



# A J INSTITUTE OF ENGINEERING AND TECHNOLOGY

NH-66, Kottara Chowki, Mangaluru -575006, Karnataka, INDIA

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## Course Outcomes of First Year Courses

<b>Course Name: CALCULUS AND LINEAR ALGEBRA</b>	
<b>Course Code: 18MAT11</b>	
<b>Course Index: C101</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C101.1</b>	Apply the knowledge of calculus to solve problems related to polar curves and its applications in determining the bentness of a curve.
<b>C101.2</b>	Learn the notion of partial differentiation to calculate rates of change of multivariate functions and solve problems related to composite functions and Jacobians.
<b>C101.3</b>	Apply the concept of change of order of integration and variables to evaluate multiple integrals and their usage in computing the area and volumes.
<b>C101.4</b>	Solve first order linear/nonlinear differential equation analytically using standard methods
<b>C101.5</b>	Make use of matrix theory for solving system of linear equations and compute eigenvalues and eigenvectors required for matrix diagonalization process.
<b>Course Name: ENGINEERING PHYSICS</b>	
<b>Course Code: 18PHY12/22</b>	
<b>Course Index: C102</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C102.1</b>	Understand various types of oscillation and their implications, the role of shock waves in various field of engineering applications
<b>C102.2</b>	Recognize the elastic properties of materials and its importance in engineering applications
<b>C102.3</b>	Realize the inter relation between time varying electric field and magnetic field the transverse nature of EM waves and their role in optical fiber communication.

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C102.4	Compute the knowledge of Quantum Mechanics, Eigen values, Eigen function, momentum of atomic and sub atomic particles using time independent 1-D Schrodinger's wave equation. Apprehend theoretical background of laser, construction and working of different types of lasers and its application in different fields.
C102.5	Understand various electrical and thermal properties of materials such as conductors, semiconductors and dielectrics using different theoretical models.
<b>Course Name: Basic Electrical Engineering</b>	
<b>Course Code: 18ELE13/23</b>	
<b>Course Index: C103</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C103.1	To explain the laws used in the analysis of DC and AC circuits.
C103.2	To analyze single phase AC Circuits and to explain the generation of three-phase power and operation of three-phase circuits
C103.3	To explain the working principles of transformers and understand the concept of domestic wiring and the protective devices.
C103.4	To explain the construction, working principle and operation of DC generators and DC motors.
C103.5	To explain the construction, working principle and operation of induction motors, and synchronous generators
<b>Course Name: Elements of Civil Engineering and Mechanics</b>	
<b>Course Code: 18CIV14/24</b>	
<b>Course Index: C104</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C104.1	Mention the applications of various fields of Civil Engineering.
C104.2	Compute the resultant of given force system subjected to various loads.
C104.3	Analyze the action of Forces, Moments and other loads on systems of rigid bodies and compute the reactive forces that develop as a result of the external loads.

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C104.4	Locate the Centroid and compute the Moment of Inertia of regular and built-up sections.
C104.5	Illustrate the relationship between the motion of bodies and analyze the bodies in motion.
<b>Course Name: Engineering Graphics</b>	
<b>Course Code: 18EGDL15/25</b>	
<b>Course Index: C105</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C105.1	Understand the use of CAD software tool and produce computer generated drawings
C105.2	Use the knowledge of orthographic projections of points, lines & planes to represent the same in the form of drawings.
C105.3	Analyse orthographic projections of solids and represent the same in the form of drawings.
C105.4	Prepare development of lateral surfaces of solids and to convert orthographic views into Isometric drawing
<b>Course Name: Engineering Physics Laboratory</b>	
<b>Course Code: 18PHYL16/26</b>	
<b>Course Index: C106</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C106.1	Apprehend the concepts of interference of light, diffraction of light, Fermi energy and magnetic effect of current.
C106.2	Understand the principles of operations of optical fibres and semiconductor devices such as Photodiode, and NPN transistor using simple circuits.
C106.3	Determine elastic moduli and moment of inertia of given materials with the help of suggested procedures
C106.4	Recognize the resonance concepts and its practical applications
C106.5	Understand the importance of measurement procedure, honest recording and representing the data, reproduction of final results.

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<b>Course Name: Basic Electrical Engineering Laboratory</b>	
<b>Course Code: 18ELEL17/27</b>	
<b>Course Index: C107</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C107.1</b>	Understand the practical aspects of Kirchoff's voltage and current laws.
<b>C107.2</b>	Understand the two way and three way control of lamps, compare the power factor of lamps and theory behind the circuit faults such as short circuit and open circuit.
<b>C107.3</b>	Determine impedance and measure energy consumed in an electrical circuit.
<b>C107.4</b>	Understand the relation between line and phase quantities and also measure power consumed in a 3 phase system.
<b>C107.5</b>	Understand the importance of experimental procedure, honest recording and representing of data and reproduction of final results.
<b>Course Name: Technical English-1</b>	
<b>Course Code: 18EGHI8</b>	
<b>Course Index: C108</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C108.1</b>	Use grammatical English and essentials of language skills and identify the nuances of phonetics, intonation and flawless pronunciation.
<b>C108.2</b>	Implement English vocabulary at command and language proficiency.
<b>C108.3</b>	Identify common errors in spoken and written communication.
<b>C108.4</b>	Understand and improve the non verbal communication and kinesics.
<b>C108.5</b>	Perform well in campus recruitment, engineering and all other general competitive examinations.
<b>Course Name: ADVANCED CALCULUS AND NUMERICAL METHODS</b>	



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<b>Course Code: 18MAT21</b>	
<b>Course Index: C109</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C109.1</b>	Illustrate the applications of multivariate calculus to understand the solenoidal and irrotational vectors and also exhibit the inter dependence of line, surface and volume integrals.
<b>C109.2</b>	Demonstrate various physical models through higher order differential equations and solve such linear ordinary differential equations.
<b>C109.3</b>	Construct a variety of partial differential equations and solution by exact methods/method of separation of variables.
<b>C109.4</b>	Explain the applications of infinite series and obtain series solution of ordinary differential equations.
<b>C109.5</b>	Apply the knowledge of numerical methods in the modeling of various physical and engineering phenomena.
<b>Course Name: Engineering Chemistry</b>	
<b>Course Code: 18CHE12/22</b>	
<b>Course Index: C110</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C110.1</b>	Evaluate various electrochemical parameters and explain working principle of modern batteries & its applications
<b>C110.2</b>	Identify causes of different types of corrosion of metals and explain its consequences and prevention by various strategies like surface modification.
<b>C110.3</b>	Explain the quality of fuels and learning about alternative energy sources, working principles of fuel cells and solar cells.
<b>C110.4</b>	Explain various environmental issues, waste management and Analyzing water quality for various parameters.
<b>C110.5</b>	Explain the working principle of various instrumental techniques, synthesis and properties of nano-materials.

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<b>Course Name: C PROGRAMMING FOR PROBLEM SOLVING</b>	
<b>Course Code: 18CPS13/23</b>	
<b>Course Index: C111</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C111.1</b>	Define and interpret the basics of computer hardware, software and outline the structure of C program
<b>C111.2</b>	Understand the working of loops, conditional statements and solve simple computational problems.
<b>C111.3</b>	Organize and Make use of arrays to perform sorting and searching operations and analyze the implementation of string functions
<b>C111.4</b>	Demonstrate the solution for the given problem using functions and recursive functions
<b>C111.5</b>	Understand and apply structures and pointers to construct a programming solution in C programming language.
<b>Course Name: Basic Electronics</b>	
<b>Course Code: 18ELN14/24</b>	
<b>Course Index: C112</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C112.1</b>	Describe the operation of semiconductor diode and its applications.
<b>C112.2</b>	Describe the operation of FET
<b>C112.3</b>	Describe the operation of Operational amplifiers and its applications.
<b>C112.4</b>	Design and explain the construction of BJT amplifiers, regulators, 555 timer and oscillators
<b>C112.5</b>	Explain different number systems and construct simple combinational and sequential circuits.
<b>Course Name: Elements of Mechanical Engineering</b>	



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<b>Course Code: 18ME15/25</b>	
<b>Course Index: C113</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C113.1</b>	Identify different sources of energy and their conversion process.
<b>C113.2</b>	Explain the working principle of Boilers hydraulic turbines and pumps
<b>C113.3</b>	Explain the working principle of IC engines and refrigeration.
<b>C113.4</b>	Recognize various metal joining processes, power transmission elements, properties of common engineering materials and their applications in engineering industry.
<b>C113.5</b>	Discuss the working of conventional machine tools, machining processes, tools and advanced manufacturing systems
<b>Course Name: Engineering Chemistry laboratory</b>	
<b>Course Code: 18CHEL16/26</b>	
<b>Course Index: C114</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C114.1</b>	Learn to handle different types of instruments for analysis of materials using small quantities of materials involved for quick and accurate results.
<b>C114.2</b>	To carry out different types of titrations for estimation of concerned in materials using comparatively more quantities of materials involved for good results.
<b>Course Name: C Programming Laboratory</b>	
<b>Course Code: 18CPL17/27</b>	
<b>Course Index: C115</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C115.1</b>	Understand the basics of computer hardware and familiarize with programming environment that enables to develop a C program
<b>C115.2</b>	Design algorithms, flowcharts, programs for simple problems and identify and fix the syntax, logical errors to execute a program.

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C115.3	Apply conditional and looping statements and analyze the advantages of iterative and recursive programs.
C115.4	Analyze the role of searching and sorting techniques in problem solving
C115.5	Demonstrate how functions, arrays, strings, structures and pointers are used in problem solving.
<b>Course Name: Technical English-II</b>	
<b>Course Code: 18EGH28</b>	
<b>Course Index: C116</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C116.1	Identify the common errors in spoken and written communication.
C116.2	Get familiarized with English vocabulary and language proficiency.
C116.3	Improve nature and style of sensible writing and acquire employment and workplace communication skills.
C116.4	Improve their Technical Communication Skills through Technical Reading and Writing practices.
C116.5	Perform well in campus recruitment, engineering and all other general competitive examinations.

NBA Coordinator (First Year)

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## Course Outcomes of Civil Engineering Program

<b>Course Name: Transform Calculus, Fourier Series and Numerical Techniques</b>	
<b>Course Code: 18CV31</b>	
<b>Course Index: C201</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C201.1</b>	Use Laplace transform and inverse Laplace transform in solving differential/ integral equations arising in network analysis, control systems and other fields of engineering.
<b>C201.2</b>	Demonstrate Fourier series to study the behavior of periodic functions & their applications in system communications, digital signal processing & field theory.
<b>C201.3</b>	Make use of Fourier transform and Z-transform to illustrate discrete/continuous function arising in wave and heat propagation, signals and systems.
<b>C201.4</b>	Solve first and second order ordinary differential equations arising in engineering problems using single step and multistep numerical methods.
<b>C201.5</b>	Determine the external of functionals using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis.
<b>Course Name: Strength of Materials</b>	
<b>Course Code: 18CV32</b>	
<b>Course Index: C202</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C202.1</b>	To evaluate the basic concepts of the stresses and strains for different materials and strength of structural elements
<b>C202.2</b>	To evaluate the development of internal forces and resistance mechanism for one dimensional and two dimensional structural elements.

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C202.3	To analyze different internal forces and stresses induced due to representative loads on structural elements
C202.4	To evaluate slope and deflections of beams.
C202.5	To evaluate the behavior of torsion members, columns and struts
<b>Course Name: Fluid Mechanics</b>	
<b>Course Code: 18CV33</b>	
<b>Course Index: C203</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C203.1	After studying this topic student will possess a sound knowledge of fundamental properties of fluids and fluid continuum
C203.2	Students can compute and solve problems on hydrostatics, including practical applications
C203.3	Students can apply principles of mathematics to represent kinematic concepts related to fluid flow
C203.4	Students will apply fundamental laws of fluid mechanics and the Bernoulli's principle for practical applications
C203.5	Students can compute the discharge through pipes and over notches and weirs
<b>Course Name: Building Materials and Construction</b>	
<b>Course Code: 18CV34</b>	
<b>Course Index: C204</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	



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C204.1	Select suitable materials for buildings and adopt suitable construction techniques
C204.2	Decide suitable type of foundation based on the soil parameters
C204.3	Supervise the construction of building elements based on site suitability
C204.4	Design of staircase and selection of formworks suitable for construction
C204.5	Exhibit the knowledge of building finishes
<b>Course Name: Basic Surveying</b>	
<b>Course Code: 18CV35</b>	
<b>Course Index: C205</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C205.1	Posses a sound knowledge of fundamental principles Geodetics
C205.2	Measurement of vertical and horizontal plane, linear and angular dimensions to arrive at solutions to basic surveying problems.
C205.3	Capture geodetic data to process and perform analysis for survey problems
C205.4	Analyse the obtained spatial data and compute areas and volumes. Represent 3D data on plane figures as contours
<b>Course Name: Engineering Geology</b>	
<b>Course Code:18CV36</b>	
<b>Course Index:C206</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C206.1	Apply geological knowledge in different civil engineering practice



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C206.2	Students will acquire knowledge on durability and competence of foundation rocks, and confidence enough to use the best building materials.
C206.3	Civil Engineers are competent enough for the safety, stability, economy and life of the structures that they construct.
C206.4	Able to solve various issues related to ground water exploration, build up dams, bridges, tunnels which are often confronted with ground water problems
C206.5	Intelligent enough to apply GIS, GPS and remote sensing as a latest tool in different civil engineering construction.

**Course Name: Computer Aided Building Planning & Drawing**

**Course Code:18CVL37**

**Course Index:C207**

**Course Outcomes:** At the end of the course the student will be able to

C207.1	Prepare, read and interpret the drawings in a professional set up.
C207.2	Know the procedures of submission of drawings and Develop working and submission drawings for building.
C207.3	Plan and design a residential or public building as per the given requirements.

**Course Name: Building Materials Testing Laboratory**

**Course Code: 18CVL38**

**Course Index: C208**

**Course Outcomes:** At the end of the course the student will be able to

C208.1	Reproduce the basic knowledge of mathematics and engineering in finding the strength in tension, compression, shear and torsion.
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C208.2	Identify, formulate and solve engineering problems of structural elements subjected to flexure.
C208.3	Evaluate the impact of engineering solutions on the society and also will be aware of contemporary issues regarding failure of structures due to unsuitable materials.
<b>Course Name: Complex Analysis, Probability And Statistical Methods</b>	
<b>Course Code: 18MAT41</b>	
<b>Course Index: C210</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C210.1	Use the concepts of analytic function and complex potentials to solve the problems arising in electromagnetic field theory.
C210.2	Utilize conformal transformation and complex integral arising in aerofoil theory, fluid flow visualization and image processing.
C210.3	Apply discrete and continuous probability distributions in analyzing the probability models arising in engineering field.
C210.4	Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data.
C210.5	Construct joint probability distributions and demonstrate the validity of testing the hypothesis.
<b>Course Name: Analysis of Determinate Structures</b>	
<b>Course Code: 18CV42</b>	
<b>Course Index: C211</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C211.1	Identify different forms of structural systems.

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C211.2	Construct ILD and analyse the beams and trusses subjected to moving loads
C211.3	Understand the energy principles and energy theorems and its applications to determine the deflections of trusses and beams
C211.4	Determine the stress resultants in arches and cables.
<b>Course Name: Applied Hydraulics</b>	
<b>Course Code: 18CV43</b>	
<b>Course Index: C212</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C212.1	Apply dimensional analysis to develop mathematical modeling and compute the parametric values in prototype by analyzing the corresponding model parameters
C212.2	Design the open channels of various cross sections including economical channel sections
C212.3	Apply Energy concepts to flow in open channel sections, Calculate Energy dissipation
C212.4	Compute water surface profiles at different conditions
C212.5	Design turbines for the given data, and to know their operation characteristics under different operating conditions
<b>Course Name: Concrete Technology</b>	
<b>Course Code: 18CV44</b>	
<b>Course Index: C213</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C213.1	Identify the functional role of ingredients of concrete and apply this knowledge to Concrete mix design



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C213.2	Adopt suitable concreting methods to place the concrete based on requirement and to acquire the fundamental knowledge of properties of fresh concrete
C213.3	Evaluate the effect of the environment on service life performance, properties and failure modes of structural concrete and demonstrate techniques of measuring the Non Destructive Testing of concrete structure
C213.4	Illustrate proportioning of different types of concrete mixes for required fresh and hardened properties using professional codes
C213.5	Select a suitable type of concrete based on specific application.
<b>Course Name: Advanced Surveying</b>	
<b>Course Code: 18CV45</b>	
<b>Course Index: C214</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C214.1	Apply geometric principles to arrive at solutions to surveying problems.
C214.2	Use modern instruments to obtain geo-spatial data and analyses the same to appropriate engineering problems
C214.3	capture geodetic data to process and perform analysis for survey problems with the use of electronic instruments
C214.4	Design and implement the different types of curves for deviating type of alignments
C214.5	Learn Linear and Angular measurements to arrive at solutions to basic surveying problems
<b>Course Name: Water Supply &amp; Treatment Engineering</b>	
<b>Course Code: 18CV46</b>	
<b>Course Index: C215</b>	

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<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C215.1</b>	Estimate average & peak water demand for a community
<b>C215.2</b>	Evaluate available sources of water, quantitatively and qualitatively and make appropriate choice for a community.
<b>C215.3</b>	Evaluate water quality & environmental significance of various parameters & plan suitable treatment system.
<b>C215.4</b>	Design a comprehensive water treatment & removal of dangerous bacteria.
<b>C215.5</b>	Examine Distribution system to purify & distribute water to the required quality standards

**Course Name: Engineering Geology Laboratory**

**Course Code:18CVL47**

**Course Index: C216**

**Course Outcomes:** At the end of the course the student will be able to

<b>C216.1</b>	The students able to identify the minerals; rocks and utilize them effectively in civil engineering practices.
<b>C216.2</b>	The students will interpret and understand the geological conditions of the area for implementation of civil engineering projects.
<b>C216.3</b>	The students will interpret subsurface information such as thickness of soil, weathered zone, depth of hard rock and saturated zone by using geophysical methods.
<b>C216.4</b>	The students will learn the techniques in the interpretation of LANDSAT Imageries to find out the lineaments and other structural features for the given area.
<b>C216.5</b>	The students will be able to identify the different structures in the field.



