

**GEETHANJALI INSTITUTE OF SCIENCE & TECHNOLOGY::NELLORE****Department of Electronics and Communication Engineering****Course Outcomes Summary AY:2020-21**

<b>Course Outcomes (II Year) 2020-21 I Sem</b>		
<b>Course Name: Complex Variables and Transforms - 19A54302</b>		
No	Course Outcome	Taxonomy
C211.1	Find the analytic functions using C-R equations, the image using conformal mapping and bi-linear transformation.	Apply
C211.2	Use Cauchy's theorem, Cauchy's integral formula and Cauchy's residues theorem to evaluate complex integration and expansion of complex function using Taylor's and Laurent's series.	Apply
C211.3	Define Laplace and inverse Laplace transforms of various functions and solve ordinary differential equations using Laplace transform.	Apply
C211.4	Determine Fourier series of periodic functions in a given interval and Parseval's formula-Complex form of Fourier series.	Apply
C211.5	Find the Fourier Transform of certain functions.	Understand
C211.6	Solve the difference equations using Z-Transforms.	Apply
<b>Course Name: Signals and Systems- 19A04301</b>		
No	Course Outcome	Taxonomy
C212.1	Analyze the periodic signals by applying Fourier series.	Analyze
C212.2	Apply Fourier transform to solve problems.	Apply
C212.3	Evaluate the Fourier transform of Discrete-time signals.	Evaluate
C212.4	Analyze filter characteristics and physical realization of LTI system.	Analyze
C212.5	Evaluate response of linear systems to known inputs by using Laplace transforms.	Evaluate
C212.6	Analyze the continuous-time and discrete-time signals and systems using Laplace and Z- transforms.	Analyze
<b>Course Name: Electronic Devices and Circuits -19A04302T</b>		
No	Course Outcome	Taxonomy
C213.1	Recognize the transport phenomena of the charge carriers in a semiconductor.	Understand
C213.2	Study the characteristics and operation of p-n junction diode.	Understand
C213.3	Study the characteristics operation and applications of Special Diodes	Understand
C213.4	Illustrate diode circuits for different applications such as rectifiers, clippers and clampers	Analyze
C213.5	Design various biasing circuits for BJT and FET	Create
C213.6	Compare the performance of various semiconductor devices	Evaluate
<b>Course Name: Probability Theory and Stochastic Process - 19A04303</b>		
No	Course Outcome	Taxonomy
C214.1	Explain the concepts of Probability and Random Variable.	Understand
C214.2	Illustrate operations on single Random Variable	Apply
C214.3	Interpret concepts of multiple Random Variable	Understand
C214.4	Examine operations on multiple Random Variable	Apply
C214.5	Analyze Temporal characteristics and Spectral characteristics of a Random Processes.	Analyze
C214.6	Evaluate the response of Linear Systems with random inputs	Evaluate
<b>Course Name: Digital Electronics and Logic Design - 19A04304</b>		
No	Course Outcome	Taxonomy
C215.1	Apply basic laws and De Morgan's theorems to simplify Boolean expressions	Apply
C215.2	Compare K- Map and Q-M methods of minimizing logic functions	Analyze
C215.3	Design various Combinational logic circuits	Create
C215.4	Design synchronous sequential circuits using flip flops and construct digital systems using components such as registers and counters	Create
C215.5	Describe functional differences between different types of RAM & ROM	Understand
C215.6	Compare bipolar and MOS logic families	Analyze

