computer Integrated Manufacturing Lab
Course Code	18MEL76
Course outcomes (COs) : At the end of the course the student will be able to:	
C406.1	Write the part program using G and M codes, canned cycles, sub programs for the various operations like Turning, Facing, Circular interpolation, Drilling, Boring, Tapping, Thread cutting for turning and milling using high end CAM packages(seeNC).
C406.2	Use of high end CAM packages (CAPS) for machining complex parts, use state of art cutting tools and related cutting parameters; optimize cycle time and Generate NC programs.
C406.3	Understand the operating principles of hydraulics, pneumatics and electro pneumatic systems. Apply this knowledge to automate & improve efficiency of manufacturing.

Course Title	Design Lab
Course Code	18MEL77
Course outcomes (COs) : At the end of the course the student will be able to:	
C407.1	Apply the fundamentals of Mechanical Vibrations to find natural frequency, damping ratio of mechanical systems.
C407.2	Evaluate the Gyroscopic effect, centrifugal forces in Governors and balancing of rotating masses.
C407.3	Analyze the fundamental concepts of stresses in curved beams, photo elastic members and 2D stresses on cylinder surface due to internal pressure and pressure distribution in journal bearing.

Course Title	Energy Engineering
Course Code	18ME81
Course outcomes (COs) : At the end of the course the student will be able to:	
C408.1	To describe the equipment and accessories involved in steam generation
C408.2	To Explain the solar and biomass energy conversion systems
C408.3	To elaborate on geothermal energy, tidal and wind energy generation systems and the terminologies encompassing the conversion of energy through these forms
C408.4	To understand hydel storage systems and ocean thermal energy conversion devices, draw and interpret hydrographs
C408.5	To describe the factors affecting nuclear energy production and the various reactors used for the conversion of nuclear energy to electricity

Course Title	Non-Destructive Testing and Evaluation
Course Code	18ME823
Course outcomes (COs) : At the end of the course the student will be able to:	
C409A.1	Understand NDT testing, its relevance, merits and applications
C409A.2	Explain the principles, equipment, techniques, advantageous, limitations and selection of the surface NDT methods
C409A.3	Describe the aspects associated with thermography and Eddy current testing
C409A.4	Describe and compare the testing methods of ultrasonic and acoustic emission
C409A.5	Explain the principle of radiography, describe its types, classify the filters and screens used and explain the characteristics of the films

Course Title	Project Work
Course Code	18MEP83
Course outcomes (COs) : At the end of the course the student will be able to:	
C410.1	Identify and interpret the realistic mechanical engineering problems and related systems.
C410.2	Apply the basic principles and concepts of mechanical engineering in real world systems based on professional ethics and responsibilities
C410.3	Criticize and experiment to achieve optimum solutions for mechanical engineering problems.
C410.4	Analyse, evaluate and review the obtained solution for problems in mechanical engineering systems.

Course Title	Technical Seminar
Course Code	18MES84
Course outcomes (COs) : At the end of the course the student will be able to:	
C411.1	Information search and analysis of state-of-art technologies in the field of Mechanical Engineering
C411.2	Identify and understand the need to be knowledgeable of contemporary issues as a mechanical engineer
C411.3	Communicate effectively in profession and project management.

Course Title	Internship/ Professional Practice
Course Code	18ME85
Course outcomes (COs) : At the end of the course the student will be able to:	
C412.1	Able to Apply domain knowledge in proposing solution for industry problem
C412.2	Able to develop/implement the design with appropriate techniques, resources and contemporary tools and deliver solution with stipulated planning
C412.3	Understand to work independently and in team
C412.4	Understand how environment pollution is controlled and managed by the industry without effecting society
C412.5	Able to exhibit integrity and ethical behaviour during preparation of Technical document/Report/development of solution.

Course Outcomes (COs) of Department of Mechatronics Engineering

Course Title	Analog And Digital Electronics
Course Code	21MT32
Course outcomes (COs) : At the end of the course the student will be able to:	
C202.1	Explain the characteristics & working principle of Analog & Digital Electronic Circuits.
C202.2	Formulate the relations for Voltage Gain, Frequency of Various Analog Electronic Circuits & Boolean Expressions for Digital Electronic Circuits.
C202.3	Design the Analog & Digital Electronic Circuits for Required Specifications.
C202.4	Design and conduct the experiment on clippers, clampers, amplifiers, 555 timers for the design specifications.
C202.5	Design and conduct the experiment to verify the truth table operation of combinational and sequential circuit.

Course Title	Material Science and Manufacturing Technology
Course Code	21MT33
Course outcomes (COs) : At the end of the course the student will be able to:	
C203.1	Understand mechanical properties of metals. Determine the mechanical properties of given materials through material testing experiments
C203.2	Understand metal, ceramic, polymer, hybrid composite materials, and smart materials and their processing and application. Visualize the microstructure of the specimen
C203.3	Describe the process of casting, different methods to process melting in furnace and cast using moulds.
C203.4	Explain various welding process in manufacturing
C203.5	Interpret metal cutting tools and machines. Prepare/develop a physical model/components of different shapes by performing different machining operations involving conventional machining operation

Course Title	Mechanics of Solids and Fluids
Course Code	21MT34
Course outcomes (COs) : At the end of the course the student will be able to:	
C204.1	Understand the Concept of stress and strain analyze the stress and strain in various cross sectioned bars and composite sections.
C204.2	Analyse the principal stresses and shear stresses in dimensional components.
C204.3	Analysis of circular shaft subjected to torsion and stability of columns.
C204.4	Understand the Concept fluid Mechanics.
C204.5	Analysis of Fluid Kinematics and Fluid Dynamics.

Course Title	Machine Drawing and Gd&T
Course Code	21MTL35
Course outcomes (COs) : At the end of the course the student will be able to:	
C205.1	Interpret the Machining and surface finish symbols on the component drawings.
C205.2	Apply limits and tolerances to assemblies and choose appropriate fits for given assemblies

C205.3	Illustrate various machine components through drawings
C205.4	Create assembly drawings as per the conventions

Course Title	Robotics Ecosystem
Course Code	21MT384
Course outcomes (COs) : At the end of the course the student will be able to:	
C207.1	Understand the functions of different elements of robots
C207.2	Understand the various concepts in robot anatomy and control
C207.3	Describe the knowledge on end effectors and drive systems in robots
C207.4	Apply the knowledge of sensors and end effectors in robotics
C207.5	Analyze the use of different types of robots for different applications.