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<b>Course Name: Fluid Mechanics and Hydraulic Machines Laboratory</b>	
<b>Course Code: 18CVL48</b>	
<b>Course Index: C217</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C217.1</b>	Properties of fluids and the use of various instruments for fluid flow measurement
<b>C217.2</b>	Working of hydraulic machines under various conditions of working and their characteristics
<b>Course Name: Constitution of India, Professional Ethics and Cyber Law</b>	
<b>Course Code: 18CPC49</b>	
<b>Course Index: C218</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C218.1</b>	Describe and analyze the role and salient features of Indian Constitution
<b>C218.2</b>	Understand the structure and powers of Union and State Executives.
<b>C218.3</b>	Relate to the procedures and provisions in the Electoral Process
<b>C218.4</b>	Develop Engineering & Professional ethics and adopt responsibilities expected of an Engineers.
<b>C218.5</b>	Identify the cybercrimes and describe the cyber laws for cyber safety measures.
<b>Course Name: Construction Management &amp; Entrepreneurship</b>	
<b>Course Code: 18CV51</b>	
<b>Course Index: C301</b>	



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<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C301.1</b>	Understand the construction management process
<b>C301.2</b>	Understand and solve variety of issues that are encountered by every professional in discharging professional duties
<b>C301.3</b>	Fulfill the professional obligations effectively with global outlook.
<b>C301.4</b>	Understand the concept of Economics
<b>C301.5</b>	Understand the Entrepreneurship Process

**Course Name: Analysis of Indeterminate Structures**

**Course Code: 18CV52**

**Course Index: C302**

**Course Outcomes:** At the end of the course the student will be able to

<b>C302.1</b>	Determine the moment in indeterminate beams and frames having variable moment of inertia and subsidence using slope deflection method
<b>C302.2</b>	Determine the moment in indeterminate beams and frames of no sway and sway using moment distribution method
<b>C302.3</b>	Construct the bending moment diagram for beams and frames by Kani's method.
<b>C302.4</b>	Construct the bending moment diagram for beams and frames using flexibility method
<b>C302.5</b>	Analyze the beams and indeterminate frames by system stiffness method

**Course Name: Design of RC Structural Elements**

**Course Code: 18CV53**

**Course Index: C303**



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<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C303.1</b>	Understand the design philosophy and principles
<b>C303.2</b>	Solve engineering problems of RC elements subjected to flexure, shear and torsion.
<b>C303.3</b>	Demonstrate the procedural knowledge in designs of RC structural elements such as beams owning professional and ethical responsibility
<b>C303.4</b>	Demonstrate the procedural knowledge in designs of RC structural elements such as slabs and stairs owning professional and ethical responsibility
<b>C303.5</b>	Demonstrate the procedural knowledge in designs of RC structural elements such as columns and footings owning professional and ethical responsibility
<b>Course Name: Basic Geotechnical Engineering</b>	
<b>Course Code: 18CV54</b>	
<b>Course Index: C304</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C304.1</b>	Will acquire an understanding of the procedures to determine index properties of any type of soil, classify the soil based on its index properties
<b>C304.2</b>	Will be able to determine compaction characteristics of soil and apply that knowledge to assess field compaction procedures
<b>C304.3</b>	Will be able to determine 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
<b>C304.4</b>	Will be able to estimate shear strength parameters of different types of soils using the data of different shear tests and comprehend Mohr-Coulomb failure theory
<b>C304.5</b>	Ability to solve practical problems related to estimation of consolidation settlement of soil deposits also time required for the same.

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<b>Course Name: Municipal Wastewater Engineering</b>	
<b>Course Code: 18CV55</b>	
<b>Course Index: C305</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C305.1</b>	Select the appropriate sewer appurtenances and materials in sewer network.
<b>C305.2</b>	Design the sewers network and understand the self purification process in flowing water.
<b>C305.3</b>	Deisgn the varies physic- chemical treatment units
<b>C305.4</b>	Design the various biological treatment units
<b>C305.5</b>	Design various AOPs and low cost treatment units.
<b>Course Name: Highway Engineering</b>	
<b>Course Code: 18CV56</b>	
<b>Course Index: C306</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C306.1</b>	Acquire the capability of proposing a new alignment or re-alignment of existing roads, conduct necessary field investigation for generation of required data.
<b>C306.2</b>	Evaluate the engineering properties of the materials and suggest the suitability of the same for pavement construction.
<b>C306.3</b>	Design road geometrics, structural components of pavement and drainage
<b>C306.4</b>	Evaluate the highway economics by few select methods and also will have a basic knowledge of various highway financing concepts.
<b>C306.5</b>	



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<b>Course Name: Surveying Practice</b>	
<b>Course Code: 18CVL57</b>	
<b>Course Index: C307</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C307.1</b>	Apply the basic principles of engineering surveying and for linear and angular measurements
<b>C307.2</b>	Comprehend effectively field procedures required for a professional surveyor
<b>C307.3</b>	Use techniques, skills and conventional surveying instruments necessary for engineering practice
<b>Course Name: Concrete and Highway Materials Laboratory</b>	
<b>Course Code: 18CVL58</b>	
<b>Course Index: 308</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C308.1</b>	Identification of minerals as mentioned in theory, their properties, uses and manufacturing of construction materials.
<b>C308.2</b>	Identification of rocks as mentioned in theory, their engineering properties and uses in construction and decorative purposes
<b>C308.3</b>	Dip and Strike problems: Determination of dip and strike direction in Civil Engineering projects (Railway lines, tunnels, dams, reservoirs) –graphical or any other method.
<b>C308.4</b>	Bore hole problems: Determination of subsurface behavior of rocks, their attitude related to foundation, tunnels, reservoirs and mining. Triangular and Square land, assuming ground is horizontal.

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C308.5	Calculation of Vertical, True thickness and width of the outcrops.
<b>Course Name: Environmental Studies</b>	
<b>Course Code: 18CIV59</b>	
<b>Course Index: C309</b>	
<b>Course Outcomes: At the end of the course the student will be able to</b>	
C309.1	Understand the principles of ecology and environmental issues that apply to air, land, and water issues on a global scale
C309.2	Develop critical thinking and/or observation skills, and apply them to the analysis of a problem or question related to the environment.
C309.3	Demonstrate ecology knowledge of a complex relationship between biotic and a biotic components.
C309.4	Apply their ecological knowledge to illustrate and graph a problem and describe the realities that managers face when dealing with complex issues.
<b>Course Name: Design of Steel Structural Elements</b>	
<b>Course Code: 18CV61</b>	
<b>Course Index: C310</b>	
<b>Course Outcomes: At the end of the course the student will be able to</b>	
C310.1	. Possess knowledge of Steel Structures Advantages and Disadvantages of Steel structures, steel code provisions and plastic behaviour of structural steel.



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C310.2	Understand the Concept of Bolted and Welded connections.members, simple slab base and gusseted base. 5. Understand the Concept of Design of laterally supported and un-supported steel beams.
C310.3	Understand the Concept of Design of compression members, built-up columns and columns splices.
C310.4	Understand the Concept of Design of tension simple slab base and gusseted base
C310.5	Understand the Concept of Design of laterally supported and un-supported steel beams.
<b>Course Name: Applied Geotechnical Engineering</b>	
<b>Course Code: 18CV62</b>	
<b>Course Index: C311</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C311.1	Ability to plan and execute geotechnical site investigation program for different civil engineering projects
C311.2	Understanding of stress distribution and resulting settlement beneath the loaded footings on sand and clayey soils
C311.3	Ability to estimate factor of safety against failure of slopes and to compute lateral pressure distribution behind earth retaining structures
C311.4	Ability to determine bearing capacity of soil and achieve proficiency in proportioning shallow isolated and combined footings for uniform bearing pressure
C311.5	Capable of estimating load carrying capacity of single and group of piles
<b>Course Name: Hydrology and Irrigation Engineering</b>	
<b>Course Code: 18CV63</b>	

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<b>Course Index: C312</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C312.1</b>	Measure precipitation and analyze the data inferring the importance of hydrology and its components
<b>C312.2</b>	Analyze the losses of precipitation
<b>C312.3</b>	Estimate runoff and develop unit hydrographs
<b>C312.4</b>	Find the benefits and ill-effects of irrigation, quantity of irrigation water and frequency of irrigation for various crops.
<b>C312.5</b>	Find the canal capacity, design the canal and compute the reservoir capacity
<b>Course Name: Solid Waste Managemen</b>	
<b>Course Code: 18CV642</b>	
<b>Course Index: C313</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C313.1</b>	Analyse existing solid waste management system and to identify their drawbacks.
<b>C313.2</b>	Evaluate different elements of solid waste management system.
<b>C313.3</b>	Suggest suitable scientific methods for solid waste management elements.
<b>C313.4</b>	Design suitable processing system and evaluate disposal sites.
<b>C313.5</b>	Evaluate landfill site and to study the sanitary landfill reactions.
<b>Course Name: Non convention energy and resources</b>	
<b>Course Code: 18ME651</b>	
<b>Course Index: C314</b>	



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<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C314.1</b>	Describe the environmental aspects of non-conventional energy resources in comparison with conventional energy systems and latest developments.
<b>C314.2</b>	Understand the fundamentals of solar radiation and its applications in heating, cooling, desalination, power generation, drying and cooking.
<b>C314.3</b>	Analyze the performance of solar flat plate collector using fundamentals of heat transfer.
<b>C314.4</b>	Explain the energy generation using wind, tidal and ocean thermal energy resources.
<b>C314.5</b>	Discuss the power generation from geothermal, biomass and hydrogen energy resources.
<b>Course Name: Software Application Laboratory</b>	
<b>Course Code: 18CVL66</b>	
<b>Course Index: C315</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C315.1</b>	Use software skills in a professional set up to automate the work and thereby reduce cycle time for completion of the work
<b>Course Name: Environmental Engineering Laboratory</b>	
<b>Course Code: 18CVL67</b>	
<b>Course Index: C316</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C316.1</b>	Acquire capability to conduct experiments and estimate the concentration of different parameters.
<b>C316.2</b>	Compare the result with standards and discuss based on the purpose of analysis



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C316.3	Determine type of treatment, degree of treatment for water and waste water
C316.4	Identify the parameter to be analyzed for the student project work in environmental stream
<b>Course Name: Extensive Survey project</b>	
<b>Course Code: 18CVEP68</b>	
<b>Course Index: C317</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C317.1	Apply Surveying knowledge and tools effectively for the projects
C317.2	Understanding Task environment, Goals, responsibilities, Task focus, working in Teams towards common goals, Organizational performance expectations, technical and behavioral competencies
C317.3	Application of individual effectiveness skills in team and organizational context, goal setting, time management, communication and presentation skills.
C317.4	Professional etiquettes at workplace, meeting and general, Establishing trust based relationships in teams & organizational environment
C317.5	Orientation towards conflicts in team and organizational environment, Understanding sources of conflicts, Conflict resolution styles and techniques
<b>Course Name: Quality Surveying and Contract Management</b>	
<b>Course Code: 18CV71</b>	
<b>Course Index: C401</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	



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C401.1	Taking out quantities and work out the cost and preparation of abstract for the estimated cost for various civil engineering works.
C401.2	Prepare detailed and abstract estimates for various road works, structural works and water supply and sanitary works.
C401.3	Prepare the specifications and analyze the rates for various items of work.
C401.4	Assess contract and tender documents for various construction works
C401.5	Prepare valuation reports of buildings.
<b>Course Name: Design of RCC and Steel Structures</b>	
<b>Course Code: 18CV72</b>	
<b>Course Index: C402</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C402.1	Students will acquire the basic knowledge in design of RCC and Steel Structures.
C402.2	Students will have the ability to follow design procedures as per codal provisions and skills to arrive at structurally safe RC and Steel members.
<b>Course Name: Ground Water Hydraulics</b>	
<b>Course Code: 18CV734</b>	
<b>Course Index: C403</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C403.1	Distinguish and assess the groundwater occurrence in various aquifer classifications
C403.2	Estimate the yield from aquifers by inferring its properties in different geological environments



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C403.3	Distinguish between steady state and transient groundwater flow processes and apply analytical solutions to solve existing flow problems
C403.4	Locate the zones of ground water resources
C403.5	Selection and design of suitable type of well and augment the ground water storage
<b>Course Name: Urban Transport Planning</b>	
<b>Course Code: 18CV745</b>	
<b>Course Index: C404</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C404.1	Design, conduct and administer surveys to provide the data required for transportation planning.
C404.2	Supervise the process of data collection about travel behavior and analyze the data for use in transport planning.
C404.3	Plan and design trip generated and trip distributed
C404.4	Develop and calibrate modal split, trip generation rates for specific types of land use developments.
C404.5	Adopt the steps that are necessary to complete a long-term transportation plan.
<b>Course Name: Energy and Environment</b>	
<b>Course Code: 18ME751</b>	
<b>Course Index: C405</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C405.1	Understand energy scenario, energy sources and their utilization.



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C405.2	Understand various methods of energy storage, energy management and economic analysis
C405.3	Analyse the awareness about environment and eco system
C405.4	Understand the environment pollution along with social issues and acts.
<b>Course Name: Geotechnical Engineering Laborator</b>	
<b>Course Code: 18CVL77</b>	
<b>Course Index: C407</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C407.1	Students will be able to conduct Physical and index properties of the soil
C407.2	Students will be able to Classify soil based on index properties and field identification
C407.3	Students will be able To determine OMC and MDD, plan and assess field compaction program
C407.4	Students will be able to determine the Shear strength and consolidation parameters to assess strength and deformation characteristics
C407.5	Students will be able to determine the In-situ shear strength characteristics of soil(SPT-Demonstration)
<b>Course Name: Project Work Phase - 1</b>	
<b>Course Code: 18CVP78</b>	
<b>Course Index: C408</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C408.1	Discover the potential research areas in the field of Civil Engineering



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C408.2	Compare several existing solutions for research challenge by conducting a survey on available literature
C408.3	Demonstrate an ability to work in teams with good communication
C408.4	Apply ethical principles in writing the technical report. Compose the innovative research findings to publish it for the benefit of the mankind
C408.5	To report and present the findings of the study conducted in the preferred domain
<b>Course Name: Design of Pre-stressed Concrete</b>	
<b>Course Code: 18CV81</b>	
<b>Course Index: C409</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C409.1	Understand the requirement of PSC members for present scenario.
C409.2	Analyse the stresses encountered in PSC element during transfer and at working.
C409.3	Understand the effectiveness of the design of PSC after studying losses
C409.4	Capable of analyzing the PSC element and finding its efficiency.
C409.5	Design PSC beam for different requirements.
<b>Course Name: Pavement Design</b>	
<b>Course Code: 18CV825</b>	
<b>Course Index: C410</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	



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C410.1	Systematically generate and compile required data for design of pavement (Highway & Airfield) and Analyze stress, strain and deflection by boussinesq's and burmister's theory.
C410.2	Design flexible pavement conforming to IRC37-2001
C410.3	Evaluate the performance of the flexible pavement and also maintenance measures of flexible pavement.
C410.4	Design rigid pavement conforming to IRC58-2002
C410.5	Evaluate the performance of the rigid pavement and also develops maintenance statement based on site specific requirements.
<b>Course Name: Project Work Phase - 2</b>	
<b>Course Code: 18CVP83</b>	
<b>Course Index: C411</b>	
<b>Course Outcomes: At the end of the course the student will be able to</b>	
C411.1	Discover the potential research areas in the field of Civil Engineering
C411.2	Compare several existing solutions for research challenge by conducting a survey on available literature
C411.3	Demonstrate an ability to work in teams with good communication
C411.4	Apply ethical principles in writing the technical report. Compose the innovative research findings to publish it for the benefit of the mankind
C411.5	To report and present the findings of the study conducted in the preferred domain
<b>Course Name: Technical Seminar</b>	
<b>Course Code: 18CVS84</b>	

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<b>Course Index: C412</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C412.1	To study research papers for understanding of a new field, in the absence of a textbook , to summarise and review them.
C412.2	To identify promising new directions of various cutting edge technologies
C412.3	To impart skills in preparing detailed report describing the project and results
C412.4	To effectively communicate by making an oral presentation before an evaluation committee
<b>Course Name: Internship</b>	
<b>Course Code: 18CVI85</b>	
<b>Course Index: C413</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C413.1	Demonstrate the application of knowledge and skill sets acquired from the course and workplace in the assigned job function/s
C413.2	Solve real life challenges in the workplace by analysing work environment and conditions, and selecting appropriate skill sets acquired from the course
C413.3	Communicate and collaborate effectively and appropriately with different professionals in the work environment through written and oral means;
C413.4	Exhibit critical thinking and problem solving skills by analysing underlying issue/s to challenges
C413.5	Demonstrate the ability to harness resources by analysing challenges and considering opportunities



NBA Coordinator

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*Suresh*

HOD-CV

H.O.D.-Civil Engineering  
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## Course Outcomes of Computer Science & Engineering Program

**Course Name:Engineering Mathematics - III**

**Course Code:18MAT31**

**Course Index:C201**

**Course Outcomes:** At the end of the course the student will be able to

**C201.1** Use Laplace transform and inverse Laplace transform in solving differential/ integral equation arising in network analysis, control systems and other fields of engineering.