<b>Course Name: Electrical Technology - 19A02304T</b>		
<b>No</b>	<b>Course Outcome</b>	<b>Taxonomy</b>
<b>C216.1</b>	Acquire knowledge about the constructional details and principle of operation of dc machines.	<b>Analyze</b>
<b>C216.2</b>	Explain the working and classification of dc machines as generators and motors	<b>Understand</b>
<b>C216.3</b>	Acquire knowledge about testing and applications of dc machines	<b>Analyze</b>
<b>C216.4</b>	Explain about the constructional details, principle of operation, testing and applications of transformers.	<b>Understand</b>
<b>C216.5</b>	Acquire knowledge about the constructional details and principle of operation of three phase and single phase induction motors	<b>Analyze</b>
<b>C216.6</b>	Acquire knowledge about testing and applications of synchronous machines.	<b>Analyze</b>
<b>Course Name: Electronic Devices and Circuits Lab - 19A04302P</b>		
<b>No</b>	<b>Course Outcome</b>	<b>Taxonomy</b>
<b>C217.1</b>	Describe the use of RPS and CRO	<b>Understand</b>
<b>C217.2</b>	Recognize the characteristics and applications of basic electronic devices	<b>Understand</b>
<b>C217.3</b>	Observe the characteristics of electronic devices by plotting graphs	<b>Understand</b>
<b>C217.4</b>	Categorize the Characteristics of UJT, BJT, FET, and SCR	<b>Analyze</b>
<b>C217.5</b>	Design BJT, FET Amplifiers for Voltage Amplification	<b>Create</b>
<b>C217.6</b>	Simulation of all Electronic circuits in PSPICE /Multisim	<b>Analyze</b>
<b>Course Name: Basic Simulation Lab - 19A04305</b>		
<b>No</b>	<b>Course Outcome</b>	<b>Taxonomy</b>
<b>C218.1</b>	Understand the basic concepts of programming in SCILAB and explain use of built-in functions to perform assigned task.	<b>Understand</b>
<b>C218.2</b>	Generate signals and sequences, Input signals to the systems to perform various operations.	<b>Remember</b>
<b>C218.3</b>	Analyze signals using Fourier, Laplace and Z-transforms.	<b>Analyze</b>
<b>C218.4</b>	Compute Fourier transform of a given signal and plot its magnitude and phase spectrum.	<b>Apply</b>
<b>C218.5</b>	Verify Sampling theorem,	<b>Understand</b>
<b>C218.6</b>	Determine Convolution and Correlation between signals and sequences.	<b>Apply</b>
<b>Course Name: Electrical Technology Lab - 19A02304P</b>		
<b>No</b>	<b>Course Outcome</b>	<b>Taxonomy</b>
<b>C219.1</b>	Understand various characteristics of DC generators.	<b>Understand</b>
<b>C219.2</b>	Understand various characteristics of DC motors.	<b>Understand</b>
<b>C219.3</b>	Predetermine the efficiency and regulation of a 1- $\phi$ transformer.	<b>Analyze</b>
<b>C219.4</b>	Know power measurement in 3- $\phi$ circuits	<b>Analyze</b>
<b>C219.5</b>	Understand various characteristics of Induction motors.	<b>Understand</b>
<b>C219.6</b>	Understand various characteristics of Synchronous machines.	<b>Understand</b>
<b>Course Name: Biology For Engineers - 19A99302</b>		
<b>No</b>	<b>Course Outcome</b>	<b>Taxonomy</b>
<b>C2110.1</b>	Explain about cells and their structure and function. Different types of cells and basics for classification of living Organisms	<b>Understand</b>
<b>C2110.2</b>	Explain about biomolecules, their structure and function and their role in the living organisms. How biomolecules are useful in Industry	<b>Understand</b>
<b>C2110.3</b>	Briefly about human physiology	<b>Remember</b>
<b>C2110.4</b>	Explain about genetic material, DNA, genes and RNA how they replicate, pass and preserve vital information in living Organisms	<b>Understand</b>
<b>C2110.5</b>	Know about application of biological Principles in different technologies for the production of medicines and Pharmaceutical molecules through transgenic microbes, plants and animals.	<b>Understand</b>
<b>C2110.6</b>	Understand transgenic plants and animals and their production	<b>Understand</b>