Course Title	Mathematical Foundations for Computing, Probability & Statistics
Course Code	21MATCS41
Course outcomes (COs) : At the end of the course the student will be able to:	
C209.1	Define and explain the concepts of analytic function and complex potentials. The student can apply the concepts of analytic function and complex potentials to solve problems in fluid flow.
C209.2	Explain the concept of conformal transformation and how it can be used to map one complex plane onto another. analyze engineering problems that involve conformal transformations and line integrals, and develop solutions that are mathematically sound and technically feasible.
C209.3	Use probability distributions to model real-world engineering problems by identifying the different types of discrete and continuous probability distributions and can interpret the results of engineering experiments using probability distributions.
C209.4	Identify the decision variables, objective function, and constraints of a linear programming problem and correctly apply the simplex method to solve a linear programming problem.
C209.5	Define a transportation problem and an assignment problem and analyze the solution to a transportation problem or an assignment problem to determine if it is optimal.

Course Title	Electrical Drives and Control
Course Code	21MT42
Course outcomes (COs) : At the end of the course the student will be able to:	
C210.1	Understand the basic concepts of Electric drives, selection of power rating for drive motors
C210.2	Explain the characteristics of AC & DC Motor drives and conduct an experiment to load test on AC & DC Motor drives.
C210.3	Apply different Starting methods for AC and DC Motor drives.
C210.4	Apply conventional and solid state speed control methods for DC motor drives and conduct experiment to control speed of DC motors
C210.5	Apply conventional and solid state speed control methods for AC motor drives and conduct experiment to control speed of AC motors

Course Title	Hydraulics and Pneumatics
Course Code	21MT43
Course outcomes (COs) : At the end of the course the student will be able to:	
C211.1	Understand different components of pneumatic and hydraulic circuits and determine the performance of hydraulic pump.
C211.2	Demonstrate working of Actuators, valves, solenoids, and pumps
C211.3	Apply concepts of pneumatic and hydraulic to design and develop respective circuits and create the graphical simulation
C211.4	Demonstrate working of pneumatic actuators, control valves circuits and working of air compressor
C211.5	Design pneumatic/electro pneumatic control circuits for various industrial applications using experimental pneumatic kits

Course Title	Microcontrollers and applications
Course Code	21MT44
Course outcomes (COs) : At the end of the course the student will be able to:	
C212.1	Describe Microprocessor, 8051Microcontroller Architecture, and demonstrate the external memory interface.
C212.2	Outline the concepts of addressing modes and illustrate it using assembly programs.
C212.3	Discuss timer and counter operation of 8051 and demonstrate programming using assembly and c code
C212.4	Apply the knowledge of Interrupt and serial port communication to program 8051.
C212.5	Analyze and Interface microcontroller with stepper, dc motor, DAC, LCD, LED and ADC temperature sensor to realize real time application.

Course Title	Mechatronics Lab
Course Code	21MTL46
Course outcomes (COs) : At the end of the course the student will be able to:	
C214.1	Evaluate the performance of the sensors like LVDT, load cell and Thermo couple by Calibration.
C214.2	Develop a various data transfer, arithmetic, logical and code conversion applications using Assembly Language.
C214.3	Design a interface between 8051 and external peripherals for real time applications using C Language
C214.1	Evaluate the performance of the sensors like LVDT, load cell and Thermo couple by Calibration.

Course Title	Technological innovation management and Entrepreneurship
Course Code	18MT51
Course outcomes (COs) : At the end of the course the student will be able to:	
C301.1	Understand the fundamental concepts of Management and Entrepreneurship and opportunities in order to setup a business
C301.2	Describe the functions of Managers, Entrepreneurs and their social responsibilities
C301.3	Explain the components in social responsibility and concepts of entrepreneurship

C301.4	Understand the relevance of Family Business
C305.5	Apply the concepts of feasibility analysis in management problems

Course Title	Design Of Machine Elements
Course Code	18MT52
Course outcomes (COs) : At the end of the course the student will be able to:	
C302.1	Conversant with concepts of strength of materials to estimate the stresses in a machine elements, failure theories, stress concentration, Codes & standards and factor of safety
C302.2	Design keys, couplings and mechanical joints
C302.3	Design shafts for strength and rigidity based on different loading conditions.
C302.4	Design spur gears and helical gears
C302.5	Analyze stresses in journal bearings and also find heat generated and dissipated in journal bearings

Course Title	Virtual Instrumentation
Course Code	18MT53
Course outcomes (COs) : At the end of the course the student will be able to:	
C303.1	Explain the concepts of Virtual Instrumentation and its applications over conventional programming techniques.
C303.2	Describe the basic concepts Data acquisition and its software/hardware requirements
C303.3	Understand the LabVIEW environment and demonstrate VI's using various tools using LabVIEW.
C303.4	Illustrate the applications of various instruments used in data Acquisition and explain the various industry standard protocols in data transfer/ communication.
C303.5	Analyse application oriented VI's using inbuilt application tools in LabVIEW.

Course Title	Hydraulics and Pneumatics
Course Code	18MT54
Course outcomes (COs) : At the end of the course the student will be able to:	
C304.1	Recognize the basic knowledge of hydraulic system & pumps and its major components
C304.2	Describe the construction and working principle of hydraulic actuators, motors and different control components in a hydraulic systems
C304.3	Demonstrate and interpret hydraulic circuits & other maintenance parts like oil filters, seals etc.
C304.4	Recognize the basic knowledge of pneumatic system, actuators and pneumatic control valves.
C304.5	Interpret the pneumatic signal processing elements and applications in electron pneumatic system.

Course Title	Micro And Smart Systems
Course Code	18MT55
Course outcomes (COs) : At the end of the course the student will be able to:	

C305.1	Define Smart Systems and explain its multi-disciplinary aspects
C305.2	Outline the application of microsystems in Sensors and actuators
C305.3	Discuss the various techniques used for fabricating microsystems
C305.4	Demonstrate the functioning and applications of Bipolar Junction Transistors, MOSFET, OPAMPS and PID Controllers
C305.5	Explain techniques for Microelectronics and Micro wafers, Microelectronic Packaging

Course Title	Wireless Network and Communication
Course Code	18MT56
Course outcomes (COs) : At the end of the course the student will be able to:	
C306.1	Explain the Fundamentals of Wireless Communication and Networks.
C306.2	Describe the concept of Wireless body area networks and Wireless personal area networks.
C306.3	Discuss the different wireless coding and modulation techniques.
C306.4	Outline the architecture, protocols and Applications of Wireless Local Area Networking, Wide Area and Metropolitan area Networks.
C306.5	Identify types of networks in Wireless ADHOC networks.