**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** Make use of Fourier transform and Z-transform to illustrate discrete/continuous function arising in wave and heat propagation, signals and systems.

**C201.4** Solve first order ordinary differential equations arising in engineering problems using single step and multistep numerical methods.

**C201.5** Solve Second order ordinary differential equations arising in engineering problems using single step and multistep numerical methods Determine the extremals of functionals using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis.

**Course Name:Data Structures and applications**

**Course Code:18CS32**

**Course Index:C202**

**Course Outcomes:** At the end of the course the student will be able to

**C202.1** Explain different types of data structures and Apply searching & sorting algorithms on files

**C202.2** Identify the use of stacks and queues in problem solving

**C202.3** Understand the types of linked lists and illustrate various operations applied on it.

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C202.4	Interpret the role of trees to represent data sets and identify the applications and various operations of trees
C202.5	Understand graph operations and apply sorting, searching and hashing functions and interpret the use of files and their organization.
<b>Course Name:Analog And Digital Electronics</b>	
<b>Course Code:18CS33</b>	
<b>Course Index:C203</b>	
<b>Course Outcomes:</b> 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	Applying the Karnaugh Map, and Quine-McClusky Methods to simplify the digital circuits.
C203.4	Design different data processing circuits, registers and counters using the concepts of gates & flip flops.
C203.5	Develop simple Hardware Description Language using VHDL and Verilog programming.
<b>Course Name:Computer Organization</b>	
<b>Course Code:18CS34</b>	
<b>Course Index:C204</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C204.1	Explain the working of a computer system by using machine level instructions.
C204.2	Contrast and Choose appropriate interrupt hardware for communication with I/O devices.



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C204.3	Explain different types of memory architecture and Solve memory mapping strategies , replacement algorithm and its performance
C204.4	Discuss & Apply various arithmetic and logical operations on integer data by choosing appropriate algorithms
C204.5	Explain the processing unit, organization of processor and pipelining.
<b>Course Name:Software Engineering</b>	
<b>Course Code:18CS35</b>	
<b>Course Index:C205</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C205.1	Understand the activities involved in software engineering and Develop Software Requirement Specification document
C205.2	Explain the basics of object oriented concepts and build a suitable class model using modelling techniques
C205.3	Illustrate the role of various system models, and identify various design patterns and implementation issues related to the software
C205.4	Describe various software testing methods and the software evolution process and utilize the better testing technique for the project
C205.5	Illustrate the role of project planning and quality management in software development
<b>Course Name:Discrete Mathematical Structures</b>	
<b>Course Code:18CS36</b>	
<b>Course Index:C206</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	



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C206.1	Make use of propositional and predicate logic in knowledge representation and truth verification.
C206.2	Demonstrate the ability to solve problems using counting techniques and combinatorics in the context of discrete probability.
C206.3	Solve problems using relations, recurrence relations and functions
C206.4	Apply different mathematical proofs, techniques in proving theorems
C206.5	Compare graphs, trees, and their applications.

**Course Name: Analog And Digital Electronics Laboratory**

**Course Code: 18CSL37**

**Course Index: C207**

**Course Outcomes:** At the end of the course the student will be able to

C207.1	Use appropriate design equations / methods to design the given circuit.
C207.2	Examine and verify the design of analog circuits using simulators.
C207.3	Examine and verify the design of digital circuits using simulators.
C207.4	Make us of electronic components, ICs, instruments and tools for design and testing of circuits for the given the appropriate inputs.
C207.5	Compile a laboratory journal which includes; aim, tool/instruments/software/components used, design equations used and designs, schematics, program listing, procedure followed, relevant theory, results as graphs and tables, interpreting and concluding the findings.

**Course Name: Data Structures Laboratory**

**Course Code: 18CSL38**

**Course Index: C208**



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<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C209.1</b>	Analyze and Compare various linear and non-linear data structures
<b>C209.2</b>	Code, debug and demonstrate the working nature of different types of data structures and their Applications.
<b>C209.3</b>	Design and develop the applications of linked lists operations using suitable programs.
<b>C209.4</b>	Implement, analyze and evaluate the searching and sorting algorithms.
<b>C209.5</b>	Choose the appropriate data structure for solving real world problems.
<b>Course Name:Engineering Maths-IV</b>	
<b>Course Code:18MAT41</b>	
<b>Course Index:C211</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C211.1</b>	Use the concepts of analytic function and complex potentials to solve the problems arising in electromagnetic field theory.
<b>C211.2</b>	Utilize conformal transformation and complex integral arising in aerofoil theory, fluid flow visualization and image processing.
<b>C211.3</b>	Apply discrete and continuous probability distributions in analyzing the probability models arising in engineering field.
<b>C211.4</b>	Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data.
<b>C211.5</b>	Construct joint probability distributions and demonstrate the validity of testing the hypothesis. Markov chains in attempting engineering problems for feasible random events.
<b>Course Name:Design and Anlysis of Algorithms</b>	



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<b>Course Code:18CS42</b>	
<b>Course Index:C212</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C212.1</b>	Describe computational solution to well known problems like searching, sorting
<b>C212.2</b>	Illustrate the computational complexity of different algorithms.
<b>C212.3</b>	Devise an algorithm using appropriate design strategies for problem solving.
<b>C212.4</b>	Demonstrate various computational problem solving techniques for classic cases.
<b>C212.5</b>	Apply appropriate methods to solve a problem selecting suitable computational techniques
<b>Course Name:Operating Systems</b>	
<b>Course Code:18CS43</b>	
<b>Course Index:C213</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C213.1</b>	Explain the fundamentals of OS and process management concepts.
<b>C213.2</b>	Apply suitable technique for process scheduling and understand the concept of synchronization
<b>C213.3</b>	Discuss and apply methods for handling deadlocks and memory management strategies.
<b>C213.4</b>	Explain the concept of virtual memory management and file systems.
<b>C213.5</b>	Understand the concepts of secondary storage structures and Linux OS using case studies.
<b>Course Name:Microcontroller And Embedded Systems</b>	
<b>Course Code:18CS44</b>	
<b>Course Index:C214</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	



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C214.1	Students must be able to describe the architectural features and instructions of ARM microcontroller
C214.2	Students must be able to apply the knowledge gained for Programming ARM for different applications and Interface external devices & I/O with ARM microcontroller
C214.3	Students must be able to interpret the basic hardware components and their selection method based on the characteristics and attributes of an embedded system
C214.4	Students must be able to develop the hardware/software co-design and firmware design approaches
C214.5	Students must be able to demonstrate the need of real time operating system for embedded system applications

**Course Name: Object Oriented Concepts**

**Course Code: 18CS45**

**Course Index: C215**

**Course Outcomes:** At the end of the course the student will be able to

C215.1	Explain and apply the object-oriented concepts for solving simple problems using C++ features.
C215.2	Understand the JAVA Buzzwords and apply Object Oriented constructs and semantics for a given simple problem
C215.3	Analyze and apply inheritance, packages, exception handling and interface in JAVA language and develop simple programs of JAVA for corresponding problem statement.
C215.4	Understand the usage of packages and develop a multi-threaded application for a given problem statement.
C215.5	Develop simple GUI interfaces for a computer program to interact with users, and to understand the event-based GUI handling principles using swings components and applet.

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<b>Course Name:Data Communication</b>	
<b>Course Code:18CS46</b>	
<b>Course Index:C216</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C216.1</b>	Identify the basic concept of data communication, networks, internet, protocols suits OSI model, TCP/IP model and Digital Transmission.
<b>C216.2</b>	Identify the elements involved in analog transmission, Bandwidth Utilization and Switching.
<b>C216.3</b>	Demonstrate the use of error detection and correction codes on the data link layer protocols
<b>C216.4</b>	Experiment with different Media access control mechanisms and Ethernet standard used in wired and wireless LANs.
<b>C216.5</b>	Utilize the different network layer Protocols, understand the Transition strategies from IPV4 to IPV6.
<b>Course Name:Design and Anlaysis of Algorithms Laboratory</b>	
<b>Course Code:18CSL47</b>	
<b>Course Index:C217</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C217.1</b>	Design algorithms using appropriate design techniques(brute-force, greedy, dynamic programming, etc.)
<b>C217.2</b>	Implement a variety of algorithms such as sorting, graph related, combinatorial, etc., in a high level language.
<b>C217.3</b>	Analyze and compare the performance of algorithms using language features.



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C217.4	Apply and implement learned algorithm design techniques and data structures to solve real-world problems.
C217.5	Understand the OO methodologies and object relationship and their interaction
<b>Course Name:Microcontroller And Embedded Systems Laboratory</b>	
<b>Course Code:18CSL48</b>	
<b>Course Index:C218</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C218.1	Understand 80x86 instruction sets and gains the knowledge of how assembly language works
C218.2	Develop and test program using ARM7TDMI/LPC2148
C218.3	Understand ARM7TDMI/LPC2148 evaluation board using evaluation version of Embedded 'C'
C218.4	Understand ARM7TDMI/LPC2148 evaluation board using Keil Uvision-4 tool/compiler
C218.5	Understand processors for various kinds of applications.
<b>Course Name:MANAGEMENT AND ENTREPRENEURSHIP FOR IT INDUSTRY</b>	
<b>Course Code:18CS51</b>	
<b>Course Index:C301</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C301.1	Describe the basic principles and concepts of managements. Determine the various plans and list the steps in planning.



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C301.2	Interpret the concepts of directing and controlling.
C301.3	Demonstrate the meaning, functions, types and roles of an entrepreneur.
C301.4	Designing the project report. Understanding the importance of ERP.
C301.5	Explain in detail about micro and small scale industries. Make use of IPRs and institutional support in entrepreneurship.
<b>Course Name:Computer Networks and Security</b>	
<b>Course Code:18CS52</b>	
<b>Course Index:C302</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C302.1	Understand the principles of application layer protocol create network application and implement socket programming.
C302.2	Infer UDP and TCP protocols in transport layer, identify causes for congestion and outline the congestion control mechanism.
C302.3	Understand the router architecture, classify IP and implement routing algorithms in network layer.
C302.4	Determine the Wireless and Mobile Networks covering IEEE 802.11 Standard and Illustrate mobility management in cellular networks
C302.5	Describe Multimedia Networking, explain the challenges to design real time applications and apply the techniques to overcome from the challenges faced.
<b>Course Name:Database Management System</b>	
<b>Course Code:18CS53</b>	
<b>Course Index:C303</b>	

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<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C303.1</b>	Identify an information storage problem and derive an information model expressed in the form of an entity relation diagram.
<b>C303.2</b>	Construct a physical design for a database from its logical design by using relational algebra and SQL.
<b>C303.3</b>	Develop a database application system and use advanced SQL tools using an SQL interface and JDBC.
<b>C303.4</b>	Apply normalization techniques in real-life Database Applications.
<b>C303.5</b>	Apply techniques for controlling the consequences of concurrent data access and database recovery.
<b>Course Name: Automata Theory And Computability</b>	
<b>Course Code: 18CS54</b>	
<b>Course Index: C304</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C304.1</b>	Apply the skill of Theory of computation to design & simulate Finite State Machine for a given regular languages
<b>C304.2</b>	Apply the properties of Regular Languages to design regular expressions and regular grammar.
<b>C304.3</b>	Utilize skill of CFG to Design and Construct CFG and PDA for Context Free Languages
<b>C304.4</b>	Acquire the skill on types formal model of decidable problems to design and develop a computing model for Context Sensitive and Semi-Decidable Languages
<b>C304.5</b>	Acquire the skills of Computing Machine to classify a problem with respect to different models of computation
<b>Course Name: Application Development Using Python</b>	

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<b>Course Code:18CS55</b>	
<b>Course Index:C305</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C305.1</b>	Understand and implement the basic programming constructs with flow control statement, functions and Exception handling.
<b>C305.2</b>	Understand and implement the core data structures in python such as List, Tuples, Strings and Dictionaries.
<b>C305.3</b>	Understand and demonstrate pattern matching with RE, file system and debugging.
<b>C305.4</b>	Interpret and apply OOP's the concepts such as classes and objects, class and methods, classes and functions and Inheritance in Python
<b>C305.5</b>	Understand and implement process of web scraping, working with Excel spread sheets, PDF, Word, CSV, JSON file formats.
<b>Course Name:Unix Programming</b>	
<b>Course Code:18CS56</b>	
<b>Course Index:C306</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C306.1</b>	Explain Unix Architecture, File system and the use of Basic Commands
<b>C306.2</b>	Illustrate Shell Programming and to write Shell Scripts
<b>C306.3</b>	Categorize, compare and make use of Unix System Calls
<b>C306.4</b>	Interpret the use of various IPC methods and shared memory techniques
<b>C306.5</b>	Understand the application concepts of signals and daemon process
<b>Course Name:Computer Networks Laboratory</b>	
<b>Course Code:18CSL57</b>	



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<b>Course Index:C307</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C307.1</b>	Analyze and implement various networking protocols using NS2/NS3.
<b>C307.2</b>	Implement, analyze and evaluate Ping messages and Ethernet LAN using NS2/NS3
<b>C307.3</b>	Implement, analyze and evaluate performance of ESS, GSM and CDMA using NS2/NS3
<b>C307.4</b>	Design and Develop cryptography & network security algorithm, routing algorithm and congestion control algorithm to provide the security for various layers of ISO/OSI
<b>C307.5</b>	Implement socket programming to show the working of transport layer protocols.
<b>Course Name:DBMS Laboratory With Mini Project</b>	
<b>Course Code:18CSL58</b>	
<b>Course Index:C308</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C308.1</b>	Design conceptual models of a database using schema and ER modeling.
<b>C308.2</b>	Construct and query the database using SQL DDL/DML Commands and enforce integrity constraints using state-of-art RDBMS.
<b>C308.3</b>	Apply the concept of embedded and nested queries and create stored procedure and triggers to meet the desired needs.
<b>C308.4</b>	Apply the concepts of normalization to design an optimal database.
<b>C308.5</b>	Develop a database application system using advanced SQL tools and interfaces with appropriate documentation by incorporating ethical standards.
<b>Course Name:Environmental Studies</b>	
<b>Course Code:18CIV59</b>	

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<b>Course Index:C309</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C309.1</b>	To understand different component of environment and their function.
<b>C309.2</b>	To acquire solutions for global issues with advanced approaches
<b>C309.3</b>	To Understand the principles and solutions of environmental issues that apply to air, land, water and waste management
<b>C309.4</b>	To Understand the issues on Global environmental concerns with observations.
<b>C309.5</b>	To learn and apply the techniques of assessing environmental impacts through a multidisciplinary approach with various tools
<b>Course Name: System Software And Compilers</b>	
<b>Course Code: 18CS61</b>	
<b>Course Index: C310</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C310.1</b>	Apply and Understand SIC/SIC-XE assembler translation process to convert a given source program to Machine language program.
<b>C310.2</b>	Discuss the features of various types of loaders and Apply the loader operation to a given program.
<b>C310.3</b>	Understand and Design the process of lexical analysis.
<b>C310.4</b>	Explain the different types of parsers and Apply the Parser process for a given source string and respective grammar
<b>C310.5</b>	Understand SDD and SDT, Apply the operations of intermediate code generation phase, code generation phase, and code optimization phase to a given example source code