<b>Course Outcomes (III Year) 2020-21 I Semester</b>		
<b>Course Name: COMPUTER ORGANIZATION- 15A04511</b>		
<b>NO</b>	<b>Course Outcome</b>	<b>Taxonomy</b>
C311.1	Identify functional units of a computer, bus structures and addressing modes	<b>Understand</b>
C311.2	Explain Arithmetic Micro operations, Logical Micro operations, and Shift Micro operations	<b>Understand</b>
C311.3	Design Hardwired Control unit and Micro programmed control unit	<b>Design</b>
C311.4	Identify Peripheral devices and Memory devices of a computer	<b>Understand</b>
C311.5	Explain Pipelined execution and instruction scheduling	<b>Understand</b>
C311.6	Explain Inter processor arbitration and Inter processor communication	<b>Understand</b>
<b>Course Name: ANTENNAS &amp; WAVE PROPAGATION - 15A04501</b>		
<b>NO</b>	<b>Course Outcome</b>	<b>Taxonomy</b>
C312.1	Describe the basic concepts of radiation, antenna definition and various radiation characteristics of thin Wire antenna.	<b>Understand</b>
C312.2	Analyze the characteristics and parameters of Loop, Yagi-Uda, Helical, Horn antennas for their design	<b>Analyze</b>
C312.3	Analyze the characteristics and parameters of Microstrip patch, Reflectors and Lens antennas for their design	<b>Analyze</b>
C312.4	Determine the characteristics of antenna array, estimate radiation pattern of BSA and EFA, pattern multiplication and binomial arrays	<b>Apply</b>
C312.5	Illustrate the requirements for antenna measurements setups, and describe the procedure for measurement	<b>Apply</b>
C312.6	Describe the EM wave propagation in different layers of atmosphere, estimate the required profiles	<b>Remember</b>
<b>Course Name: DIGITAL COMMUNICATION SYSTEMS - 15A04502</b>		
<b>NO</b>	<b>Course Outcome</b>	<b>Taxonomy</b>
C313.1	Explain the elements of Digital Communication Systems, the concepts of sampling theorem ,Source coding and modulation techniques.	<b>Understand</b>
C313.2	Summarizes baseband pulse transmission system	<b>Understand</b>
C313.3	Analyze probability of error in digital systems -PCM , DPCM and DM.	<b>Analyze</b>
C313.4	Solve problems on geometric representation of signals by applying Gram-Schmidt orthogonalization procedure and explain correlation receiver.	<b>Apply</b>
C313.5	Compare digital modulation techniques-BPSK,QPSK ,BFSK and M-ary systems.	<b>Analyze</b>
C313.6	Solve problems in linear block codes and design channel convolutional encoder	<b>Create</b>
<b>Course Name: LINEAR INTEGRATED CIRCUITS &amp; APPLICATIONS - 15A04503</b>		
<b>NO</b>	<b>Course Outcome</b>	<b>Taxonomy</b>
C314.1	Explain the basic building blocks of linear integrated circuits and its characteristics.	<b>Understand</b>
C314.2	Explain the different feedback amplifiers and frequency response of operational amplifier.	<b>Understand</b>
C314.3	Design linear applications of op-amp.	<b>Analyze</b>
C314.4	Design non-linear applications of op-amp.	<b>Analyze</b>
C314.5	Design oscillators and filters using operational amplifier.	<b>Analyze</b>
C314.6	Choose appropriate A/D and D/A converters for signal processing applications.	<b>Analyze</b>
<b>Course Name: DIGITAL SYSTEM DESIGN - 15A04504</b>		
<b>NO</b>	<b>Course Outcome</b>	<b>Taxonomy</b>
C315.1	Explain the CMOS, Bi-CMOS and TTL logic families and interfacing between them.	<b>Understand</b>
C315.2	Describe Programming concepts using VHDL hard ware description language	<b>Understand</b>