Course Title	VI Lab
Course Code	18MTL57
Course outcomes (COs) : At the end of the course the student will be able to:	
C307.1	Identify the tools, controls and in-built functions available in the LabVIEW environments,
C307.2	Exhibit graphical programming technique using Arrays, Strings, Boolean, File I/O , loops, graphs, structures and clusters.
C307.3	Experiment Virtual Instruments for Temperature control Application Using LabVIEW
C307.4	Deduce Virtual Instruments for real-time batch processes using DAQ.

Course Title	MSST Lab
Course Code	18MTL58
Course outcomes (COs) : At the end of the course the student will be able to:	
C308.1	Understand the concept of finite element method for solving variety of engineering problems
C308.2	Determine the stresses and displacements using 2D elements subjected to different types of boundary conditions.
C308.3	Determine the stresses and displacements using 3D elements subjected to different types of boundary conditions.
C308.4	Understand the pressure sensors calibration using pneumatic system.

Course Title	Programmable Logic Control
Course Code	18MT61
Course outcomes (COs) : At the end of the course the student will be able to:	

C310.1	Describe programmable logic controllers and its architecture.
C310.2	Explain the various bit logic instructions and draw the ladder diagram of it.
C310.3	Describe the timers and counters used in PLC and draw the ladder diagrams and explain the instruction set in PLC.
C310.4	Outline the PLC input and output modules and power supply.
C310.5	Explain the Supervisory Control and Data Acquisition (SCADA) system, its architecture generations, properties, communication requirements and its application.

Course Title	Power Electronics
Course Code	18MT62
Course outcomes (COs) : At the end of the course the student will be able to:	
C311.1	Relate the basic operation and characteristics of power semiconductor devices namely Diode, BJT, MOSFET and thyristor.
C311.2	Realize the function of power thyristor to identify its switching characteristics
C311.3	Examine the operation of single phase, three phase-controlled rectifiers and AC voltage converters for R- load, R-L load.
C311.4	Relate the understanding of thyristor characteristics in understanding of DC choppers and quadrant operation
C311.5	Recognize the principle of inverter with 120- and 180-degree configuration

Course Title	CAMD
Course Code	18MT63
Course outcomes (COs) : At the end of the course the student will be able to:	
C312A.1	Incorporate the understanding of the theory of projection and portray the sectional views of solids using orthographic projections.
C312A.2	Apply the principles of orthographic projection in order to visualize and develop the orthographic views of machine components
C312A.3	Comprehend the semantics and syntax of CAD software to develop engineering drawing. Model machine components and develop machine drawing in 2D &3D of different fasteners. Recognize to use engineering tools in lifelong learning.
C312A.4	Imparting fundamental knowledge to draw and understand the applications of mechanical joints, riveted joints & coupling
C312A.5	Improve their visualization skills and produce the assembly drawings using part drawings.

Course Title	Computer Integrated Manufacturing
Course Code	18MT645
Course outcomes (COs) : At the end of the course the student will be able to:	
C313A.1	Understand the fundamental knowledge of CIM
C313A.2	Explain the general concepts of high volume production. Formulate flow line analysis and line balancing of automated & assembly system
C313A.3	Understand the automated assembly system.
C313A.4	Understand computerized manufacturing, planning & CNC centers.
C313A.5	Apply CIM technology for providing manufacturing solutions

Course Title	Robotics and Automation
Course Code	18MT651
Course outcomes (COs) : At the end of the course the student will be able to:	
C314A.1	Understand the basic concepts of robot.
C314A.2	Understand the types of power sources and analyze the functions of sensors in a robot.
C314A.3	Understand manipulators, actuators and grippers
C314A.4	Understand the basics of industrial automation and safety
C314A.1	Understand the concepts of material handling system and automatic identification systems

Course Title	PLC & SCAADA Lab
Course Code	18MTL66
Course outcomes (COs) : At the end of the course the student will be able to:	
C315.6	Draw the ladder diagram for various logical executions and also temperature sensing using PLC.
C315.2	Construct the Multiplexer and Demultiplexer Circuit and thermal ON/OFF controller using PLC
C315.3	Construct the ladder diagram to verify the logic gates using Interfacing of Lamp & button with PLC and also use the PLC with SCADA for parameter sensing.
C315.4	Draw and study the counters and timers used in PLC and the combination of both using some examples

Course Title	Power Electronics Lab
Course Code	18MTL67
Course outcomes (COs) : At the end of the course the student will be able to:	
C316.1	Understand and Verify the characteristics of different power electronic devices.
C316.2	Analyse the power devices to control the operation of power devices.
C316.3	Apply the concepts of commutation for SCR Circuits
C316.4	Apply the concepts of Power Electronic Devices to study and understand Speed control Characteristics

Course Title	Mini-Project
Course Code	18MTMP68
Course outcomes (COs) : At the end of the course the student will be able to:	
C317.1	Demonstrate their understanding and knowledge of engineering within a selected area of their preference
C317.2	Identify, discuss, communicate and justify their project in a systematic manner
C317.3	Work in a team to reproduce, refine and/or improve their project

Course Title	Industrial Robotics
Course Code	18MT71
Course outcomes (COs) : At the end of the course the student will be able to:	
C401.1	Describe the concepts of automation, robot anatomy, robot programming, robotic control and applications of robotics.
C401.2	Annotate the concepts of robot motion analysis, gripper design and sensors used in the field of industrial robotics.
C401.3	Discuss the role of machine vision as well as AI in the field of industrial robotics and learn the concepts and methods related to robot programming.
C401.4	Describe the robotic cell layouts and its design consideration and also understand the concepts related to material transfer, machine loading/unloading applications.
C401.5	Describe the applications of industrial robot in automatic processing applications and Assembly & Inspection.