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<b>Course Name:Computer Graphics and Visualization</b>	
<b>Course Code:18CS62</b>	
<b>Course Index:C311</b>	
<b>Course Outcomes: At the end of the course the student will be able to</b>	
<b>C311.1</b>	Design and implement algorithms for 2D graphics primitives and attributes.
<b>C311.2</b>	Illustrate Geometric transformations on both 2D and 3D objects
<b>C311.3</b>	Apply concepts of clipping and visible surface detection in 2D and 3D viewing, and Illumination Models
<b>C311.4</b>	Decide suitable hardware and software for developing graphics packages using OpenGL.
<b>Course Name:Web Technology And its applications</b>	
<b>Course Code:18CS63</b>	
<b>Course Index:C312</b>	
<b>Course Outcomes: At the end of the course the student will be able to</b>	
<b>C312.1</b>	Adapt HTML and CSS syntax and semantics to build web pages
<b>C312.2</b>	Construct and visually format tables and forms using HTML and CSS
<b>C312.3</b>	Develop Client-Side Scripts using JavaScript and Server-Side Scripts using PHP to generate and display the contents dynamically
<b>C312.4</b>	Appraise the principles of object oriented development using PHP
<b>C312.5</b>	Inspect JavaScript frameworks like jQuery and Backbone which facilitates developer to focus on core features
<b>Course Name:Data Mining And Data Warehousing</b>	
<b>Course Code:18CS641</b>	
<b>Course Index:C313</b>	

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<b>Course Outcomes:</b> At the end of the course the student will be able to	
C313.1	Understand and Design data warehouse with dimensional modeling and apply OLAP operations.
C313.2	Understand the fundamental Data Mining tasks and Measures of Similarity and Dissimilarity
C313.3	Write Association rules for a given data pattern
C313.4	Understand and apply various classification algorithms for given dataset
C313.5	Compare different approaches of cluster analysis

**Course Name: NON CONVENTIONAL ENERGY SOURCES**

**Course Code: 18ME651**

**Course Index: C314**

**Course Outcomes:** At the end of the course the student will be able to

C314.1	Describe the environmental aspects of non-conventional energy resources in comparison with conventional energy systems and latest developments.
C314.2	Understand the fundamentals of solar radiation and its applications in heating, cooling, desalination, power generation, drying and cooking.
C314.3	Analyze the performance of solar flat plate collector using fundamentals of heat transfer.
C314.4	Explain the energy generation using wind, tidal and ocean thermal energy resources.
C314.5	Discuss the power generation from geothermal, biomass and hydrogen energy resources.

**Course Name: System Software Laboratory**

**Course Code: 18CSL66**

**Course Index: C315**

**Course Outcomes:** At the end of the course the student will be able to



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C315.1	Utilize the skill of Regular expression for implementing and demonstrating a Lexical analysis and Syntax analysis phases of compiler
C315.2	Utilize the skill of CFG for implementing and demonstrating a machine code generation for the given intermediate code.
C315.3	Apply the knowledge on operating system to implement and demonstrate different process scheduling algorithms
C315.4	Apply the skill of memory management to implement and demonstrate memory allocation (Page replacement) algorithms
<b>Course Name:Computer Graphics Laboratory With Mini Project</b>	
<b>Course Code:18CSL67</b>	
<b>Course Index:C316</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C316.1	Construct 2D and 3D shapes using basic graphic primitives and animating the same using OpenGL
C316.2	Apply line drawing ,clipping and curve generating algorithms using OpenGL functions
C316.3	Create the objects by adding lighting and shading effects
C316.4	Develop objects that includes user interaction using input device functions (like keyboard and mouse ) for transforming the object
C316.5	Develop a graphical model using the concepts learnt in theory and lab exercises.
<b>Course Name:Mobile Application Development Lab</b>	
<b>Course Code:18CSMP68</b>	
<b>Course Index:C317</b>	

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<b>Course Outcomes:</b> 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
<b>Course Name:Artificial Intelligence and Machine Learning</b>	
<b>Course Code:18CS71</b>	
<b>Course Index:C401</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C401.1	Appraise the theory of Artificial intelligence and Machine Learning.
C401.2	Illustrate the working of AI and ML Algorithms.
C401.3	Demonstrate the applications of AI and ML.
<b>Course Name:Big Data Analytics</b>	
<b>Course Code:18CS72</b>	
<b>Course Index:C402</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C402.1	Understand fundamentals of Big Data analytics
C402.2	Investigate Hadoop framework and Hadoop Distributed File system



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C402.3	Illustrate the concepts of NoSQL using MongoDB and Cassandra for Big Data
C402.4	Demonstrate the MapReduce programming model to process the big data along with Hadoop tools
C402.5	Use Machine Learning algorithms for real world big data, Analyse web contents and Social Networks to provide analytics with relevant visualization tools.
<b>Course Name:Software Architecture and Design Patterns</b>	
<b>Course Code:18CS731</b>	
<b>Course Index:C403</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C403.1	Understand the basic concepts of software architecture design pattern and demonstrate the patterns related to object-oriented development
C403.2	Identify and apply the appropriate structural patterns for design of given problem.
C403.3	Analyze the use of various behavioral patterns to improve the quality of design of solution to a given problem
C403.4	Understand the core design principles used in MVC architecture and to implement the interactive systems
C403.5	Select and apply patterns in a given specific contexts and explain distributed system, Java RMI.
<b>Course Name:Network management</b>	
<b>Course Code:18CS742</b>	
<b>Course Index:C404</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	



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C404.1	Analyze the issues and challenges pertaining to telecommunications, data communications, and network management and describe how network components and networks are managed by network management systems.
C404.2	Apply network management standards, models, and language needed to delve into the study of network management.
C404.3	Understand basic functions of SNMPv1: organization, information, communication and functional models, and educated enhancements in SNMPv2 over that of SNMPv1.
C404.4	Describe three emerging technologies of broadband access networks: hybrid fiber coaxial cable (HFC)/cable modem technology, digital subscriber line (DSL) technology, and wireless technology.
C404.5	Formulate possible approaches for managing OSI application functions, namely configuration, fault, performance, security, and accounting.

<b>Course Name:ENERGY AND ENVIRONMENT</b>	
<b>Course Code:18ME751</b>	
<b>Course Index:C405</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C405.1	Summarize the basic concepts of energy,its distribution and general scenario
C405.2	Explain different energy storage systems ,energy management, audit and economic analysis
C405.3	Summarize the environment eco system and its need for awareness
C405.4	Identify the various types of environment pollution and their effects
C405.5	Discuss the Social issues of the environment with associated acts
<b>Course Name:Artificial Intelligence and Machine Learning Laboratory</b>	
<b>Course Code:18CSL76</b>	
<b>Course Index:C406</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	



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C406.1	Understand the implementation procedures for the Artificial Intelligence algorithms.
C406.2	Understand the implementation procedures for the machine learning algorithms.
C406.3	Design Python programs for various Learning algorithms.
C406.4	Apply appropriate data sets to the Machine Learning algorithms.
C406.5	Identify and apply Machine Learning algorithms to solve real world problems
<b>Course Name:Project Work Phase -1</b>	
<b>Course Code:18CSP77</b>	
<b>Course Index:C407</b>	
<b>Course Outcomes:</b> 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
C407.3	Incorporate the social, environmental and ethical issues effectively into solution of an engineering problem
C407.4	Contribute effectively as a team member or leader to manage the project timeline and make effective project Presentations
C407.5	Write pertinent project reports and take part in present / publishing the finding in a reputed conference / publications
<b>Course Name:Internet of Things</b>	
<b>Course Code:18CS81</b>	
<b>Course Index:C408</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C408.1	Interpret the impact and challenges posed by IoT networks leading to new architectural models
C408.2	Compare and contrast the deployment of smart objects and the technologies to connect them to network.



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C408.3	Appraise the role of IoT protocols for efficient network communication
C408.4	Elaborate the need for Data Analytics and Security in IoT.
C408.5	Illustrate different sensor technologies for sensing real world entities and identify the applications of IoT in Industry.
<b>Course Name:Storage Area Networks</b>	
<b>Course Code:18CS822</b>	
<b>Course Index:C409</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C409.1	Identify key challenges in managing information and analyze different storage networking technologies and virtualization
C409.2	Explain components and the implementation of NAS
C409.3	Describe CAS architecture and types of archives and forms of virtualization
C409.4	Illustrate the storage infrastructure and management activities
<b>Course Name:Project Work Phase -2</b>	
<b>Course Code:18CSP83</b>	
<b>Course Index:410B</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C410.1	Apply identified knowledge to solve a complex engineering problem and design a solution, implement and test the proposed solution
C410.2	Incorporate the social, environmental and ethical issues effectively into solution of an engineering problem
C410.3	Contribute effectively as a team member or leader to manage the project timeline
C410.4	Use synthesis/modelling to simulate and solve a problem or apply appropriate method of analysis to draw valid conclusions and present, demonstrate, execute final version of project
C410.5	Compile the report and take part in present / publishing the finding in a reputed conference / publications and make effective presentation



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<b>Course Name:Technical Seminar</b>	
<b>Course Code:18CSS84</b>	
<b>Course Index:C411</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C411.1</b>	Identify and study the technological development in the respective domain through literature survey
<b>C411.2</b>	Perform thorough analysis of the work performed by the experts in the field and draw conclusions
<b>C411.3</b>	Prepare a clear, coherent and succinct seminar report
<b>C411.4</b>	Present and defend the study with the stakeholders
<b>Course Name:Internship</b>	
<b>Course Code:18CSI85</b>	
<b>Course Index:412</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C412.1</b>	Apply engineering knowledge and management principles to design the solution for the given problem statement
<b>C412.2</b>	Apply knowledge and skills relevant to their field through the interaction with their group members.
<b>C412.3</b>	Analyze the application and modern tools to improve the efficiency of the challenges present in project.
<b>C412.4</b>	Understand the practice of professional ethics and responsibilities.
<b>C410.5</b>	understand multidisciplinary functions as a individual member

  
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## Course Outcomes of Electronics & Communication Engineering Program

**Course Name: Engineering Mathematics - III**

**Course Code: 18MAT31**

**Course Outcomes:** At the end of the course the student will be able to

C201.1	Use Laplace transform and inverse Laplace transform in solving differential/ integral equations arising in network analysis, control systems and other fields of engineering.
C201.2	Demonstrate Fourier series to study the behavior of periodic functions & their applications in system communications, digital signal processing & field theory.
C201.3	Make use of Fourier transform and Z-transform to illustrate discrete/continuous function arising in wave and heat propagation, signals and systems.
C201.4	Solve first and second order ordinary differential equations arising in engineering problems using single step and multistep numerical methods.
C201.5	Determine the external of functionals using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis.

**Course Name: Network Theory**

**Course Code: 18MAT32**

**Course Outcomes:** At the end of the course the student will be able to

C202.1	Determine currents and voltages using source transformation/ source shifting/ mesh/ nodal analysis and reduce given network using star-delta transformation/source transformation/ source shifting
C202.2	Solve network problems by applying Superposition/ Reciprocity/ Thevenin's/ Norton's/ Maximum Power Transfer/ Millman's Network Theorems and electrical laws to reduce circuit complexities and to arrive at feasible solutions



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C202.3	Evaluate first and second derivatives current and voltages for the given circuit under transient conditions.
C202.4	Apply Laplace transform to solve the given network.
C202.5	Solve the given network using specified two port network parameter like Z or Y or T or h. Understand the concept of resonance.

**Course Name: Electronic Devices**

**Course Code: 18EC33**

**Course Outcomes:** At the end of the course the student will be able to

C203.1	Explain the principles of semiconductor Physics
C203.2	Understand the principles and characteristics of different types of diodes and optoelectronic devices
C203.3	Understand the constructional details, the principle of operation and characteristics of BJTs and FETs
C203.4	Explain the fabrication process of semiconductor devices.
C203.5	Utilize the mathematical models of semiconductor junctions and MOS transistors for circuits and systems.

**Course Name: Digital System Design**

**Course Code: 18EC34**

**Course Outcomes:** At the end of the course the student will be able to

C204.1	Develop simplified Algebraic equation of combinational logic using Karnaugh Maps and Quine- McClusky techniques
C204.2	Design and analyze various combinational logic circuits

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C204.3	Design and analyze Counters, Shift registers using Flip Flops
C204.4	Develop Mealy/Moore Models and state diagrams for the given clocked sequential circuits.
C204.5	Design applications of Combinational & Sequential Circuits.
<b>Course Name: Computer organization &amp; architecture</b>	
<b>Course Code: 18EC35</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C205.1	Explain the basic organization of a computer system.
C205.2	Illustrate the concept of programs as sequences of machine instructions.
C205.3	Explain different ways of accessing an input / output device including interrupts
C205.4	Illustrate the organization of different types of semiconductor and other secondary storage memories.
C205.5	Illustrate simple processor organization based on hardwired control and micro programmed control.
<b>Course Name: Power Electronics and Instrumentation</b>	
<b>Course Code: 18EC36</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C206.1	Build and test circuits using power electronic devices
C206.2	Analyze and design controlled rectifier, DC to DC converters, DC to AC converters and SMPS
C206.3	Define instrument errors and its different types.



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C206.4	Develop circuits for multirange Ammeters, Voltmeters and Bridges to measure passive component values and frequency.
C206.5	Describe the principle of operation of Digital instruments and PLCs & Instrumentation amplifier
<b>Course Name: Electronic Devices and Instrumentation Lab</b>	
<b>Course Code: 18ECL37</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C207.1	Understand the characteristics of various electronic devices and measurement of parameters.
C207.2	Design and test various clipping and clamping circuits.
C207.3	Design and test half-wave rectifier and full wave rectifier with and without filter and controlled rectifiers using RC triggering circuit.
C207.4	Design a circuit to measure resistance using Wheatstone and Kelvin's bridge and temperature using a temperature sensor bridge.
C207.5	Use circuit simulation software for the implementation and characterization of electronic circuit and devices.
<b>Course Name: Digital System Design Lab</b>	
<b>Course Code: 18ECL38</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C208.1	Design, realize and verify De Morgan's Theorem,SOP,POS forms
C208.2	Demonstart the Truth Table of Various expressions and combinational circuits using logic gates



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C208.3	Design various combinational circuits such as adders, subtractors, comparators, multiplexers and demultiplexers
C208.4	Construct flips-flops, counters and shift registers
C208.5	Simulate serial adders and Binary Multiplier

**Course Name: Engineering Maths-IV**

**Course Code: 18MAT41**

**Course Outcomes:** At the end of the course the student will be able to

C210.1	Use the concepts of analytic function and complex potentials to solve the problems arising in electromagnetic field theory.
C210.2	Utilize conformal transformation and complex integral arising in aerofoil theory, fluid flow visualization and image processing.
C210.3	Apply discrete and continuous probability distributions in analyzing the probability models arising in engineering field.
C210.4	Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data.
C210.5	Construct joint probability distributions and demonstrate the validity of testing the hypothesis.

**Course Name: Analog Circuits**

**Course Code: 18EC42**

**Course Outcomes:** At the end of the course the student will be able to

C211.1	Understand the characteristics of BJTs and FETs.
C211.2	Design and analyze BJT and FET amplifier circuits
C211.3	Design sinusoidal and non-sinusoidal oscillators.



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C211.4	Understand the functioning of linear ICs.
C211.5	Design of Linear IC based circuits.
<b>Course Name: Control systems</b>	
<b>Course Code: 18EC43</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C212.1	Develop the mathematical model of mechanical and electrical systems
C212.2	Develop transfer function for a given control system using block diagram reduction techniques and signal flow graph method
C212.3	Determine the time domain specifications for first and second order systems
C212.4	Determine the stability of a system in the time domain using Routh-Hurwitz criterion and Root-locus technique
C212.5	Determine the stability of a system in the frequency domain using Nyquist and bode plots. Determine solution for state equations
<b>Course Name: Engineering Statistics and Linear Algebra</b>	
<b>Course Code: 18EC44</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C213.1	Understand the meaning of Single Random Variables and analyse mathematically its quantitative parameters.
C213.2	Understand the meaning of Multiple Random Variables and analyse mathematically its quantitative parameters.