C315.3	Illustrate the digital system Design using hardware description language (VHDL).	<b>Apply</b>
C315.4	Design Combinational logic circuits with standard ICs using VHDL.	<b>Create</b>
C315.5	Design Sequential logic circuits with standard ICs using VHDL.	<b>Create</b>
C315.6	Design Barrel shifter, comparators, Encoders, Latches & flip flops, PLDs, counters, shift register using VHDL.	<b>Create</b>
<b>Course Name: MEMS &amp; MICRO SYSTEMS - 15A04506</b>		
<b>NO</b>	<b>Course Outcome</b>	<b>Taxonomy</b>
C316.1	Summarize the MEMS technology & microsystems	<b>Understand</b>
C316.2	Describe microelectronics & micro machining processes	<b>Understand</b>
C316.3	Describe various MEMS micro sensors ,their operating principles	<b>Understand</b>
C316.4	Analyzes MEMS accelerometer technology	<b>Analyze</b>
C316.5	Summarizes the applications of MEMS accelerometer	<b>Understand</b>
C316.6	Describe advanced MEMS applications & the state of art in MEMS & MICROSYSTEMS	<b>Understand</b>
<b>Course Name: IC APPLICATIONS LAB - 15A04507</b>		
<b>NO</b>	<b>Course Outcome</b>	<b>Taxonomy</b>
C317.1	Explain the significance of Op Amps, ASLK pro board and their applications.	<b>Understand</b>
C317.2	Design circuits using Analog system laboratory kit (ASLK) pro board trainers.	<b>Create</b>
C317.3	Define in-depth knowledge of applying the linear and nonlinear applications of op amps in real time applications.	<b>Understand</b>
C317.4	Analyze the OP Amp applications as summer, Subtractor, Multiplier, integrator, Voltage Regulator and multivibrators.	<b>Analyze</b>
C317.5	Generate various signal functions using ASLK pro board using TL081C Op Amp.	<b>Create</b>
C317.6	Design and explain the Analog to Digital conversion operation and vice versa.	<b>Create</b>
<b>Course Name: DIGITAL COMMUNICATION SYSTEMS LAB - 15A04508</b>		
<b>NO</b>	<b>Course Outcome</b>	<b>Taxonomy</b>
C318.1	Explain basic theories of Digital communication system in practical.	<b>Remember</b>
C318.2	Describe different techniques in modern digital communications, particular in source coding using MAT Lab tools.	<b>Understand</b>
C318.3	Determine the performance of different waveform coding techniques for the generation of a digital Representation of the signal.	<b>Apply</b>
C318.4	Analyze digital modulation techniques by using MATLAB tools.	<b>Analyze</b>
C318.5	Recommend to appreciate high signal to noise magnitude relation which uses one bit PCM code to appreciate digital transmission of analog signal.	<b>Evaluate</b>
C318.6	Design digital communication systems as per given specifications	<b>Create</b>
<b>Course Name: AUDIT COURSE – SOCIAL VALUES &amp; ETHICS - 15A99501</b>		
<b>NO</b>	<b>Course Outcome</b>	<b>Taxonomy</b>
C319.1	Discuss the ethical values and social context of problems	<b>Understand</b>
C319.2	Outline the social responsibilities of an engineer, rights and qualities of moral Leadership.	<b>Analyze</b>
C319.3	Explain philosophy of Life and Individual qualities	<b>Understand</b>
C319.4	Discuss the core values that shape the ethical behavior of an engineer.	<b>Understand</b>
C319.5	Develop appropriate technologies and management patterns to create harmony in professional and Personal life.	<b>Create</b>
C319.6	Outline environment conservation, enrichment and sustainability	<b>Analyze</b>

**Course Outcomes (IV Year) 2020-21 I Sem****Course Name: OPTICAL FIBER COMMUNICATIONS - 15A04701**

No	Course Outcome	Taxonomy
C411.1	Demonstrate the performance of both digital and analog optical fiber systems.	Apply
C411.2	Analyze the system bandwidth, noise, probability of error and maximum usable bit rate of digital fiber system.	Analyze
C411.3	Calculate the system link loss, distortion and dynamic range of an RF photonic link.	Apply
C411.4	Describe the various optical source materials, LED structure, quantum efficiency of laser diodes.	Understand
C411.5	Analyze the various optical Detectors materials, APD & PIN structure, quantum efficiency of Photo detector.	Create
C411.6	Evaluate characteristics of fiber sources and detectors, as well as conduct experiment in software and hardware, and analyze the results to provide valid conclusions.	Evaluate