Course Title	Thermal Engineering
Course Code	18MT72
Course outcomes (COs) : At the end of the course the student will be able to:	
C402.1	Explain thermodynamic systems, properties, Zeroth law of thermodynamics, temperature scales and determine the heat, work and energy interaction.
C402.2	Determine internal energy, enthalpy for flow & non flow process using First and Second Law of Thermodynamics.
C402.3	Determine the air standard efficiency of Otto, diesel dual cycle and to develop the differential equation of heat conduction by energy conservation.
C402.4	Appreciate the principles of 1D heat conduction as applied to composite walls, to appreciate the application of boundary layer theory to heat convection. Understand the mechanism and variables involved in free convection.
C402.5	To analyse the mechanism of forced convection for internal and external fluid flow. To determine heat transfer by radiation between black and grey surfaces. Understand electrical analogy through applications like radiation shield

Course Title	Real Time Systems
Course Code	18MT733
Course outcomes (COs) : At the end of the course the student will be able to:	
C403A.1	To understand the emerging concepts in theory and application of real time system and computer control.
C403A.2	To understand and analyze the Hardware requirements of RTS developing methodologies.
C403A.3	To have a knowledge of software requirements to formulate and analyze the problem in RTS.
C403A.4	To understand the basics of RTS, Hardware/Software requirements of RTS, operating system concepts.
C403A.5	Ability to apply the knowledge of different development methodologies for the implementation of RTS

Course Title	Digital Image Processing
Course Code	18 MT744
Course outcomes (COs) : At the end of the course the student will be able to:	
C404A.1	Describe the concepts of Digital Image Processing Steps, components of digital image processing and Visual perception
C404A.2	To illustrate the image formation, Sampling and quantization process.
C404A.3	To demonstrate the properties and application of orthogonal and unitary, DFT, DCT, Hadamand and Haar transformation techniques.
C404A.4	Exhibit the Image enhancement in spatial domain using basic gray level, histogram techniques and in frequency domain using smoothing and sharpening methods.
C404A.5	Compare different models for Image degradation & restoration and outline the basics of color models, Pseudo-color, color image processing.

Course Title	Mechatronics System Design
Course Code	18 MT752
Course outcomes (COs) : At the end of the course the student will be able to:	
C405A.1	Understand the key elements and integrated components in mechatronics system.
C405A.2	Demonstrate the modeling of Mechatronics System using block diagram.
C405A.3	Classify the difference between sensors and actuators and analyze the solution for linear and nonlinear systems.
C405A.4	Demonstrate data acquisition and processing of signal.
C405A.5	Interpret the real time interfacing of mechatronics system.

Course Title	Robotics Lab
Course Code	18MTL76
Course outcomes (COs) : At the end of the course the student will be able to:	
C406.1	Demonstrate the working of robot programming for point-to-point operations on a process-station.
C406.2	Demonstrate the working of robot programming for drilling operation using simulation tool
C406.3	Demonstrate the working of robot programming for multimove operation using simulation tool
C406.4	Create a robot station for tracking operation using simulation tools
C406.1	Demonstrate the working of robot programming for point-to-point operations on a process-station.

Course Title	Thermal -Laboratory
Course Code	18MTL77
Course outcomes (COs) : At the end of the course the student will be able to:	
C407.1	Perform experiments to determine the thermal conductivity of a metal rod.
C407.2	Conduct experiments to determine convective heat transfer coefficient for free and forced convection and correlate with theoretical values.
C407.3	Estimate the effective thermal resistance in composite slabs and efficiency in pin-fin

C407.4	Determine surface emissivity of a test plate.
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Course Title	Project Phase- I
Course Code	18MTP78
Course outcomes (COs) : At the end of the course the student will be able to:	
C408.1	Research, analysis, and presentation of state-of-art technologies in the field of Mechatronics Engineering
C408.2	Identify and understand the need to be knowledgeable of contemporary issues as a mechatronics engineer

Course Title	Automotive Electronics & Hybrid Vehicles
Course Code	18MT81
Course outcomes (COs) : At the end of the course the student will be able to:	
C409.1	Describe the automotive electronics domain for various Engine parts.
C409.2	Discuss the concepts of Sensor, Actuator, Communication and Measurement System.
C409.3	Annotate the concepts of Communication and Measurement System.
C409.4	Apply the extent and nature of electronic circuitry in automotive systems including monitoring and control circuits for engines, transmissions, brakes, steering,
C409.5	Interpret the types and architectures of alternative vehicles and their analysis methods.

Course Title	Communication System
Course Code	18MT822
Course outcomes (COs) : At the end of the course the student will be able to:	
C410A.1	Define communication system and explain basic signal processing operations and sampling theorem
C410A.2	Define Amplitude Modulation (Time and Frequency) [Generation and Detection]
C410A.3	Define Frequency Modulation (Time and Frequency) [Generation and Detection]
C410A.4	Define Waveform Coding Techniques (PAM, TDM, PCM)
C410A.5	Explain various Spread Spectrum Modulation

Course Title	Project
Course Code	18MTP83
Course outcomes (COs) : At the end of the course the student will be able to:	
C411.1	Apply the basic principles and concepts of mechatronics engineering in real world systems based on professional ethics and responsibilities
C411.2	Criticize and experiment to achieve optimum solutions for mechatronics engineering problems.
C411.3	Analyze, evaluate and review the obtained solution for problems in mechanical engineering systems.

Course Title	Technical Seminar
Course Code	18MTS84
Course outcomes (COs) : At the end of the course the student will be able to:	
C412.1	Identify and review research literature and comprehend solutions that exist to

	Mechatronics problems.
C412.2	Identify promising new directions of various cutting-edge technologies
C412.3	Impart skills in preparing detailed report describing the project and results
C412.4	Effectively communicate by making an oral presentation before an evaluation committee
C412.5	Understand the impact of authorized work in societal and environmental context.

Course Title	Internship
Course Code	18MTI85
Course outcomes (COs) : At the end of the course the student will be able to:	
C413.1	Able to Apply domain knowledge in proposing solution for industry problem
C413.2	Able to develop/implement the design with appropriate techniques, resources and contemporary tools and deliver solution with stipulated planning
C413.3	Understand to work independently and in team
C413.4	Understand how environment pollution is controlled and managed by the industry without effecting society
C413.5	Able to exhibit integrity and ethical behavior during preparation of technical document/Report/development of solution.