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C213.3	Extension of random variable concept to Random Processes and Associate these concepts with examples that involve Transmission.
C213.4	Familiarization with the concept of Vector Spaces, orthogonality and Linear Transformations.
C213.5	Compute and simulate the quantitative parameters for Matrices.
<b>Course Name: Signals &amp; Systems</b>	
<b>Course Code: 18EC45</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C214.1	Define and Analyse different types of signals and systems.
C214.2	Determine linearity, memory, causality, time-invariance and stability properties of both continuous time and discrete time systems.
C214.3	Evaluate the convolution sum and convolution integral
C214.4	Represent continuous time periodic and non-periodic signals and systems in frequency domain using Fourier Representations (FS and FT).
C214.5	Represent discrete time periodic and non-periodic signals and systems in frequency domain using Fourier and Z-transforms.
<b>Course Name: Microcontroller</b>	
<b>Course Code: 18EC46</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C215.1	Describe the architecture of 8051 Microcontroller and, Interface 8051 to external memory.
C215.2	Describe Instruction set of 8051 and to write 8051 Assembly level programs using 8051 instruction set.

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C215.3	Understand the operation of Interrupt system, and Timers/Counters
C215.4	Write 8051 Assembly language programs and C Program to send & receive serial data using 8051 serial port.
C215.5	Interface simple switches, simple LEDs, ADC 0804, LCD and Stepper Motor to 8051 using 8051 I/O ports.
<b>Course Name: Microcontroller Laboratory</b>	
<b>Course Code: 18ECL47</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C216.1	Write Assembly language programs in 8051 to perform data transfer operation using data transfer instructions of 8051.
C216.2	Write Assembly language programs in 8051 for solving simple problems that manipulate input data using different instructions of 8051.
C216.3	Write Assembly language programs in 8051 to use subroutines.
C216.4	Interface different input and output devices to 8051 and control them using Assembly language programs.
C216.5	Interface the serial devices to 8051 and do the serial transfer using C programming.
<b>Course Name: Analog Circuits Laboratory</b>	
<b>Course Code: 18ECL48</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C217.1	Design analog circuits using FET and evaluate their performance characteristics.
C217.2	Design analog circuits using BJT and evaluate their performance characteristics.



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C217.3	Design analog circuits using OPAMPs for different applications.
C217.4	Design analog circuits using IC 555 timer.
C217.5	Simulate and analyze analog circuits that uses ICs for different electronic applications.
<b>Course Name: Constitution of India &amp; PE</b>	
<b>Course Code: 18CPC49</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C218.1	Describe and analyze the role and salient features of Indian Constitution
C218.2	Understand the structure and powers of Union and State Executives.
C218.3	Relate to the procedures and provisions in the Electoral Process
C218.4	Develop Engineering & Professional ethics and adopt responsibilities expected of an Engineers.
C218.5	Identify the cybercrimes and describe the cyber laws for cyber safety measures.
<b>Course Name: Technological Innovation Management and Entrepreneurship</b>	
<b>Course Code: 18ES51</b>	
<b>Course Outcomes:</b> 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	Understand the components in developing a business plan
C301.4	Understand the concept of Idea Generation and business Feasibility Analysis
C301.5	Describe various sources of funding and institutions supporting entrepreneurs

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**Course Name: Digital Signal Processing**

**Course Code: 18EC52**

**Course Outcomes:** At the end of the course the student will be able to

**C302.1** Determine response of LTI systems using time domain and DFT techniques.

**C302.2** Compute DFT of real and complex discrete time signals.

**C302.3** Computation of DFT using FFT algorithms and linear filtering approach.

**C302.4** Design and realize FIR and IIR digital filters

**C302.5** Understand the DSP processor architecture.

**Course Name: Principles of Communication Systems**

**Course Code: 18EC53**

**Course Outcomes:** At the end of the course the student will be able to

**C303.1** Analyze and compute performance of AM modulation in the presence of noise at the receiver.

**C303.2** Analyze and compute performance of FM modulation in the presence of noise at the receiver.

**C303.3** Analyze and compute performance of digital formatting processes with quantization noise.

**C303.4** Multiplex digitally formatted signals at Transmitter and demultiplex the signals and reconstruct digitally formatted signals at the receiver.

**C303.5** Design/Demonstrate the use of digital formatting in Multiplexers, Vocoders and Video transmission.



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<b>Course Name: Information Theory and Coding</b>	
<b>Course Code: 18EC54</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C304.1</b>	Explain concept of Dependent & Independent Source, measure of information, Entropy, Rate of Information and Order of a source
<b>C304.2</b>	Represent the information using Shannon Encoding, Shannon Fano, Prefix and Huffman Encoding Algorithms
<b>C304.3</b>	Model the continuous and discrete communication channels using input, output and joint probabilities
<b>C304.4</b>	Determine a codeword comprising of the check bits computed using Linear Block codes, cyclic codes & convolutional codes
<b>C304.5</b>	Design the encoding and decoding circuits for Linear Block codes, cyclic codes, convolutional codes
<b>Course Name: Electromagnetic Waves</b>	
<b>Course Code: 18EC55</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C305.1</b>	Evaluate problems on electrostatic force, electric field due to point, linear, volume charges by applying conventional methods and charge in a volume.
<b>C305.2</b>	Apply Gauss law to evaluate Electric fields due to different charge distributions and Volume Charge distribution by using Divergence Theorem
<b>C305.3</b>	Determine potential and energy with respect to point charge and capacitance using Laplace equation and Apply Biot-Savart's and Ampere's laws for evaluating Magnetic field for different current configurations



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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
<b>Course Name: Verilog</b>	
<b>Course Code: 18EC56</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C306.1	Describe digital circuits utilizing various constructs of Verilog.
C306.2	Explain the syntax, lexical conventions, data types, modules and ports.
C306.3	Design the digital system using gate level , dataflow descriptio, Behavioral Description.
C306.4	Write the verilog programs more effectively using tasks and directive, perform timing and delay simulation
C306.5	Interpret the various constructs in logic synthesis.
<b>Course Name: DSP LAB</b>	
<b>Course Code:18ECL57</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C307.1	Understand the concept of analog to digital conversion of signals and frequency domain samples of signals.
C307.2	Model the discrete time signals and systems and verify its properties and results
C307.3	Implement discrete computation using DSP processor and verify the results
C307.4	Realize the digital filters using a simulation tool and analyse the response of the filter for an audio signal
C307.5	Write program using MATLAB /scilab/octave to illustrate DSP concepts



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<b>Course Name: HDL Lab</b>	
<b>Course Code: 18ECL58</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C308.1</b>	Write the Verilog programs to simulate Combinational circuits in Dataflow, Gate level Abstractions
<b>C308.2</b>	Write the Verilog/VHDL programs to simulate Combinational circuits in Behavioral Abstractions
<b>C308.3</b>	Describe sequential circuits like flip flops and counters in Behavioral description and obtain simulation waveforms.
<b>C308.4</b>	Synthesize Combinational and Sequential circuits on programmable ICs and test the hardware.
<b>C308.5</b>	Interface the hardware to the programmable chips and obtain the required output.
<b>Course Name: EVS</b>	
<b>Course Code: 18CIV59</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C309.1</b>	To understand different component of environment and its function.
<b>C309.2</b>	To acquire solutions for global issues with advanced approaches
<b>C309.3</b>	To understand the principles and solutions of environmental problems that applies to air, land, water and waste management
<b>C309.4</b>	To understand the issues on Global environmental concerns with observations.
<b>C309.5</b>	To learn and apply the techniques of assessing environmental impacts through a multidisciplinary approach with various tools

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**Course Name: Digital communication**

**Course Code: 18EC61**

**Course Outcomes:** At the end of the course the student will be able to

- |        |  |
|--------|--|
| C310.1 | Apply the concepts of mathematical transforms to understand the fundamentals of signals in digital communication, and compare different line coding formats. |
| C310.2 | Analyse mathematically the transmission of signals over AWGN channels.   |
| C310.3 | Analyse different digital modulation and detection techniques.   |
| C310.4 | Analyse the transmission of signals through band limited channels.   |
| C310.5 | Apply the principles of secured digital communication systems.   |

**Course Name: Embedded systems**

**Course Code: 18EC62**

**Course Outcomes:** At the end of the course the student will be able to

- |        |  |
|--------|--|
| C311.1 | Understand the architectural features and instruction set of 32 bit microcontroller ARM Cortex M3.                                     |
| C311.2 | Program ARM Cortex M3 using the various instructions and C language for different applications   |
| C311.3 | Understand the basic hardware components and their selection method based on the characteristics and attributes of an embedded system. |
| C311.4 | Develop the hardware software co-design and firmware design approaches.  |
| C311.5 | Explain the need of real time operating system for embedded system applications  |

**Course Name: Microwave & antenna**

**Course Code: 18EC63**



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<b>Course Outcomes:</b> At the end of the course the student will be able to	
C312.1	Describe the use and advantages of microwave transmission.
C312.2	Analyze various parameters related to microwave transmission lines and waveguides
C312.3	Identify microwave devices for several applications
C312.4	Analyze various antenna parameters necessary for building an RF system
C312.5	Recommend various antenna configurations according to the applications
<b>Course Name: Python application programming</b>	
<b>Course Code: 18EC646</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C313.1	Examine Python syntax and semantics and be fluent in the use of Python flow control and functions.
C313.2	Demonstrate proficiency in handling Strings and File Systems
C313.3	Create, run and manipulate Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions
C313.4	Interpret the concepts of ObjectOriented Programming as used in Python.
C313.5	Implement exemplary applications related to Network Programming, Web Services and Databases in Python.
<b>Course Name: Embedded systems lab</b>	
<b>Course Code: 18ECL66</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C314.1	Under the instruction set of 32bit microcontrollerARM Cortex M3,and the software tool required for programming in assembly and C Language
C314.2	Develop assembly language programs using ARM Cortex M3 for different applications

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C314.3	Interface external devices and I/O with ARM Cortex 3
C314.4	Develop C language programs and library functions for embedded system applications
C314.5	Analyse the functions of various peripherals, Peripheral registers and power saving modes of ARM cortex 3

**Course Name: Communication lab**

**Course Code: 18ECL67**

**Course Outcomes:** At the end of the course the student will be able to

C315.1	Determine the characteristics and response of microwave waveguides.
C315.2	Determine the characteristics of microstrip antennas and devices and compute the parameters associated with it.
C315.3	Design and test the analog modulation circuits and display the waveforms.
C315.4	Design and test the digital modulation circuits and display the waveforms.
C315.5	Simulate the digital modulation systems and compare the error performance of basic digital modulation schemes.

**Course Name: Mini-project**

**Course Code: 18ECMP68**

**Course Outcomes:** At the end of the course the student will be able to

C316.1	Implement and practice acquired Technical knowledge within the chosen area of technology for project development
C316.2	Identify, discuss and justify the technical aspects of the chosen project with a comprehensive and systematic approach.
C316.3	Reproduce, improve and refine technical aspects for engineering project
C316.4	Work as an individual or in a team in development of technical projects



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C316.5	Communicate and report effectively project related activities and findings
<b>Course Name: Occupational health and safety</b>	
<b>Course Code: 18CV653</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C317.1	Identify hazards in the workplace that pose a danger or threat to their safety or health, or that of others.
C317.2	Control unsafe or unhealthy hazards and propose methods to eliminate the hazard.
C317.3	Present a coherent analysis of a potential safety or health hazard both verbally and in writing, citing the occupational Health and Safety Regulations as well as supported legislation.
C317.4	Discuss the role of health and safety in the workplace pertaining to the responsibilities of workers, managers, supervisors.
C317.5	Identify the decisions required to maintain protection of the environment, workplace as well as personal health and safety.
<b>Course Name: Computer Networks</b>	
<b>Course Code: 18EC71</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C401.1	Understand the concepts of networking
C401.2	Describe various networking Architectures
C401.3	Identify the protocols and services of different layers
C401.4	Distinguish the basic network Configurations and Standards associated with each networks
C401.5	Analyse the simple network and measure its parameters



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<b>Course Name: VLSI Design</b>	
<b>Course Code: 18EC72</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C402.1</b>	Demonstrate understanding of MOS transistor theory, CMOS fabrication flow and technology scaling.
<b>C402.2</b>	Draw the basic gates using the stick and layout diagrams with the knowledge of physical design aspects.
<b>C402.3</b>	Demonstrate ability to design Combinational, sequential and dynamic logic circuits as per the requirements
<b>C402.4</b>	Interpret Memory elements along with timing considerations
<b>C402.5</b>	Interpret testing and testability issues in VLSI Design
<b>Course Name: Digital Image Processing</b>	
<b>Course Code: 18EC733</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C403.1</b>	Understand fundamentals of image processing
<b>C403.2</b>	Apply image processing techniques in the spatial domain
<b>C403.3</b>	Apply image processing techniques in the frequency domain
<b>C403.4</b>	Conduct independent study on noise restoration models
<b>C403.5</b>	Evaluate the Methodologies for segmentation and Morphological operations and understanding the fundamentals of color image processing
<b>Course Name: Multimedia communication</b>	
<b>Course Code: 18EC743</b>	



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<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C404.1</b>	Understand basics of different multimedia networks and applications.
<b>C404.2</b>	Understand different compression techniques to compress audio and video
<b>C404.3</b>	Describe multimedia Communication across Networks
<b>C404.4</b>	Analyse different media types to represent them in digital form.
<b>C404.5</b>	Compress different types of text and images using different compression techniques
<b>Course Name: Computer Networks Lab</b>	
<b>Course Code: 18ECL76</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C405.1</b>	To choose suitable tool to model a network
<b>C405.2</b>	Use the network simulator for learning and practice of network algorithms
<b>C405.3</b>	Illustrate the operations of network protocols and algorithms using C programs
<b>C405.4</b>	Simulate the network with different configurations to measure the performance parameters
<b>C405.5</b>	Implement the data link and routing algorithms using C Programs
<b>Course Name: VLSI Lab</b>	
<b>Course Code: 18ECL77</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C406.1</b>	Design and simulate combinational and sequential digital circuits using Verilog HDL.
<b>C406.2</b>	Understand the synthesis process of digital circuits using EDA tool.
<b>C406.3</b>	Perform ASIC design flow and understand the process of synthesis, synthesis constraints and evaluating the synthesis reports to obtain optimum gate level netlist



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C406.4	Design and simulate basic CMOS circuits like inverter, common source amplifier and differential amplifier.
C406.5	Perform RTL-GDSII flow and understand the stages in ASIC design
<b>Course Name: Project work Phase-1</b>	
<b>Course Code: 18ECP78</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C407.1	Appreciate how to conduct a Literature and or problem survey, as a team.
C407.2	Identify and analyse problems and choose a methodology as a team.
C407.3	Carry out the project focussing on project management and work under constraints, as a team.
C407.4	Draft a project report, as a team.
C407.5	Communicate and present their ideas reg project in a professional manner, as a team.
<b>Course Name: Wireless &amp; Cellular Communication</b>	
<b>Course Code: 18EC81</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C408.1	Explain concepts of propagation mechanisms like Reflection, Diffraction, Scattering in wirelesschannels.
C408.2	Develop a scheme for idle mode, call set up, call progress handling and call tear down in a GSMcellular network.
C408.3	Develop a scheme for idle mode, call set up, call progress handling and call tear down in a CDMAcellular network.
C408.4	Discuss and analyze the issues involved with multicarrier modulation, multi-antenna transmission and reception methods.
C408.5	Understand the Basic operations of Air interface in a LTE 4G system.



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<b>Course Name: Network Security</b>	
<b>Course Code: 18EC821</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C409.1</b>	Explain network security services and mechanisms and explain security concepts
<b>C409.2</b>	Understand the concept of Transport Level Security and Secure Socket Layer.
<b>C409.3</b>	Explain Security concerns in Internet Protocol security
<b>C409.4</b>	Explain Intruders, Intrusion detection and Malicious Software
<b>C409.5</b>	Describe Firewalls, Firewall Characteristics, Biasing and Configuration
<b>Course Name: Project work Phase-II</b>	
<b>Course Code: 18ECP83</b>	
<b>Course Index:</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C410.1</b>	Appreciate how to conduct a Literature and or problem survey, as a team.
<b>C410.2</b>	Identify and analyse problems and choose a methodology as a team.
<b>C410.3</b>	Carry out the project focussing on project management and work under constraints, as a team.
<b>C410.4</b>	Draft a project report, as a team.
<b>C410.5</b>	Communicate and present their ideas reg project in a professional manner, as a team.
<b>Course Name: Seminar</b>	
<b>Course Code: 18ECS84</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	



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C411.1	Engage in exploring multiple facets and from multiple sources conducting rigorous investigations to address topics beyond their major subject.
C411.2	Demonstrate the ability to think critically developing an orientation towards research.
C411.3	Improve their ability to draft reports undertaking Composition of text in form and content independently in a professional manner, engaging in a rational investigation, through original thinking.
C411.4	Communicate their ideas to an audience professionally.
C411.5	Learn independently being able to refine and expand their abilities to synthesise arguments to be presented for critical review.