**Course Name: EMBEDDED SYSTEMS - 15A04702**

No	Course Outcome	Taxonomy
C412.1	Summarize the fundamental concepts of Embedded systems.	Create
C412.2	Design of embedded systems leading to 32-bit application development.	Understand
C412.3	Explain the hardware-interfacing concepts to connect digital as well as analog sensors while ensuring low power considerations.	Create
C412.4	Formulate and design the protocols used by microcontroller to communicate with external sensors in real world.	Understand
C412.5	Describe Embedded Networking and IoT concepts based upon connected MCUs.	Understand
C412.6	Analyze and Develop embedded hardware and software development cycles and tools.	Analyze

**Course Name: MICROWAVE ENGINEERING - 15A04703**

No	Course Outcome	Taxonomy
C413.1	Analyse TM/TE modes and characteristics of EM wave while propagating through rectangular wave guide and cavity resonator.	Analyse
C413.2	Describe the basic microwave components and ferrite devices like gyrator, isolator and circulator.	Understand
C413.3	Illustrate the two-cavity klystron amplifier, reflex klystron oscillator and TWT amplifier.	Apply
C413.4	Describe the Magnetron oscillator, IMPATT, TRAPATT, BARITT and GUNN diodes.	Understand
C413.5	Illustrate the methods for measuring microwave parameters like attenuation, power, impedance, VSWR, frequency etc.,	Apply
C413.6	Derive the Scattering matrix of E-Plane Tee, H-Plane Tee, Magic Tee, Directional Coupler, Isolator and Circulator.	Create

**Course Name: DATA COMMUNICATIONS AND NETWORKING - 15A04704**

No	Course Outcome	Taxonomy
C414.1	Tabulate the functions of different layers in the OSI model and TCP/IP suite.	Remember
C414.2	Summarize the flow control and error control techniques to provide end-to-end delivery.	Understand
C414.3	Apply controlled access protocols which allows all users to coexist and use the entire bandwidth at the same time.	Apply
C414.4	Analyze short range and long-range wireless technologies.	Analyze
C414.5	Choose the proper Routing protocols used to distribute data to multiple recipients.	Evaluate
C414.6	Set up a simple network that can use several IP address ranges.	Create