Course Outcomes (COs)

2022 & 2020 Scheme

**Department of Master of Business
Administration**

Course Outcomes (COs) of Department of Master of Business Administration

Course Title	Principles of Management and Organisational Behaviour
Course Code	22MBA11
Course outcomes (COs) : At the end of the course the student will be able to:	
C101.1	Understand the basics of Management theories and managerial competencies
C101.2	Apply the functions of management and decision making concepts to different aspects of business
C101.3	Analyze the different approaches to organization behavior and understand the concept of personality and motivation
C101.4	Understand the concept of group dynamics, teamwork and contribute to team environment
C101.5	Apply the concept of organizational power, politics and culture for effective functioning of organization
C101.6	Understand the concept of change in the organization and adopt oneself to manage stress

Course Title	Entrepreneurship Development
Course Code	22MBA12
Course outcomes (COs) : At the end of the course the student will be able to:	
C102.1	Understand the concepts of Entrepreneurship and the role of creativity in it
C102.2	Apply concepts to develop a business plan
C102.3	Understand role of marketing and different forms of business
C102.4	Understand various sources of funding and institutions supporting entrepreneurs.
C102.5	Apply legal aspects and understand the various applications of legislations.
C102.6	Apply understand the ways of incorporating a company and to know the Intellectual property rights

Course Title	Accounting for Managers
Course Code	22MBA13
Course outcomes (COs) : At the end of the course the student will be able to:	
C103.1	Understand the Concepts of Journal, Ledger and Trail Balance
C103.2	Prepare Final accounts of companies in Vertical form
C103.3	Analyse Financial statements through techniques like Cash flow Statement and Ratio Analysis
C103.4	Understand Management accounting and take Make/Buy decisions, prepare Cost Volume Profit analysis
C103.5	Understand cost accountancy and prepare Flexible Budget and conduct Variance Analysis
C103.6	Comprehend emerging Issues in Accounting and Computerized Accounting

Course Title	Statistics for Managers
Course Code	22MBA14
Course outcomes (COs) : At the end of the course the student will be able to:	

C104.1	Understand the basic statistical theories and analyze data set using descriptive statistics.
C104.2	Apply different Correlation and regression techniques in business/real-life situations.
C104.3	Apply the concept of probability in decision making
C104.4	Understand and apply various methods of estimating trends and seasonal index under Time series.
C104.5	Understand and apply data analysis technique by using different hypothesis testing.
C104.6	Gain knowledge about analytical package of MS Excel

Course Title	Marketing Management
Course Code	22MBA15
Course outcomes (COs) : At the end of the course the student will be able to:	
C105.1	Develop an ability to assess the impact of the environment on marketing function.
C105.2	To formulate marketing strategies that incorporate psychological and sociological factors which influence buying
C105.3	Understand concept of Branding, development of product and significance of market segmentation, targeting and positioning.
C105.4	Identifying marketing channels and the concept of product distribution
C105.5	Identifying techniques of sales promotion, significance of marketing research.
C105.6	Synthesize ideas into a viable marketing plan for various modes of marketing

Course Title	Managerial Communication
Course Code	22MBA16
Course outcomes (COs) : At the end of the course the student will be able to:	
C106.1	Understand the basic concepts involved with communication in organizations
C106.2	Apply concepts of Oral communication in the business context
C106.3	Apply the concepts and mechanics of written communication in the context of business
C106.4	Apply effective means of communication in Reports, cases and meetings
C106.5	Apply the concepts of Employment communication in the organization context
C106.6	Understand concepts involved in Interpersonal communication, like conflict resolution and use of technology.

Course Title	Human Resource Management
Course Code	22MBA21
Course outcomes (COs) : At the end of the course the student will be able to:	
C201.1	Gain understanding in the field of Human Resource Concepts, functions and models of HRM.
C201.2	Synthesize knowledge on effectiveness of recruitment process, sources and understanding of selection and training process
C201.3	Understand the concept of performance appraisal process, compensation and industrial relations
C201.4	To apply the functioning of HRM in small and medium enterprises
C201.5	To identify the innovations in HRM

C201.6	To evaluate the future trends of HRM and list out HRM leadership and transformation roles
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Course Title	Financial Management
Course Code	22MBA22
Course outcomes (COs) : At the end of the course the student will be able to:	
C202.1	Understand the basics of Finance and the Indian financial system
C202.2	Apply time value of money
C202.3	Understand sources of Finance and apply Cost of Capital
C202.4	Evaluate the capital budgeting process and take investment decisions
C202.5	Estimate working capital requirements
C202.6	Analyze the capital structure and dividend decisions

Course Title	Research Methodology and IPR
Course Code	22MBA23
Course outcomes (COs) : At the end of the course the student will be able to:	
C203.1	Understand various research approaches, techniques and process which is appropriate for business decision making.
C203.2	Apply a range of quantitative or qualitative research techniques to business and day to day management problems.
C203.3	Identify the appropriate sampling technique for any type of business research
C203.4	Apply suitable data collection method and understand different measurement & scaling techniques of data
C203.5	Select an appropriate data analysis technique and to understand the process of writing business research report
C203.6	Apply the advanced excel functions for data analysis

Course Title	Operations Research
Course Code	22MBA24
Course outcomes (COs) : At the end of the course the student will be able to:	
C204.1	Get an insight into the fundamentals of Operations Research and its definition, characteristics and phases
C204.2	Develop mathematical models using linear programming technique to take informed decision
C204.3	Make decision under various decision making environments.
C204.4	Understand and practice allocation problems, Transportation problems to get feasible and optimal solution
C204.5	Understand the usage of game theory and application of assignment Problems
C204.6	Understand the use of network techniques for successful project implementation

Course Title	Strategic Management
Course Code	22MBA25
Course outcomes (COs) : At the end of the course the student will be able to:	
C205.1	Acquire the fundamental knowledge and importance of strategic management and

	identify company's strategy and its business model
C205.2	Analyse company's external environment and be able to perform industry analysis
C205.3	Analyse the internal environment of a company using theoretical models
C205.4	Formulate a strategy by understanding the strategic management process and describe the objectives and values to the strategic management process
C205.5	Implement the learning's of business level strategies and understand how innovations promotes strategy implementation
C205.6	Focus and establish strategic controls

Course Title	Managerial Economics
Course Code	22MBA26
Course outcomes (COs) : At the end of the course the student will be able to:	
C206.1	Understand the application of Economic Principles in Management decision making.
C206.2	Understand the concept of demand and supply function and apply them for effective functioning firm and Industry.
C206.3	Apply the concepts of production and cost for the optimization of production function of a firm.
C206.4	Anlyse the market conditions to design the competitive strategies like pricing, product differentiation etc.
C206.5	Understand the dynamics of macroeconomic variables to take managerial decisions.
C206.6	Understand the impact of changing fiscal and monitory policies on the performance of a firm.