**Course Name: Internship/Professional Practice**

**Course Code: 18EC185**

**Course Outcomes:** At the end of the course the student will be able to

C412.1	Acquire practical experience within industry in which the internship is done and apply the knowledge and skills learned to classroom work.
C412.2	Learn by interaction and appreciate professional practices and functions expected of a practicing professional.
C412.3	Understand the mandates of professional standards and communicate in a professional manner giving due consideration to confidentiality clauses.
C412.4	Recognize the areas for future knowledge and skill development and acquire the basic knowledge of administration, marketing, finance and economics
C412.5	Develop the skills to enable lifelong learning.

  
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## Course Outcomes of Information Science & Engineering Program

**Course Name: Transform Calculus, Fourier Series And Numerical Techniques**

**Course Code: 18MAT31**

**Course Index: C201**

**Course Outcomes:** At the end of the course the student will be able to

**C201.1** Use Laplace transform and inverse Laplace transform in solving differential/ integral equations arising in network analysis, control systems and other fields of engineering.

**C201.2** Demonstrate Fourier series to study the behavior of periodic functions & their applications in system communications, digital signal processing & field theory.

**C201.3** Make use of Fourier transform and Z-transform to illustrate discrete/continuous function arising in wave and heat propagation, signals and systems.

**C201.4** Solve first and second order ordinary differential equations arising in engineering problems using single step and multistep numerical methods.

**C201.5** Determine the externals of functionals using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis.

**Course Name: Data Structures and applications**

**Course Code: 18CS32**

**Course Index: C202**

**Course Outcomes:** At the end of the course the student will be able to

**C202.1** Use different types of data structures, operations and algorithms

**C202.2** Apply the different linear data structures like stack and queue to various Computing problems



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C202.3	Construct linked lists to represent data and perform various operations for problem solving.
C202.4	Construct tree and graphs and perform operations to solve the problems
C202.5	Apply searching and sorting operations on files for problem solving.
<b>Course Name:Analog And Digital Electronics</b>	
<b>Course Code:18CS33</b>	
<b>Course Index:C203</b>	
<b>Course Outcomes:</b> 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
<b>Course Name:Computer Organization</b>	
<b>Course Code:18CS34</b>	
<b>Course Index:C204</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C204.1	Explain the basic organization of a computer system



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C204.2	Demonstrate different ways of communicating with I/O devices and standard I/O interfaces
C204.3	Distinguish the organization of various parts of a system memory hierarchy
C204.4	Design and analyze simple arithmetic and logical units.
C204.5	Illustrate hardwired control, micro programmed control and the concept of pipelining
<b>Course Name:Software Engineering</b>	
<b>Course Code:18CS35</b>	
<b>Course Index:C205</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C205.1	Understand the activities involved in software engineering and Develop Software Requirement Specification document
C205.2	Explain the basics of object oriented concepts and build a suitable class model using modeling techniques
C205.3	Illustrate the role of various system models, and identify various design patterns and implementation issues related to the software
C205.4	Describe various software testing methods and the software evolution process and utilize the better testing technique for the project
C205.5	Illustrate the role of project planning and quality management in software development
<b>Course Name:Discrete Mathematical Structures</b>	
<b>Course Code:18CS36</b>	
<b>Course Index:C206</b>	



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<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C206.1</b>	Use of propositional and predicate logic in knowledge representation and truth verification.
<b>C206.2</b>	Demonstrate the ability to solve problems using counting techniques and combinatorics in the context of discrete probability.
<b>C206.3</b>	Solve problems using relations, recurrence relations and functions.
<b>C206.4</b>	Application of different mathematical proofs, techniques in proving theorems in the course
<b>C206.5</b>	Compare graphs, trees, and their applications
<b>Course Name: Analog And Digital Electronics Laboratory</b>	
<b>Course Code: 18CSL37</b>	
<b>Course Index: C207</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C207.1</b>	Analyze, compare and verify analog and digital circuits
<b>C207.2</b>	Use appropriate design equations / methods to design the given circuit
<b>C207.3</b>	Examine and verify the design of both analog and digital circuits using simulators and make use of electronic components, ICs, instruments and tools for design and testing of circuits for the given the appropriate inputs.
<b>C207.4</b>	Compile a laboratory journal which includes; aim, tool/instruments/software/components used, design equations used and designs, schematics, program listing, procedure followed, relevant theory, results as graphs and tables, interpreting and concluding the findings.
<b>C207.5</b>	Illustrate various types of registers, counters, flipflops and analog circuits



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<b>Course Name:Data Structures Laboratory</b>	
<b>Course Code:18CSL38</b>	
<b>Course Index:C208</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C208.1</b>	Analyze and Compare various linear and non-linear data structures
<b>C208.2</b>	Code, debug and demonstrate the working nature of different types of data structures and their applications
<b>C208.3</b>	Implement, analyze and evaluate the searching and sorting algorithms
<b>C208.4</b>	Choose the appropriate data structure for solving real world problems
<b>Course Name:Constitution of India, Professional Ethics and Cyber Law</b>	
<b>Course Code:18CPC39</b>	
<b>Course Index:C209</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C209.1</b>	Explain general knowledge and legal literacy about Indian Constitution and thereby it helps to take ip compitive examinations & to manage/face complex societal issues in society.
<b>C209.2</b>	Explain state and central policies (Union and State Executive), fundamental Rights & thier duties.
<b>C209.3</b>	Explain Electoral Process, Amendments and special provisions in Constitution.
<b>C209.4</b>	Explain powers and functions of Muncipalities, Panchayats and Co-operative Societies with Human Rights and NHRC.
<b>C209.5</b>	Apply Engineering & Professional ethics and responsibilities of Engineers.



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<b>Course Name:Engineering Maths-IV</b>	
<b>Course Code:18MAT41</b>	
<b>Course Index:C210</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C210.1</b>	Use the concepts of analytic function and complex potentials to solve the problems arising in electromagnetic field theory.
<b>C210.2</b>	Utilize conformal transformation and complex integral arising in aerofoil theory, fluid flow visualization and image processing.
<b>C210.3</b>	Apply discrete and continuous probability distributions in analyzing the probability models arising in engineering field.
<b>C210.4</b>	Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data.
<b>C210.5</b>	Construct joint probability distributions and demonstrate the validity of testing the hypothesis.
<b>Course Name:Design and Anlaysis of Algorithms</b>	
<b>Course Code:18CS42</b>	
<b>Course Index:C211</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C211.1</b>	Analyse a given algorithm and express different algorithms along with its time and space complexity in asymptotic notations.
<b>C211.2</b>	Design and analyze algorithms using divide and conquer strategy
<b>C211.3</b>	Solve optimization problem using greedy method.

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C211.4	Apply dynamic programming to solve problems using the solutions of similar subproblems.
C211.5	Design and apply backtracking algorithm and branch and bound technique for problem solving
<b>Course Name:Operating Systems</b>	
<b>Course Code:18CS43</b>	
<b>Course Index:C212</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C212.1	Describe the general architecture of computers
C212.2	Demonstrate need for OS and different types of OS
C212.3	Apply suitable techniques for management of different resources
C212.4	Use processor, memory, storage and file system commands
C212.5	Realize the different concepts of OS in platform of usage through case studies
<b>Course Name:Microcontroller And Embedded Systems</b>	
<b>Course Code:18CS44</b>	
<b>Course Index:C213</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C213.1	Describe the architectural features and instructions of ARM microcontroller
C213.2	Apply the knowledge gained for Programming ARM for different applications. Interface external devices and I/O with ARM microcontroller.



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C213.3	Interpret the basic hardware components and their selection method based on the characteristics and attributes of an embedded system.
C213.4	Develop the hardware /software co-design and firmware design approaches.
C213.5	Demonstrate the need of real time operating system for embedded system applications
<b>Course Name: Object Oriented Concepts</b>	
<b>Course Code: 18CS45</b>	
<b>Course Index: C214</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C214.1	Explain the object-oriented concepts and C++
C214.2	Understand basic concepts and applications of java and all aspects of classes and objects.
C214.3	Develop Multi-Threaded applications and to understand basic concepts of event handling in java.
C214.4	Develop simple GUI interfaces for a computer program to interact with users.
C214.5	Understand the event-based GUI handling principles using Applets and swings
<b>Course Name: Data Communication</b>	
<b>Course Code: 18CS46</b>	
<b>Course Index: C215</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C215.1	Explain the various components of data communication.
C215.2	Apply the fundamentals of digital transmission
C215.3	Describe bandwidth utilization and switching in data communication



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C215.4	Compare and contrast data link layer protocols.
C215.5	Summarize IEEE 802.xx standards –Wired and Wireless LANs
<b>Course Name:Design and Anlaysia of Algorithms Laboratory</b>	
<b>Course Code:18CSL47</b>	
<b>Course Index:C216</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C216.1	Design algorithms using appropriate design techniques (brute-force, greedy, dynamic programming, etc.)
C216.2	Implement a variety of algorithms such assorting, graph related, combinatorial, etc., in a high level language.
C216.3	Analyze and compare the performance of algorithms using language features.
C216.4	Apply and implement learned algorithm design techniques and data structures to solve real-world problems.
C216.5	Implement the obejct - Oriented Concepts, Exceptions and Multithreading using java programming
<b>Course Name:Microcontroller And Embedded Systems Laboratory</b>	
<b>Course Code:18CSL48</b>	
<b>Course Index:C217</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C217.1	Analyze, compare the working of processor for different applications and the functioning hardware device



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C217.2	Apply the knowledge of ARM instructions to develop assembly language program and to design various functions of microcontroller
C217.3	Implement program written using ARM instructions and analyses, evaluate various functions
C217.4	Compile a laboratory journal which includes; aim, tool/instruments/software/components used, design equations used and designs, schematics, program listing, procedure followed, relevant theory, results as graphs and tables, interpreting and concluding the findings.
C217.5	Illustrate various types and methods of microcontrollers and embedded systems
<b>Course Name:Kannada</b>	
<b>Course Code:18KAK/VK49</b>	
<b>Course Index:C218</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C218.1	Explain the grammar in kannada language and their awareness
C218.2	understand the simple words in kannada language
C218.3	translate kannada to english language and vice versa
C218.4	build communications skills in day to day activities
C218.5	develop interest on kannada language and literature
<b>Course Name:MANAGEMENT AND ENTREPRENEURSHIP FOR IT INDUSTRY</b>	
<b>Course Code:18CS51</b>	
<b>Course Index:C301</b>	



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<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C301.1</b>	Explain the basic concepts of management, planning, Organizing and Staffing.
<b>C301.2</b>	Summarize the appropriate leadership styles, motivation theories, communications, Coordination and controlling, methods.
<b>C301.3</b>	Interpret the meaning of entrepreneur, entrepreneurship and role in economic development on India. Along with Identification of business opportunities and feasibility study
<b>C301.4</b>	Inferring the new ideas, Prepare project report based on guidelines of planning commission by utilizing the resources available effectively through ERP
<b>C301.5</b>	Explain the IPRs and institutional support in Micro and Small Enterprises as per the Indian Industrial Policy 2007.
<b>Course Name:Computer Networks and Security</b>	
<b>Course Code:18CS52</b>	
<b>Course Index:C302</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C302.1</b>	Understand and analyze the principles of application layer protocols
<b>C302.2</b>	Outline the transport layer services and infer UDP and TCP protocols
<b>C302.3</b>	Examine and classify routers, IP and Routing Algorithms in network layer
<b>C302.4</b>	Understand and apply the computer network security Mechanisms
<b>C302.5</b>	Illustrate Multimedia Networking and Network Management
<b>Course Name:Database Management System</b>	



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<b>Course Code:18CS53</b>	
<b>Course Index:C303</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C303.1</b>	Identify an information storage problem and derive an information model expressed in the form of an entity relation diagram.
<b>C303.2</b>	Construct a physical design for a database from its logical design by using relational algebra and SQL.
<b>C303.3</b>	Develop a database application system and use advanced SQL tools using an SQL interface and JDBC.
<b>C303.4</b>	Apply normalization techniques in real-life Database Applications.
<b>C303.5</b>	Apply techniques for controlling the consequences of concurrent data access and database recovery.
<b>Course Name:Automata Theory And Computability</b>	
<b>Course Code:18CS54</b>	
<b>Course Index:C304</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C304.1</b>	Acquire fundamental understanding of the core concepts in automata theory and theory of computation.
<b>C304.2</b>	Learn how to identify and translate between different formal language representations.
<b>C304.3</b>	Design Grammars and Automata for different language classes.
<b>C304.4</b>	Develop skills in formal reasoning and reduction of a problem to a formal model.
<b>C304.5</b>	Determine the decidability and intractability of Computational problems.



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<b>Course Name:Application Development Using Python</b>	
<b>Course Code:18CS55</b>	
<b>Course Index:C305</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C305.1</b>	Demonstrate proficiency in handling of loops and creation of functions.
<b>C305.2</b>	Identify the methods to create and manipulate lists, tuples and dictionaries.
<b>C305.3</b>	Discover the commonly used operations involving regular expressions and file system
<b>C305.4</b>	Interpret the concepts of Object-Oriented Programming as used in Python
<b>C305.5</b>	Determine the need for scraping websites and working with CSV, JSON and other file formats
<b>Course Name:Unix Programming</b>	
<b>Course Code:18CS56</b>	
<b>Course Index:C306</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C306.1</b>	Explain Unix Architecture, File system and use of Basic Commands
<b>C306.2</b>	Illustrate Shell Programming and to write Shell Scripts
<b>C306.3</b>	Categorize, compare and make use of Unix System Calls
<b>C306.4</b>	Interpret the use of various IPC methods and shared memory
<b>C306.5</b>	Understand the basic concepts of signals and daemon process
<b>Course Name:Computer Networks Laboratory</b>	



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**Course Code:18CSL57**

**Course Index:C307**

**Course Outcomes:** At the end of the course the student will be able to

C307.1	Analyze and Compare various networking protocols.
C307.2	Demonstrate the working of different concepts of networking.
C307.3	Implement, analyze and evaluate networking protocols in NS2 / NS3 and JAVA programming language

**Course Name:DBMS Laboratory With Mini Project**

**Course Code:18CSL58**

**Course Index:C308**

**Course Outcomes:** At the end of the course the student will be able to

C308.1	Design conceptual models of a database using schema and ER modelling.
C308.2	Construct and query the database using SQL DDL/DML Commands and enforce integrity constraints using RDBMS.
C308.3	Apply the concept of embedded and nested queries and create stored procedure and triggers to meet the desired needs.
C308.4	Apply the concepts of normalization to design an optimal database.
C308.5	Develop a database application system using advanced SQL tools and interfaces with appropriate documentation by incorporating ethical standards.

**Course Name:Environmental Studies**

**Course Code:18CIV59**



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<b>Course Index:C309</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C309.1</b>	To understand different component of environment and its function.
<b>C309.2</b>	To acquire solutions for global issues with advanced approaches or question related to the environment.
<b>C309.3</b>	To Understand the principles and solutions of environmental problems that apply to air, land, water and waste management
<b>C309.4</b>	To Understand the issues on Global environmental concerns with observations.managers face when dealing with complex issues.
<b>C309.5</b>	To learn and apply the techniques of assessing environmental impacts through a multidisciplinary approach with various tools
<b>Course Name: File Structures</b>	
<b>Course Code:18IS61</b>	
<b>Course Index:C310</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C310.1</b>	Choose appropriate file structure for storage representation.
<b>C310.2</b>	Identify a suitable sorting technique to arrange the data.
<b>C310.3</b>	Identify the techniques for Merging and Sorting of Large Files
<b>C310.4</b>	Select suitable indexing for better performance to a given problem.
<b>C310.5</b>	Choose hashing techniques for better performance to a given problem.
<b>Course Name:Software Testing</b>	



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<b>Course Code:18IS62</b>	
<b>Course Index:C311</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C311.1</b>	Identify test cases for any given problem
<b>C311.2</b>	Compare the different testing techniques
<b>C311.3</b>	Classify the problem into suitable testing model
<b>C311.4</b>	Apply the appropriate technique for the design of flow graph.
<b>C311.5</b>	Create appropriate document for the software artifact.
<b>Course Name:Web Technology And its applications</b>	
<b>Course Code:18CS63</b>	
<b>Course Index:C312</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C312.1</b>	Adapt HTML and CSS syntax and semantics to build web pages.
<b>C312.2</b>	Construct and visually format tables and forms using HTML and CSS
<b>C312.3</b>	Develop Client-Side Scripts using JavaScript and Server-Side Scripts using PHP to generate and display the contents dynamically.
<b>C312.4</b>	Appraise the principles of object oriented development using PHP
<b>C312.5</b>	Inspect JavaScript frameworks like jQuery and Backbone which facilitates developer to focus on core features.
<b>Course Name:Data Mining And Data Warehousing</b>	
<b>Course Code:18CS641</b>	



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<b>Course Index:C313</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C313.1</b>	Identify and Design data warehouse with dimensional modelling and apply OLAP operations.
<b>C313.2</b>	Analyse the fundamental Data Mining tasks and Measures of Similarity and Dissimilarity
<b>C313.3</b>	Write Association rules for a given data pattern
<b>C313.4</b>	Apply various classification algorithms for given dataset
<b>C313.5</b>	Compare different approaches of cluster analysis
<b>Course Name: ADVANCED LINEAR ALGEBRA</b>	
<b>Course Code: 18MAT653</b>	
<b>Course Index: C314</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C314.1</b>	Analyze whether a system is consistent or inconsistent, its solution is unique or infinite and find bases and dimension of vector spaces required in network analysis.
<b>C314.2</b>	Linearly transform the system from one dimension to another in matrix form ,required to analyze image processing problems.
<b>C314.3</b>	Compute orthogonal and orthonormal basis vectors required to analyze image and signal processing problems.
<b>C314.4</b>	Apply techniques of constrained optimization and singular value decomposition for problems arising in control system analysis, signals and systems.
<b>C314.5</b>	Apply linear algebraic tools to analyze problems in graphs and networks problems, computer graphics.