<b>Course Name: RADAR SYSTEMS - 15A04705</b>		
<b>No</b>	<b>Course Outcome</b>	<b>Taxonomy</b>
<b>C415.1</b>	Illustrate Range Performance using false alarm time by integration of radar pulses with radar range equation.	<b>Evaluate</b>
<b>C415.2</b>	Explain CW-FM Radar-Block Diagram with Non-zero IF Receiver and bandwidth requirements.	<b>Understand</b>
<b>C415.3</b>	Analyze the concept of MTI radar & Doppler effect using filters with blind speeds and staggered prf's.	<b>Analyze</b>
<b>C415.4</b>	Describe various tracking radar systems with Acquisition and Scanning Patterns.	<b>Remember</b>
<b>C415.5</b>	Identify radar signals using Matched Filter with Non-white Noise with the help of Correlation Function and Cross-correlation Receiver.	<b>Remember</b>
<b>C415.6</b>	Discuss phase array antennas and basic concepts of radiation pattern along with applications and limitations.	<b>Understand</b>
<b>Course Name: DIGITAL IMAGE PROCESSING - 15A04708</b>		
<b>No</b>	<b>Course Outcome</b>	<b>Taxonomy</b>
<b>C416.1</b>	Describe the image processing concepts and apply them for engineering and real time applications.	<b>Understand</b>
<b>C416.2</b>	Use the skills to develop new image processing techniques to process images of any context through image transforms.	<b>Apply</b>
<b>C416.3</b>	Differentiate image enhancement techniques in spatial domain as well as frequency domain.	<b>Understand</b>
<b>C416.4</b>	Categorize image restoration techniques for image processing applications.	<b>Analyse</b>
<b>C416.5</b>	Infer image segmentation techniques for image processing applications.	<b>Analyse</b>
<b>C416.6</b>	Describe the image processing concepts and apply them for engineering and real time applications.	<b>Understand</b>
<b>Course Name: MICROWAVE &amp; OPTICAL COMMUNICATIONS LAB - 15A04711</b>		
<b>No</b>	<b>Course Outcome</b>	<b>Taxonomy</b>
<b>C417.1</b>	Demonstrate the characteristics of Microwave sources.	<b>Apply</b>
<b>C417.2</b>	Demonstrate the characteristics of directional Couplers.	<b>Analyze</b>
<b>C417.3</b>	To test the characteristics of microwave components.	<b>Evaluate</b>
<b>C417.4</b>	To analyze the radiation pattern of antenna.	<b>Analyze</b>
<b>C417.5</b>	To measure antenna gain.	<b>Apply</b>
<b>C417.1</b>	Practice microwave measurement procedures.	<b>Apply</b>
<b>Course Name: VLSI &amp; EMBEDDED SYSTEMS LAB - 15A04712</b>		
<b>No</b>	<b>Course Outcome</b>	<b>Taxonomy</b>
<b>C418.1</b>	Design and simulation of Combinational circuit with functional verification.	<b>Create</b>
<b>C418.2</b>	Design and simulation of Sequential circuit with functional verification.	<b>Create</b>
<b>C418.3</b>	Generate Synthesis report for both combinational and sequential circuits	<b>Create</b>
<b>C418.4</b>	Explain the configuration of the FPGA Spartan 3e Hardware using debug cable.	<b>Understand</b>
<b>C418.5</b>	Design and simulate the operations of systems using CC Studio software and study the different modes of operations.	<b>Understand</b>
<b>C418.6</b>	Explain the configuration of the embedded controller TIVA TM4C series using USB serial cable.	<b>Understand</b>



**GEETHANJALI INSTITUTE OF SCIENCE & TECHNOLOGY::Nellore**  
**Department of Electrical and Electronics Engineering**

**Course Outcomes**

CAY : 2020-21	REG : R19		Year /Sem: II -I
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SNO	Course Outcome Statement	Taxonomy
<b>SPECIFIC LEARNING OUTCOMES – Complex Variables &amp; Transforms</b>		
C211.1	Find the analytic functions using C-R equations, the image using conformal mapping and bi-linear transformation.	Apply
C211.2	Use Cauchy's theorem, Cauchy's integral formula and Cauchy's residues theorem to evaluate complex integrations and expansion of complex functions using Taylor's and Laurent's series.	Apply
C211.3	Define Laplace and inverse Laplace transforms of various functions and solve ordinary differential equations using Laplace transform.	Apply
C211.4	Determine Fourier series of periodic functions in a given interval and Parseval's formula- Complex form of Fourier series.	Apply
C211.5	Find the Fourier Transform of certain functions.	Understand
C211.6	Solve the difference equations using Z-Transforms.	Apply
<b>SPECIFIC LEARNING OUTCOMES – Basic Electrical Circuits</b>		
C212.1	Explain types of networks and Network Reduction Techniques	Understand
C212.2	Analyze Magnetic Circuits and Coupled circuits.	Analyse
C212.3	Analyze RLC circuits with AC Excitation	Analyse
C212.4	Apply theorems for finding the solutions of network problems	Analyse
C212.5	Analyse three phase balanced and unbalanced circuits and determine line voltages, line currents, phase voltages and phase currents	Analyse
C212.6	Analysis of electrical networks using graph theory and duality and dual networks	Analyse
<b>SPECIFIC LEARNING OUTCOMES – Power System Architecture</b>		
C213.1	Remember and understand the concepts of conventional and nonconventional power generating systems	Remember
C213.2	Apply the economic aspects to the power generating systems.	Apply
C213.3	Analyse the transmission lines and obtain the transmission line parameters and constants.	Analyse
C213.4	Design and Develop the schemes to improve the generation and	Create