Course Title	Emerging Exponential Technologies
Course Code	20MBA301
Course outcomes (COs) : At the end of the course the student will be able to:	
C301.1	Understand the evolution of Industrial revolution 4.0 and future trends in emerging technologies.
C301.2	Apply data science as a tool for decision making in management.
C301.3	Apply different types of Artificial Intelligence in various market segments like health, business, and agriculture.
C301.4	Apply the concept of IOT working process in developing smart objects.
C301.5	Apply the fundamentals of AR & VR and learn the implication of its development in the filed of education, medical, entertainment
C301.6	Analyze the importance of ethics in technology and understand basics of other technologies like Block chain, cloud additive manufacturing etc.

Course Title	Technology & Operational Strategy
Course Code	20MBA302
Course outcomes (COs) : At the end of the course the student will be able to:	
C302.1	Acquire the basic knowledge about the concepts of production and operation management

C302.2	Understand the basic concepts of process mapping
C302.3	Understand lean manufacturing and waste management
C302.4	Learn various production management systems
C302.5	Develop strategies of Total quality management
C302.6	Understand the roles of ISO standards and Quality systems

Course Title	Services Marketing
Course Code	20MBAMM303
Course outcomes (COs) : At the end of the course the student will be able to:	
CMM303A.1	Develop an understanding about the various concepts and importance of Services Marketing
CMM303A.2	To understand ways of market research for customer expectation
CMM303A.3	Gain in depth understanding of customer defined service standards
CMM303A.4	To evaluate employees role in service designing and delivery
CMM303A.5	To enhance knowledge and understanding about emerging issues and trend in service sector
CMM303A.6	To implement service strategies on gaining knowledge about physical evidences in services

Course Title	Investment Management
Course Code	20MBAFM303
Course outcomes (COs) : At the end of the course the student will be able to:	
CFM303B.1	Understand the various Instruments for Investment and financial market operations
CFM303B.2	Assess the risk and return associated with investments
CFM303B.3	Do the valuation of debt and equity instruments
CFM303B.4	Able to analyse the economy, industry and company framework for investment management decision.
CFM303B.5	Understand the modern theories of Portfolio management.
CFM303B.6	Analyse the performance of given portfolio

Course Title	Recruitment & Selection
Course Code	20MBAHR303
Course outcomes (COs) : At the end of the course the student will be able to:	
CHR303C.1	Develop a greater understanding for strategies pertaining to work force planning and recruitment analytics
CHR303C.2	To understand Job Analysis that facilitates students to design a job description, job design for various levels of employees
CHR303C.3	Acquire Knowledge on Job evaluation and the procedures applied in various industries
CHR303C.4	Analyse the selection and interview strategies followed in various industries.
CHR303C.5	Illustrate the application of testing and assessment in various industries.
CHR303C.6	Evaluate the hiring management system, assessment of candidates and job fit in organisations

Course Title	Marketing Research & Analytics
Course Code	20MBAMM304
Course outcomes (COs) : At the end of the course the student will be able to:	
CMM304A.1	Comprehend the objective of Market research & its application in solving marketing problems
CMM304A.2	Analyze the use of data collection methods, sampling design techniques, measurement methods
CMM304A.3	understand and apply various decision support systems in market research
CMM304A.4	Generalize and interpret the data of various measurement techniques
CMM304A.5	Analyze the theoretical aspects of predictive analysis
CMM304A.6	Analyse the process of new products

Course Title	Direct Taxation
Course Code	20MBAFM304
Course outcomes (COs) : At the end of the course the student will be able to:	
CFM304B.1	Understand the Basics of Taxation and process of computing residential status
CFM304B.2	Calculate taxable income under the head Salary
CFM304B.3	Calculate taxable income under the head profits & gains of Business and Profession
CFM304B.4	Calculate taxable income under the head capital gains
CFM304B.5	Understand deductions and calculation of tax liability of Individuals.
CFM304B.6	Know the corporate tax system.

Course Title	HR Analytics
Course Code	20MBAHR304
Course outcomes (COs) : At the end of the course the student will be able to:	
CHR304C.1	Understand business analytics and its challenges
CHR304C.2	Understand HR Analytics, its future and scope of Big Data in HR Analytics
CHR304C.3	Apply HR metrics in the context of HR Dashboards
CHR304C.4	Understand the concept of Correlation and regression and analyse using open source software such as PSPP and R Commander.
CHR304C.5	Apply HR Analytics using ANOVA
CHR304C.6	Apply HR Analytics using Logistics Regression, Factor analysis and cluster analysis.

Course Title	Internship
Course Code	20MBAIN307
Course outcomes (COs) : At the end of the course the student will be able to:	
CIN307.1	To understand the functioning of an organisation
CIN307.2	To gain practical experience in dealing with people and situations

Course Title	B2B Marketing Management
Course Code	20MBAMM401
Course outcomes (COs) : At the end of the course the student will be able to:	
CMM401A.1	Understand the concept and significance of B2B marketing.
CMM401A.2	Understand the purchase process and analyse the factors affecting purchasing decisions.
CMM401A.3	Identify the challenges of segmentation in B2B markets and B2B positioning.
CMM401A.4	Able to create an integrated marketing communications plan.
CMM401A.5	Analyse the appropriate situation to apply the concept of Key Account Management
CMM401A.6	Learn managing innovation in B2B context and appreciate the importance of pricing-cost

Course Title	Risk Management & Insurance
Course Code	20MBAFM401
Course outcomes (COs) : At the end of the course the student will be able to:	
CFM401B.1	Understand various types of risks.
CFM401B.2	Assess the process of identifying and measuring the risk.
CFM401B.3	Acquaint with the functioning of life Insurance in risk management
CFM401B.4	Understand the different types of Life Insurance contracts
CFM401B.5	Understand General insurance contracts.
CFM401B.6	Comprehend the management of Insurance companies