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<b>Course Name:Software Testing Laboratory</b>	
<b>Course Code:18ISL66</b>	
<b>Course Index:C315</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C315.1</b>	List out the requirements for the given problem
<b>C315.2</b>	Design and implement the solution for given problem in any programming language(C,C++,JAVA)
<b>C315.3</b>	Derive test cases for any given problem
<b>C315.4</b>	Apply the appropriate technique for the design of flow graph.
<b>C315.5</b>	Create appropriate document for the software artefact.
<b>Course Name:File Structures Laboratory with mini project</b>	
<b>Course Code:18ISL67</b>	
<b>Course Index:C316</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C316.1</b>	Implement operations related to files
<b>C316.2</b>	Apply the concepts of file system to produce the given application.
<b>C316.3</b>	Evaluate performance of various file systems on given parameters.
<b>C316.4</b>	Perform Various Operations on Filed and Records
<b>C316.5</b>	Implement mini project using the concepts studied from the theory subject



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<b>Course Name: Mobile Application Development Lab</b>	
<b>Course Code: 18CSMP68</b>	
<b>Course Index: C317</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C317.1</b>	Create, test and debug Android application by setting up Android development environment.
<b>C317.2</b>	Implement adaptive, responsive user interfaces that work across a wide range of devices.
<b>C317.3</b>	Infer long running tasks and background work in Android applications.
<b>C317.4</b>	Demonstrate methods in storing, sharing and retrieving data in Android applications.
<b>C317.5</b>	Infer the role of permissions and security for Android applications.
<b>Course Name: Artificial Intelligence and Machine Learning</b>	
<b>Course Code: 18CS71</b>	
<b>Course Index: C401</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C401.1</b>	Appraise the theory of Artificial intelligence and Machine Learning.
<b>C401.2</b>	Illustrate the working of AI and ML Algorithms.
<b>C401.3</b>	Demonstrate the applications of AI and ML.
<b>Course Name: Big Data and Analytics</b>	
<b>Course Code: 18CS72</b>	
<b>Course Index: C402</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	

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C402.1	Understand fundamentals of Big Data analytics.
C402.2	Investigate Hadoop framework and Hadoop Distributed File system.
C402.3	Illustrate the concepts of NoSQL using MongoDB and Cassandra for Big Data.
C402.4	Demonstrate the MapReduce programming model to process the big data along with Hadoop tools.
C402.5	Use Machine Learning algorithms for real world big data, Analyze web contents and Social Networks to provide analytics with relevant visualization tools
<b>Course Name: Software Architecture and Design Pattern</b>	
<b>Course Code: 18CS731</b>	
<b>Course Index:C403</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C403.1	Design and implement codes with higher performance and lower complexity
C403.2	aware of code qualities needed to keep code flexible
C403.3	experience core design principles and be able to assess the quality of a design with respect to these principles.
C403.4	capable of applying these principles in the design of object oriented systems.
C403.5	demonstrate an understanding of a range of design patterns. Be capable of comprehending a design presented using this vocabulary.
C403.6	select and apply suitable patterns in specific contexts
<b>Course Name: Cryptography</b>	
<b>Course Code: 18CS744</b>	
<b>Course Index:C404</b>	



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<b>Course Outcomes:</b> At the end of the course the student will be able to	
C404.1	Define cryptography and apply its principles
C404.2	Explain Cryptography algorithms
C404.3	Illustrate Public and Private key cryptography
C404.4	Explain Key management, distribution and certification
C404.5	Explain authentication protocols
C404.6	Explain about IPsec

**Course Name: Neural Networks**

**Course Code: 18EC752**

**Course Index: C405**

**Course Outcomes:** At the end of the course the student will be able to

C405.1	Understand the role of neural networks in engineering, artificial intelligence, and cognitive modelling
C405.2	Course outcomes focus on Understanding the concepts and techniques of neural networks through the study of the most important neural network models
C405.3	Evaluate whether neural networks are appropriate to a particular application.
C405.4	Apply neural networks to particular application, and to know what steps to take to improve performance
C405.5	Understand the steps to take to improve performance

**Course Name: Artificial Intelligence and Machine Learning Laboratory**

**Course Code: 18CSL76**

**Course Index: C406**

**Course Outcomes:** At the end of the course the student will be able to



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C406.1	Implement and demonstrate AI and ML algorithms.
C406.2	Evaluate different algorithms.
<b>Course Name: Project Work Phase - 1</b>	
<b>Course Code: 18CSP77</b>	
<b>Course Index:C407</b>	
<b>Course Outcomes:</b> 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 the project through detailed review energy and technology
C407.2	identify applicable tools to implement and exhibit the proposed project
C407.3	Incorporate the social, environmental and ethical issues effectively into solution of an engineering problem
C407.4	Contribute effectively as a team member or leader to manage the project timeline
C407.5	Write pertinent project reports and make effective project Presentations
<b>Course Name: Internet of Things</b>	
<b>Course Code: 18CS81</b>	
<b>Course Index:C408</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C408.1	Interpret the impact and challenges posed by IoT networks leading to new architectural models.
C408.2	Compare and contrast the deployment of smart objects and the technologies to connect them to network.
C408.3	Appraise the role of IoT protocols for efficient network communication.



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C408.4	Elaborate the need for Data Analytics and Security in IoT.
C408.5	Illustrate different sensor technologies for sensing real world entities and identify the applications of IoT in Industry.
<b>Course Name: Storage Area Networks</b>	
<b>Course Code: 18CS822</b>	
<b>Course Index:C409</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C409.1	Identify key challenges in managing information and analyze different storage networking technologies and virtualization
C409.2	Explain components and the implementation of NAS
C409.3	Describe CAS architecture and types of archives and forms of virtualization
C409.4	Illustrate the storage infrastructure and management activities
<b>Course Name: Project Work Phase –2</b>	
<b>Course Code: 18CSP83</b>	
<b>Course Index:C410</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C410.1	Apply identified knowledge to solve a complex engineering problem and design a solution, implement and test the proposed solution
C410.2	Incorporate the social, environmental and ethical issues effectively into solution of an engineering problem
C410.3	Contribute effectively as a team member or leader to manage the project timeline



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C410.4	Use synthesis/modelling to simulate and solve a problem or apply appropriate method of analysis to draw valid conclusions and present, demonstrate, execute final version of project
C410.5	Compile the report and take part in present / publishing the finding in a reputed conference / publications and make effective presentation
<b>Course Name: Technical Seminar</b>	
<b>Course Code: 18CSS84</b>	
<b>Course Index:C411</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C411.1	Establish motivation for any topic of interest and develop a thought process for technical presentation
C411.2	Identify recent technical topics from interested doomains
C411.3	anlyze the applicability of modern software tools and technology
C411.4	develope presentation and communication skills

NBA Coordinator

HOD - ISE

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## Course Outcomes of Mechanical Engineering Program

**Course Name: Transform Calculus, Fourier Series And Numerical Techniques**

**Course Code: 18MAT31**

**Course Index: C201**

**Course Outcomes:** At the end of the course the student will be able to

C201.1	Use Laplace transform and inverse Laplace transform in solving differential/ integral equations arising in network analysis, control systems and other fields of engineering.
C201.2	Demonstrate Fourier series to study the behavior of periodic functions & their applications in system communications, digital signal processing & field theory.
C201.3	Make use of Fourier transform and Z-transform to illustrate discrete/continuous function arising in wave and heat propagation, signals and systems.
C201.4	Solve first and second order ordinary differential equations arising in engineering problems using single step and multistep numerical methods.
C201.5	Determine the external of functionals using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis.

**Course Name: Mechanics of Materials**

**Course Code: 18ME32**

**Course Index: C202**

**Course Outcomes:** At the end of the course the student will be able to

C202.1	Analyze the stresses induced in straight, tapered and composite bars.
C202.2	Evaluate the Principal stresses using analytical & Mohr's circle method and study the types of stresses induced in cylinders



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C202.3	Analyze the distribution of shear force, bending moment and stresses in beams under different loading and support conditions.
C202.4	Understand theories of failure in Engineering materials and analyze the shear stress in shafts under torsion
C202.5	Analyze the stability of columns under buckling load and study the concept of strain energy for different loading conditions

**Course Name: Basic Thermodynamics**

**Course Code: 18ME33**

**Course Index: C203**

**Course Outcomes:** At the end of the course the student will be able to

C203.1	Understand the fundamental concepts of thermodynamics and energy interactions in thermodynamic systems.
C203.2	Apply the first law of thermodynamics to cyclic and non-cyclic processes.
C203.3	Apply the knowledge of entropy, reversibility and irreversibility to determine quantity of energy transfers in thermodynamic systems.
C203.4	Interpret the behaviour of pure substances during phase change using steam table.
C203.5	Recognize differences between ideal & real gases and evaluate their thermodynamic properties using thermodynamic relations

**Course Name: Material Science**

**Course Code: 18ME34**

**Course Index: C204**

**Course Outcomes:** At the end of the course the student will be able to

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C204.1	Understand the crystal structure and mechanical properties of engineering materials.
C204.2	Understand the modes of failure in engineering materials and analyse their behaviour under phase transformation.
C204.3	Describe the suitable heat treatment processes for ferrous and non-ferrous alloys.
C204.4	Acquire the knowledge of composite materials, production processes and applications.
C204.5	Explain the properties and potentialities of ceramics, plastics and smart materials
<b>Course Name: Metal Cutting And Forming</b>	
<b>Course Code: 18ME35A</b>	
<b>Course Index: C205</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C205.1	Explain the construction & specification of metal cutting tools.
C205.2	Understand the machining processes of milling, shaping, grinding, drilling, planing and slotting
C205.3	Analyse the reliability of machine tools for various machining parameters.
C205.4	Understand the different metal forming processes.
C205.5	Design sheet metal dies to fabricate sheet metal components.
<b>Course Name: Mechanical Measurements And Metrology</b>	
<b>Course Code: 18ME36B</b>	
<b>Course Index: C206</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	



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C206.1	Understand the objectives, methods & standards of mechanical measurements and metrology.
C206.2	Explain the system of limits, fits, tolerance, gauging and working principle of comparators.
C206.3	Demonstrate the measurement parameters of screw threads and gears.
C206.4	Explain the working principle of transducers, intermediate modifying devices and terminating devices using the basic concepts of measurement systems.
C206.5	Describe functioning of force, torque, pressure, strain and temperature measuring devices.

**Course Name: Mechanical Measurements And Metrology Lab**

**Course Code: 18MEL37B**

**Course Index: C207**

**Course Outcomes:** At the end of the course the student will be able to

C207.1	Conduct experiments to calibrate and evaluate mechanical measurement systems using universal standards
C207.2	Analyze the theoretical and experimental concepts of mechanical measurements and metrology.
C207.3	Understand and discuss the basic principle of mechanical measurements and metrology.

**Course Name: Foundry, Forging And Welding Lab**

**Course Code: 18MEL38B**

**Course Index: C208**

**Course Outcomes:** At the end of the course the student will be able to

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C208.1	Conduct experiments to measure the properties of molding sand and prepare foundry, forging and welding models.
C208.2	Analyze the theoretical and experimental concepts of foundry, forging and welding.
C208.3	Discuss the concepts of foundry, forging and welding.
<b>Course Name: Constitution Of India, Professional Ethics And Cyber Law</b>	
<b>Course Code: 18CPC39</b>	
<b>Course Index: C209</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C209.1	Have constitutional knowledge and legal literacy.
C209.2	Understand Engineering and Professional ethics and responsibilities of Engineers.
C209.3	Understand the the cybercrimes and cyber laws for cyber safety measures.
<b>Course Name: Complex Analysis, Probability And Statistical Methods</b>	
<b>Course Code: 18MAT41</b>	
<b>Course Index: C210</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C210.1	Use the concepts of analytic function and complex potentials to solve the problems arising in electromagnetic field theory.
C210.2	Utilize conformal transformation and complex integral arising in aerofoil theory, fluid flow visualization and image processing.
C210.3	Apply discrete and continuous probability distributions in analyzing the probability models arising in engineering field.



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C210.4	Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data.
C210.5	Construct joint probability distributions and demonstrate the validity of testing the hypothesis.
<b>Course Name: Applied Thermodynamics</b>	
<b>Course Code: 18ME42</b>	
<b>Course Index: C211</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C211.1	Describe the IC engine cycles and evaluate the heat transfer.
C211.2	Analyze the working principles of simple Rankine cycle, regenerative and reheat vapour cycle.
C211.3	Describe the working principles of Gas Power Cycles and Jet Propulsion engines.
C211.4	Evaluate the performance parameters of Refrigeration and Air conditioning.
C211.5	Analyze the performance parameters of reciprocating air compressors and steam nozzles.
<b>Course Name: Fluid Mechanics</b>	
<b>Course Code: 18ME43</b>	
<b>Course Index: C212</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C212.1	Understand the key fluid properties used in the analysis of fluid behavior and the principles of fluid statics on submerged bodies.



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C212.2	Apply the principles of buoyancy, floatation and fluid kinematics to address engineering problems.
C212.3	Describe the concept of laminar and turbulent flows and apply the principle of fluid dynamics in fluid flow systems
C212.4	Analyze the flow over bodies and correlate flow parameters using dimensional analysis
C212.5	Understand the basic concepts of compressible flow and applications of CFD

**Course Name: Kinematics of Machines**

**Course Code: 18ME44**

**Course Index: C213**

**Course Outcomes:** At the end of the course the student will be able to

C213.1	Understand the working and inversions of four-bar & slider crank mechanisms.
C213.2	Analyse the velocity, acceleration of links and joints of mechanisms using graphical methods
C213.3	Analyse the velocity, acceleration of links and joints of mechanisms using analytical methods.
C213.4	Analyse cam follower for the motion specifications.
C213.5	Determine the spur gear parameters, velocity ratio and torque of epicyclic gear trains.

**Course Name: Metal Casting And Welding**

**Course Code: 18ME45B**

**Course Index: C214**

**Course Outcomes:** At the end of the course the student will be able to



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C214.1	Describe the casting process and prepare different types of cast products.
C214.2	Explain the concept of melting furnaces and metal mould castings.
C214.3	Understand the solidification process and casting of non-ferrous metals.
C214.4	Compare conventional and advanced welding processes.
C214.5	Describe the methods for quality assurance of components made of casting and joining process

**Course Name: Computer Aided Machine Drawing**

**Course Code: 18ME46A**

**Course Index: C215**

**Course Outcomes:** At the end of the course the student will be able to

C215.1	Understand sections of solids , Orthographic views of machine parts with and without sectioning in 2D
C215.2	Interpret thread terminology ,fasteners for the 2D parts
C215.3	Understand assembly of 3D parts of various machine components
C215.4	Apply knowledge of solid edge in various 2D and 3D work

**Course Name: Material Testing Lab**

**Course Code: 18MEL47A**

**Course Index: C216**

**Course Outcomes:** At the end of the course the student will be able to

C216.1	Conduct standard tests to study the structural and mechanical properties of materials.
C216.2	Analyze the theoretical concepts of engineering materials and their failure modes.
C216.3	Discuss the behaviour of engineering materials and their reliability in service.