	capability of transmission line to meet the day to day power requirements.	
C213.5	Design of Distribution Feeders, Voltage Drop and power loss in A.C. Distributors.	Create
C213.6	Explain different types of Substations, Various arrangements in Substations	Remember
<b>SPECIFIC LEARNING OUTCOMES – DC Machines &amp; Transformers</b>		
C214.1	Able to Understand the concepts of magnetic circuits.	Understand
C214.2	Able to understand the construction, operation and armature windings of a DC generator	Understand
C214.3	Able to understand the operation of a DC motors.	Understand
C214.4	Able to analyze speed control of DC motors, testing methods and parallel operation of DC machines	Analyze
C214.5	Able to predetermine the efficiency and regulation of a transformer	Apply
C214.6	Analyse single phase and three phase transformers circuits.	Analyze
<b>SPECIFIC LEARNING OUTCOMES – Semiconductor Devices and Circuits</b>		
C215.1	Describe the Working of P-N junction diode and its applications	Understand
C215.2	Interpret the characteristics of special purpose diodes	Understand
C215.3	Explain different configurations of BJT and its biasing	Understand
C215.4	Analyse the transistor amplifier using hybrid parameters	Analyse
C215.5	Compare the low frequency BJT amplifier circuits	Analyse
C215.6	Classify the characteristics of FET's ,biasing and small signal modelling	Analyse
<b>SPECIFIC LEARNING OUTCOMES – Digital Electronics and Logic Design</b>		
C216.1	Apply basic laws and De Morgan's theorems to simplify Boolean expressions	Apply
C216.2	Compare K- Map and Q-M methods of minimizing logic functions	Analyze
C216.3	Design various Combinational logic circuits	Create
C216.4	Design synchronous sequential circuits using flip flops and construct digital systems using components such as registers and counters	Create
C216.5	Describe functional differences between different types of RAM & ROM	Understand
C216.6	Compare bipolar and MOS logic families	Analyze
<b>SPECIFIC LEARNING OUTCOMES – DC Machines &amp; Transformers Lab</b>		
C217.1	Able to conduct and analyze load test on DC generators	Apply
C217.2	Able to understand and analyze magnetization characteristics of DC shunt Generator	Understand
C217.3	Able to understand and analyze speed control techniques of DC machines	Understand
C217.4	Able to understand and analyze efficiency of DC machines by	Understand



	direct method	
C217.5	Able to understand and analyze efficiency of DC machines by indirect method.	Understand
C217.6	Able to understand to predetermine efficiency and regulation of single phase Transformers	Understand
<b>SPECIFIC LEARNING OUTCOMES – Semiconductor Devices and Circuits Lab</b>		
C218.1	Working operation of various diodes and its applications	Understand
C218.2	Working operation of BJT configurations	Understand
C218.3	Construct and evaluate the performances of FET and UJT	Create
C218.4	Design Simple rectifier circuits	Create
C218.5	Design amplifier to prove Miller's and dual of Miller's theorem	Create
C218.6	Design BJT, FET Amplifiers for Voltage Amplification	Create
<b>SPECIFIC LEARNING OUTCOMES – Basic Electrical Circuits Lab</b>		
C219.1	Explain network elements and types of networks	Apply
C219.2	Apply theorems for finding the solutions of network problems	Apply
C219.3	Apply Maximum power transfer theorems for finding the solutions of DC & AC Networks	Apply
C219.4	Analyze RLC circuits and coupled circuits.	Analyse
C219.5	Understand 3 phase balanced and unbalanced, star and delta connected supply and load	Understand
C219.6	Measure reactive power in 3-phase circuit using different methods	Apply
<b>SPECIFIC LEARNING OUTCOMES – Biology for engineers</b>		
C2110.1	Explain Different types of cells and basics for classification of living Organisms.	Understand
C2110.2	Explain about biomolecules, their structure and function and their role in the living organisms and How biomolecules are useful in Industry	Understand
C2110.3	Briefly about human physiology	Understand
C2110.4	Explain about genetic material, DNA, genes and RNA how they replicate, pass and preserve vital information in living Organisms	Understand
C2110.5	Know about application of biological Principles in different technologies for the production of medicines	Understand
C2110.6	Understand Pharmaceutical molecules through transgenic microbes, plants and animals	Understand