Course Title	Organisational Leadership
Course Code	20MBAHR401
Course outcomes (COs) : At the end of the course the student will be able to:	
CHR401C.1	Understand the fundamental concepts of Leadership
CHR401C.2	Apply various approaches of Leadership to situations
CHR401C.3	Apply various theories of Leadership to situations
CHR401C.4	Understand Leadership profiles of different countries
CHR401C.5	Understand ethical leadership
CHR401C.6	Analyse successful Leadership practices

Course Title	Logistics and Supply Chain Management
Course Code	20MBAMM402
Course outcomes (COs) : At the end of the course the student will be able to:	
CMM402A.1	Understand basic concepts of Logistics and supply chain management
CMM402A.2	understand the role of warehouse management system
CMM402A.3	Gain knowledge about Inventory Management
CMM402A.4	Gain knowledge on modes of transportation and transportation infrastructure
CMM402A.5	Get an insight into the role of technology in logistics and supply chain management.
CMM402A.6	Understand international logistic and supply chain mechanism

Course Title	Financial Derivatives
Course Code	20MBAFM402
Course outcomes (COs) : At the end of the course the student will be able to:	
CFM402B.1	Understand the basics of financial derivatives
CFM402B.2	Apply the forwards and futures to hedge the price risk
CFM402B.3	Apply the option trading and hedging strategies
CFM402B.4	Assess the application of financial swaps
CFM402B.5	Understand the working mechanism of commodity derivatives
CFM402B.6	Understand the concepts of VAR and credit derivatives

Course Title	Personal Growth and Interpersonal Effectiveness
Course Code	20MBAHR402
Course outcomes (COs) : At the end of the course the student will be able to:	
CHR402C.1	Understanding the dynamics of various personality traits which promotes personal growth
CHR402C.2	Analyze the concepts of human personality, behaviour and functioning of mind
CHR402C.3	Apply the theories to improve workplace effectiveness through psychometrics test
CHR402C.4	Understand the categorize different PG and IE practices and to be followed in the Organisation
CHR402C.5	create and reconstruct Leadership required to manage the Human Resources in the Organisation
CHR402C.6	appraise and judge the practical applicability of various PG and IE practices to be followed in the Organisation

Course Title	Digital marketing
Course Code	20MBAMM403
Course outcomes (COs) : At the end of the course the student will be able to:	
CMM403A.1	Recognise appropriate e-marketing objectives by gaining practical insights on digital marketing
CMM403A.2	Design Buying models on gaining knowledge of display advertising
CMM403A.3	Apply the use of search engine advertising in analyse performance and building successful strategies
CMM403A.4	Acquire knowledge on social media for designing market activities
CMM403A.5	To apply the knowledge of mobile analytics and advertising in designing mobile marketing activities
CMM403A.6	To illustrate the use of search engine optimization in optimization of business activities.

Course Title	Indirect Taxation
Course Code	20MBAFM403
Course outcomes (COs) : At the end of the course the student will be able to:	
CFM403B.1	Understand the concept of GST system in India
CFM403B.2	Understand Levy and collection of GST in India

CFM403B.3	Analyse the time and value of supply under GST
CFM403B.4	Understand the concept of registration, it's procedure and Input Tax Credit under GST
CFM403B.5	Understand the concept and different types under customs duty and apply valuation theory under customs
CFM403B.6	Understand import and export procedure under customs

Course Title	International Human Resource Management
Course Code	20MBAHR403
Course outcomes (COs) : At the end of the course the student will be able to:	
CHR403C.1	Identify the application of IHRM concepts in managing an organization
CHR403C.2	Understand the strategic approaches to HR aspects
CHR403C.3	Learn and identify the performance management systems of different economies
CHR403C.4	Analyse the HRM systems adopted in an organization related to international employees
CHR403C.5	Understand various approaches in managing international organization
CHR403C.6	Identify the various models of culture and understand its applications.

Course Title	Project Work
Course Code	20MBAPR407
Course outcomes (COs) : At the end of the course the student will be able to:	
CPR407.1	Design a research project and apply concepts of management
CPR407.2	Suggest solutions to given problem situations

Course Outcomes (COs)

2022 Scheme

**Department of Master of Computer
Applications**

Course Outcomes (COs) of Department of Master of Computer Applications

Course Title	Mathematical Foundation for Computer Applications
Course Code	22MCA11
Course outcomes (COs) : At the end of the course the student will be able to:	
22MCA101.1	Apply the fundamentals of set theory for a given problem; obtain eigenvalues and eigenvectors for a given matrix.
22MCA101.2	Solve the given problem by applying the Mathematical logic concepts.
22MCA101.3	Understand the concept of relations and its properties.
22MCA101.4	Apply the types of distribution, evaluate the mean and variance for the given problem.
22MCA101.5	Model the given problem by applying the concepts of graph theory.

Course Title	Operating System Concepts
Course Code	22MCA12
Course outcomes (COs) : At the end of the course the student will be able to:	
22MCA102.1	Analyze the basic Operating System Structure and concept of Process Management
22MCA102.2	Analyse the given Synchronization/ Deadlock problem to solve and arrive at valid conclusions
22MCA102.3	Analyse OS management techniques and identify the possible modifications for the given problem context
22MCA102.4	Ability to design and solve synchronization problems.
22MCA102.5	Ability to simulate and implement operating system concepts such as scheduling, Deadlock management, file management, and memory management.

Course Title	Data structures with Algorithms
Course Code	22MCA13
Course outcomes (COs) : At the end of the course the student will be able to:	
22MCA103.1	Analyze step by step and develop algorithms to solve real world problems.
22MCA103.2	Evaluate the Expressions like postfix, prefix conversions.
22MCA103.3	Implementing various data structures viz. Stacks, Queues, Linked Lists, Trees and Graphs.
22MCA103.4	Understanding Types of memory allocations and operation on them
22MCA103.5	Understanding various searching & sorting techniques.