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<b>Course Name: Workshop And Machine Shop Practice</b>	
<b>Course Code: 18MEL48A</b>	
<b>Course Index: C217</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C217.1</b>	Perform fitting and machining operations to develop models as per given dimensions.
<b>C217.2</b>	Analyze the theoretical and experimental concepts of machines and machining operations
<b>C217.3</b>	Discuss the principle of machining operations, tool parameters and fitting.
<b>Course Name: Vyavarika Kannada</b>	
<b>Course Code: 18KAK49</b>	
<b>Course Index: C218</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C218.1</b>	To understand the necessity of learning the local language for a comfortable life.
<b>C218.2</b>	To Listen and understand the Kannada language properly.
<b>C218.3</b>	To speak, read and write Kannada language as per requirement.
<b>C218.4</b>	To communicate (converse) in Kannada language in their daily life with kannada speakers.
<b>Course Name: Management And Economics</b>	
<b>Course Code: 18ME51</b>	
<b>Course Index: C301</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	



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C301.1	Explain the development of management and the role it plays at different levels in an organization
C301.2	Comprehend the process and role of effective planning,organizing and staffing for the development of an organization
C301.3	Understand engineering economics demand supply and it's importance in economics decision making and problem solving
C301.4	Evaluate present worth ,annual worth and IRR for different alternatives in economics decision making
C301.5	Understand the procedure involved in estimation of cost for a simple component, product costing and depreciation,it's method

**Course Name: Design of Machine Elements – I**

**Course Code: 18ME52**

**Course Index: C302**

**Course Outcomes:** At the end of the course the student will be able to

C302.1	Analyze the stresses in machine components under static loading using theories of failure.
C302.2	Analyze the behaviour of machine components under impact and fatigue loading.
C302.3	Design shafts and couplings using design standards.
C302.4	Design riveted and welded joints using design standards.
C302.5	Design temporary joints, threaded fasteners and power screws using design standards.

**Course Name: Dynamics Of Machines**

**Course Code: 18ME53**

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<b>Course Index: C303</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C303.1</b>	Analyse the mechanisms for static and dynamic equilibrium.
<b>C303.2</b>	Conduct the balancing of rotating and reciprocating masses.
<b>C303.3</b>	Determine the characteristics of governors and study gyroscopic effects on disks, airplanes, stability of ships, two and four wheelers.
<b>C303.4</b>	Understand the concepts of free vibration and determine its characteristics.
<b>C303.5</b>	Understand the concepts of forced vibration and determine the natural frequency, force and motion transmitted in vibrating systems.
<b>Course Name: Turbo Machines</b>	
<b>Course Code: 18ME54</b>	
<b>Course Index: C304</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C304.1</b>	Apply dimensional analysis on model studies and thermodynamic analysis of turbomachines
<b>C304.2</b>	Understand the basic concept of energy transfer and draw velocity triangles for turbomachines.
<b>C304.3</b>	Understand the concept of steam turbines and evaluate energy transfer using velocity triangles.
<b>C304.4</b>	Understand the concept of hydraulic turbines and evaluate energy transfer using velocity triangles.
<b>C304.5</b>	Evaluate the performance parameters of centrifugal pumps, centrifugal compressors and axial flow compressors.



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<b>Course Name: Fluid Power Engineering</b>	
<b>Course Code: 18ME55</b>	
<b>Course Index: C305</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C305.1</b>	Describe components of fluid power systems and their functional requirements for power transmission.
<b>C305.2</b>	Visualize the circuits of pumps and actuators in hydraulic systems.
<b>C305.3</b>	Describe the functioning of control valves in the hydraulic system and analyze hydraulic circuit design.
<b>C305.4</b>	Describe the working of pneumatic systems and analyze the circuit design.
<b>C305.5</b>	Apply control circuits for hydraulic and pneumatic systems.
<b>Course Name: Operation Management</b>	
<b>Course Code: 18ME56</b>	
<b>Course Index: C306</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C306.1</b>	Acquire a sound knowledge on the principles of operations management
<b>C306.2</b>	Use forecasting methods, principles/ methods of scheduling and sequencing, methods of maintenance planning and control, concepts/technique supply chain management for operations management
<b>C306.3</b>	Select and use an appropriate principles/methods/techniques/modern concepts with reference to given application/situation in the mechanical systems/projects management and finance



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C306.4	Develop and implement new ideas/modern concepts with reference to given application/situation for best manufacturing practices.
C306.5	Preparation and ability to engage in independent and life-long learning in the context of technological change in operations management.
<b>Course Name: Fluid Mechanics &amp; Machines Lab</b>	
<b>Course Code: 18MEL57</b>	
<b>Course Index: C307</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C307.1	Conduct experiments to evaluate performance parameters of flow measuring devices and hydraulic machines.
C307.2	Analyse the theoretical and experimental concepts in flow measuring devices and hydraulic machines.
C307.3	Discuss the principle of fluid flow measuring devices and hydraulic machines.
<b>Course Name: Energy Conversion Lab</b>	
<b>Course Code: 18MEL58</b>	
<b>Course Index: C308</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C308.1	Conduct experiments to evaluate the properties of fuels and performance, emission parameters of I.C. Engine.
C308.2	Analyse the theoretical and experimental concepts in fuels and I.C. Engine.
C308.3	Discuss the principle of I.C. Engine cycles and emission formation.

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<b>Course Name: Environmental Studies</b>	
<b>Course Code: 18CIV59</b>	
<b>Course Index: C309</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C309.1</b>	Understand the principles of ecology and environmental issues that apply to air, land, and water issues on a global scale,
<b>C309.2</b>	Develop critical thinking and/or observation skills, and apply them to the analysis of a problem or question related to the environment.
<b>C309.3</b>	Demonstrate ecology knowledge of a complex relationship between biotic and abiotic components.
<b>C309.4</b>	Apply their ecological knowledge to illustrate and graph a problem and describe the realities that managers face when dealing with complex issues.
<b>Course Name: Finite Element Analysis</b>	
<b>Course Code: 18ME61</b>	
<b>Course Index: C310</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C310.1</b>	Apply formulation methods in FEM to simple structural members by using interpolation models.
<b>C310.2</b>	Develop global equations to attain interpolation functions for higher order elements and solve 1-D bar & Truss problems using FEM techniques.
<b>C310.3</b>	Analyze 1-D beams and shafts with suitable boundary conditions and global equations.
<b>C310.4</b>	Solve heat transfer and fluid flow problems by using FE principles.



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C310.5	Analyze axisymmetric solid elements and formulate mass matrices for dynamic problems.
<b>Course Name: Design Of Machine Elements II</b>	
<b>Course Code: 18ME62</b>	
<b>Course Index: C311</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C311.1	Apply design principles for springs, belts, pulleys and wire ropes.
C311.2	Design spur and helical gear as per universal standards.
C311.3	Design bevel and worm gear as per universal standards.
C311.4	Analyse the working of brakes and clutches using standard equations.
C311.5	Apply design concepts of hydrodynamic bearings and select anti friction bearings using the manufacturer's catalogue for tribological applications.
<b>Course Name: Heat Transfer</b>	
<b>Course Code: 18ME63</b>	
<b>Course Index: C312</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C312.1	Apply the laws of heat transfer and boundary conditions to thermal systems.
C312.2	Analyze transient heat conduction and evaluate performance parameters of extended surfaces.
C312.3	Understand heat conduction through numerical methods and apply the fundamental principle to solve radiation heat transfer problems



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C312.4	Analyze heat transfer due to free and forced convective heat transfer.
C312.5	Apply the concept of heat transfer in boiling & condensation and design heat exchangers using LMTD & NTU methods
<b>Course Name: Non-Traditional Machining</b>	
<b>Course Code: 18ME641</b>	
<b>Course Index: C313</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C313.1	Understand the need of non- traditional machining and compare it with the traditional machining process.
C313.2	Understand the construction, working and features of ultrasonic, abrasive jet and water jet machining.
C313.3	Identify the need of chemical and electro-chemical machining processes for advanced manufacturing.
C313.4	Describe the construction, working and features of electrical discharge and plasma arc machining .
C313.5	Explain the construction, working and features of laser and electron beam machining.
<b>Course Name: Non-Conventional Energy Sources</b>	
<b>Course Code: 18ME651</b>	
<b>Course Index: C314</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C314.1	Describe the environmental aspects of non-conventional energy resources in comparison with conventional energy systems and latest developments.

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C314.2	Understand the fundamentals of solar radiation and its applications in heating, cooling, desalination, power generation, drying and cooking.
C314.3	Analyze the performance of solar flat plate collector using fundamentals of heat transfer.
C314.4	Explain the energy generation using wind, tidal and ocean thermal energy resources.
C314.5	Discuss the power generation from geothermal, biomass and hydrogen energy resources.
<b>Course Name: Computer Aided Modelling and Analysis Lab</b>	
<b>Course Code: 18MEL66</b>	
<b>Course Index: C315</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C315.1	Use the modern tools to simulate mechanical engineering problems.
C315.2	Compare the computational results with analytical solutions of mechanical engineering problems.
C315.3	Discuss the basic principle behind the simulation approach.
<b>Course Name: Heat Transfer Lab</b>	
<b>Course Code: 18MEL67</b>	
<b>Course Index: C316</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C316.1	Conduct experiments to evaluate thermal properties of thermal equipment.
C316.2	Analyse the theoretical and experimental concept in heat transfer devices.
C316.3	Discuss the basic principle of heat transfer devices.



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<b>Course Name: Mini-project</b>	
<b>Course Code: 18MEM68</b>	
<b>Course Index: C317</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C317.1</b>	Identify and interpret the realistic mechanical engineering problems and related systems.
<b>C317.2</b>	Apply the basic principles and concepts of mechanical engineering in real world systems based on professional ethics and responsibilities
<b>C317.3</b>	Criticize and experiment to achieve optimum solutions for mechanical engineering problems.
<b>C317.4</b>	Analyse, evaluate and review the obtained solution for problems in mechanical engineering systems.
<b>C317.5</b>	Demonstrate professionalism with ethics; present effective communication skills and relate engineering issues to broader societal context
<b>Course Name: Control Engineering</b>	
<b>Course Code: 18ME71</b>	
<b>Course Index: C401</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C401.1</b>	Recognize control system, control actions and determine the system governing equations for physical models(Electrical, Thermal, Mechanical, Electro Mechanical)
<b>C401.2</b>	Estimate the response and error in response of first and second order systems subjected standard input signals.
<b>C401.3</b>	Calculate the Gain/Transfer Function of the system using Block Diagram and Signal Flow Graph.



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C401.4	Analyse a linear feedback control system for stability using Hurwitz criterion, Routh's criterion and root Locus technique in complex domain.
C401.5	Analyse the stability of linear feedback control system in Frequency Domain using Polar, Nyquist And Bode Plot.
<b>Course Name: Computer Aided Design and Manufacturing</b>	
<b>Course Code: 18ME72</b>	
<b>Course Index: C402</b>	
<b>Course Outcomes:</b> 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.
<b>Course Name: Total Quality Management</b>	
<b>Course Code: 18ME734</b>	
<b>Course Index: C403</b>	



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<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C403.1</b>	Explain the various approaches of TQM, TQM Framework, Quality Management Systems and about ISO9001 standards.
<b>C403.2</b>	Infer the characteristics of TQM leaders, ethics, the Deming philosophy and explain strategic planning communication, decision making
<b>C403.3</b>	Analyze customer perceptions of quality, Customer feedback systems. Customer retention, Employee Involvement, performance appraisal, Motivation.
<b>C403.4</b>	Apply statistical tools for continuous improvement of systems and processes using the various charts and diagram in quality management
<b>C403.5</b>	Understand and Apply the tools and techniques such as Total Productive Maintenance (TPM), Quality by Design (QbD), Environmental Management Systems (EMS) for effective implementation of TQM.
<b>Course Name: Project Management</b>	
<b>Course Code: 18ME745</b>	
<b>Course Index: C404</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
<b>C404.1</b>	Understand the selection, Prioritization and initiation of individual projects and strategic role of project management
<b>C404.2</b>	Understand the work breakdown structure by integrating it with organization. Understand the scheduling and uncertainty in projects
<b>C404.3</b>	Understand resourcing the projects and the risk management planning using Project tools
<b>C404.4</b>	Understand the activities like purchasing, acquisitions, contracting, partnering and collaborations related to performing projects. Determine the project progress and results through balanced scorecard approach



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C404.5	Draw the network diagram to calculate the duration of the project and reduce it using crashing.
<b>Course Name: Energy and Environment</b>	
<b>Course Code: 18ME751</b>	
<b>Course Index: C405</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C405.1	Summarize the basic concepts of energy, its distribution and general Scenario.
C405.2	Explain different energy storage systems, energy management, audit and economic analysis.
C405.3	Summarize the environment eco system and its need for awareness.
C405.4	Identify the various types of environment pollution and their effects.
C405.5	Discuss the social issues of the environment with associated acts.
<b>Course Name: Computer Integrated Manufacturing Lab</b>	
<b>Course Code: 18MEL76</b>	
<b>Course Index: C406</b>	
<b>Course Outcomes:</b> 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	Execute 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).

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C406.3	Understand and discuss the syntax of the part program.
<b>Course Name: Design Lab</b>	
<b>Course Code: 18MEL77</b>	
<b>Course Index: C407</b>	
<b>Course Outcomes: At the end of the course the student will be able to</b>	
C407.1	Conduct experiments to evaluate the design characteristics of various machine elements subjected to various loading.
C407.2	Analyse the theoretical and experimental concept in machine elements subjected to various loading.
C407.3	Understand and discuss the design characteristics of various systems subjected to mechanical loading.
<b>Course Name: Project Work Phase - 1</b>	
<b>Course Code: 18MEP78</b>	
<b>Course Index: C408</b>	
<b>Course Outcomes: At the end of the course the student will be able to</b>	
C408.1	Identify and interpret the realistic mechanical engineering problems and related systems.
C408.2	Apply the basic principles and concepts of mechanical engineering in real world systems based on professional ethics and responsibilities
C408.3	Criticize and experiment to achieve optimum solutions for mechanical engineering problems.
C408.4	Analyse, evaluate and review the obtained solution for problems in mechanical engineering systems.



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C408.5	Demonstrate professionalism with ethics; present effective communication skills and relate engineering issues to broader societal context
<b>Course Name: Energy Engineering</b>	
<b>Course Code: 18ME81</b>	
<b>Course Index: C409</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C409.1	Understand the operation, working and components of steam power plant
C409.2	Understand the operation, working and components of diesel power plant
C409.3	Understand the basic concepts of solar radiation and analyze the working of solar PV and thermal systems.
C409.4	Understand principles of energy conversion from alternate sources including wind and tide.
C409.5	Describe energy conversion method from bio gas and other green energy sources
<b>Course Name: Tribology</b>	
<b>Course Code: 18ME822</b>	
<b>Course Index: C410A</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C410A.1	Understand the fundamentals of tribology and the basic principles of lubrication.
C410A.2	Apply the concepts of tribology to understand the friction theories and wear characteristics.
C410A.3	Apply the principles of tribology to analyse the load carrying capacity of hydrodynamic journal bearings and idealized journal bearings



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C410A.4	Apply the principles of tribology to analyse the load carrying capacity of plane slider bearing and hydrostatic step bearings
C410A.5	Apply the principles of surface engineering for different applications of tribology
<b>Course Name: Automobile Engineering</b>	
<b>Course Code: 18ME824</b>	
<b>Course Index: C410B</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C410B.1	Describe and analyse different parts of an automobile and it's working
C410B.2	Analyse the working principles of transmission and braking systems
C410B.3	To comprehend the working of steering and suspension systems
C410B.4	To understand various types of fuels and injection systems.
C410B.5	To know the cause of automobile emissions, its effects on environment and methods to reduce the emissions
<b>Course Name: Project Work Phase - 2</b>	
<b>Course Code: 18MEP83</b>	
<b>Course Index: C411</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C411.1	Identify and interpret the realistic mechanical engineering problems and related systems.
C411.2	Apply the basic principles and concepts of mechanical engineering in real world systems based on professional ethics and responsibilities
C411.3	Criticize and experiment to achieve optimum solutions for mechanical engineering problems.



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C411.4	Analyse, evaluate and review the obtained solution for problems in mechanical engineering systems.
C411.5	Demonstrate professionalism with ethics; present effective communication skills and relate engineering issues to broader societal context
<b>Course Name: Technical Seminar</b>	
<b>Course Code: 18MES84</b>	
<b>Course Index: C412</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C412.1	Identify recent technical topics from interested domains
C412.2	Aquire basic skills for performing literature survey.
C412.3	Improve their Presentation and Communication skills.
C412.4	Develop skills for preparing Technical report
<b>Course Name: Internship</b>	
<b>Course Code: 18MEI85</b>	
<b>Course Index: C413</b>	
<b>Course Outcomes:</b> At the end of the course the student will be able to	
C413.1	Demonstrate the application of knowledge and skill sets acquired from the course and workplace in the assigned job function/s
C413.2	Solve real life challenges in the workplace by analysing work environment and conditions, and selecting appropriate skill sets acquired from the course
C413.3	Communicate and collaborate effectively and appropriately with different professionals in the work environment through written and oral means;



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C413.4	Exhibit critical thinking and problem solving skills by analysing underlying issue/s to challenges
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NBA Coordinator

HOD - ME

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