Course Title	Computer Networks
Course Code	22MCA14
Course outcomes (COs) : At the end of the course the student will be able to:	
22MCA104.1	Apply the basic concepts of networks like protocol, internet and OSI layers
22MCA104.2	Understand signal transmissions at physical layer

22MCA104.3	Demonstrate the various Switching networks
22MCA104.4	Learn various error detection and correction techniques
22MCA104.5	Gain knowledge on data link layer protocols

Course Title	Design and Analysis of Algorithms
Course Code	22MCA15
Course outcomes (COs) : At the end of the course the student will be able to:	
22MCA105.1	Describe the basic algorithm design strategies and use them for devising new solution to various problem
22MCA105.2	Analysis of various Algorithm to compute its complexity
22MCA105.3	Understand different types of algorithm and difference between them
22MCA105.4	Understanding Various dynamic programming methods
22MCA105.5	Understanding deterministic and probabilistic Algorithm

Course Title	Data Structures with Algorithms Laboratory
Course Code	22MCAL16
Course outcomes (COs) : At the end of the course the student will be able to:	
22MCA106.1	Evaluate the Expressions like postfix, prefix conversions.
22MCA106.2	Implementing various data structures viz. Stacks, Queues, Linked Lists, Trees and Graphs

Course Title	Computer Networks Laboratory
Course Code	22MCAL17
Course outcomes (COs) : At the end of the course the student will be able to:	
22MCA107.1	Understand network simulation environment
22MCA107.2	implement various network algorithms

Course Title	Research Methodology and IPR
Course Code	22RMI18
Course outcomes (COs) : At the end of the course the student will be able to:	
22MCA108.1	Identify suitable research methods and articulate research steps in a proper sequence for the given problem
22MCA108.2	Carryout literature survey, define the problem statement and suggest suitable solution for the given problem and present in the format of research paper
22MCA108.3	Analyse the problem and conduct experimental design with the samplings
22MCA108.4	Perform data collection from various sources segregate primary and secondary data
22MCA108.5	Apply some concepts/sections of Copy Right Act/Patent Act/Cyber Law/Trade mark to the given case and develop - conclusions

Course Title	Basics of Programming and CO
Course Code	22MCA110-BC *

Course outcomes (COs) : At the end of the course the student will be able to:	
22MCA109.1	Demonstrate the key concepts introduced in the C programming by writing and executing programs
22MCA109.2	Demonstrate the concepts of structures and pointers for the given application/problem.
22MCA109.3	Implement the single/multi-dimensional array for the given problem
22MCA109.4	Demonstrate the application of logic gates in solving some societal/industrial problems
22MCA109.5	Analyze how memory organization, operations, instruction sequencing and interrupts are useful in executing the given program.

Course Title	Database Management System
Course Code	22MCA21
Course outcomes (COs) : At the end of the course the student will be able to:	
22MCA110.1	Identify, analyze and define database objects, enforce integrity constraints on a database using RDBMS
22MCA110.2	Use Structured Query Language (SQL) for database manipulation and also demonstrate the basic of query evaluation.
22MCA110.3	Develop applications using tuple and domain relation expression from queries
22MCA110.4	Ability to apply normal forms on database
22MCA110.5	Design and build simple database systems and relate the concept of transaction, concurrency control and recovery in database

Course Title	Object Oriented Programming Using Java
Course Code	22MCA22
Course outcomes (COs) : At the end of the course the student will be able to:	
22MCA111.1	Use object-oriented programming concepts to solve real world problems.
22MCA111.2	Describe the concept of interface and abstract classes to define generic classes.
22MCA111.3	Demonstrate the implementation of inheritance (multilevel, hierarchical and multiple) by using extend and implement keywords and abstract classes.
22MCA111.4	Demonstrate the user defined exceptions by exception handling keywords (try, catch, throw, throws and finally)
22MCA111.5	Understand the process of graphical user interface design and implementation using AWT or swing.

Course Title	Software Engineering
Course Code	22MCA23
Course outcomes (COs) : At the end of the course the student will be able to:	
22MCA112.1	Outline software engineering principles and activities involved in building large software programs.
22MCA112.2	Identify ethical and professional issues and explain why they are of concern to software engineers.
22MCA112.3	Explain the fundamentals of object-oriented concepts.

22MCA112.4	Differentiate system models, use UML diagrams and apply design patterns.
22MCA112.5	Discuss the distinctions between validation testing and defect testing.

Course Title	Web Technologies
Course Code	22MCA24
Course outcomes (COs) : At the end of the course the student will be able to:	
22MCA113.1	Creating the small web page using xhtml5.
22MCA113.2	Use of CSS and JavaScript.
22MCA113.3	Creating responsive web pages using Bootstrap
22MCA113.4	Use of JQuery in the webpages
22MCA113.5	Learn Angular JS with Example

Course Title	Data Mining and Business Intelligence
Course Code	22MCA252
Course outcomes (COs) : At the end of the course the student will be able to:	
22MCA114.1	Analyze the concept of data warehouse, Business Intelligence and OLAP.
22MCA114.2	Demonstrate data pre-processing techniques and data mining primitives.
22MCA114.3	Association rule mining techniques and apriori algorithm.
22MCA114.4	Apply classification and prediction techniques for the given problem.
22MCA114.5	Analyze data mining for various business intelligence applications for the given problem.

Course Title	Cryptography and Network Security
Course Code	22MCA261
Course outcomes (COs) : At the end of the course the student will be able to:	
22MCA115.1	Analyze and design classical encryption techniques and block ciphers
22MCA115.2	Understand and analyze data encryption standard
22MCA115.3	Understand and analyze public-key cryptography, RSA and other public-key cryptosystems
22MCA115.4	Understand key management and distribution schemes and design User Authentication, such as Diffie-Hellman Key Exchange, ElGamal Cryptosystem
22MCA115.5	Analyze and design hash ,MAC algorithmsand digital signatures

Course Title	DBMS laboratory
Course Code	22MCAL27
Course outcomes (COs) : At the end of the course the student will be able to:	
22MCA116.1	Create database objects
22MCA116.2	Design entity relationship diagrams
22MCA116.3	Formulate SQL queries for a given problem

Course Title	Java Programming laboratory
Course Code	22MCAL28
Course outcomes (COs) : At the end of the course the student will be able to:	
22MCA117.1	Using java programming to develop programs for solving real-world problems.
22MCA117.2	Reinforcetheunderstandingofbasicobject-orientedprogrammingconcepts.