Coordinator

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**Department of Electrical and Electronics Engineering**

**Course Outcomes**

CAY : 2020-21	SEM : I		Year : III
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SNO	Course Outcome Statement	Taxonomy
<b>SPECIFIC LEARNING OUTCOMES – Electrical Measurements</b>		
C311.1	Use watt meters, pf meters, and energy meters in a given circuit	Apply
C311.2	Calculate and Extend the range of ammeters and voltmeters	Analyse
C311.3	Measure active power, reactive power, power factor, and energy in both 1-phase and 3-phase circuits	Evaluate
C311.4	Determine the resistance values of various ranges, L and C values using appropriate bridges	Apply
C311.5	Analyse the different characteristic features of periodic, and a periodic signals using CRO	Analyse
C311.6	Use CTs and PTs for measurement of very large currents and high voltages	Apply
<b>SPECIFIC LEARNING OUTCOMES – Linear &amp; Digital IC Applications</b>		
C312.1	Explain the basic building blocks of Linear Integrated Circuits and its Characteristics.	Understand
C312.2	Analyze the Linear, Non-Linear and specialized applications of Operational Amplifiers	Analyse
C312.3	Analyze the operation Of ADC, DAC ,Waveform Generators And their design.	Analyse
C312.4	Describe Digital Logic families and their applications.	Understand
C312.5	Analyze various Combinational And Sequential Circuit Designs.	Analyse
C312.6	Design various Combinational And Sequential Circuits .	apply
<b>SPECIFIC LEARNING OUTCOMES – Electrical Power Transmission Systems</b>		
C313.1	Compute the transmission line parameters	Apply
C313.2	Model a given transmission line	Create
C313.3	Estimate the performance of a given transmission line	Evaluate
C313.4	Analyse the effect of over voltages on transmission lines	Analyse
C313.5	Explain the construction, types and grading of underground cables and analyze cable performance	Understand
C313.6	Calculate sag /tension of transmission line and performance of line insulators	Apply
<b>SPECIFIC LEARNING OUTCOMES – Power Electronics</b>		
C314.1	Understand the basics of power electronic devices	Understand
C314.2	Express the construction and control of rectifiers	Apply
C314.3	Evaluate power electronics converters in power control application	Evaluate
C314.4	Express the design and control of inverters	Analyse
C314.5	Ability to model chopper circuits	Apply
C314.6	Ability to design AC voltage controller and cyclo converter	Evaluate

<b>SPECIFIC LEARNING OUTCOMES – Electrical Machines – III</b>		
C315.1	Understand the working principle of synchronous machines	Understand
C315.2	Predetermine the regulation of synchronous generator using different methods	Apply
C315.3	Determine how several alternators running in parallel share the load on the system	Apply
C315.4	Analyze the performance characteristics of synchronous motor	Analyse
C315.5	Make necessary calculations for power factor improvement using synchronous condenser	Evaluate
C315.6	Choose specific single phase motor and special motor for a given application	Analyse
<b>SPECIFIC LEARNING OUTCOMES – Networks Signals and Systems</b>		
C316.1	Apply the knowledge of basic circuit law and simplify the network using reduction techniques	Apply
C316.2	Understand the features of two port networks and to obtain their equivalent circuits	Apply
C316.3	Analyse the frequency response of electrical network using Laplace transform	Analyse
C316.4	Apply principles and concepts of graph theory in practical situations	Apply
C316.5	Apply concepts of Fourier series to simplify the electrical network	Apply
C316.6	Synthesize the network using network functions	Evaluate
<b>SPECIFIC LEARNING OUTCOMES – Electrical Machines Laboratory – II Laboratory</b>		
C317.1	Analyze characteristics of transformers with different loads.	Analyse
C317.2	Predetermine the efficiency of the transformer and fix the rating of transformers by identifying the equivalent circuit parameters.	Apply
C317.3	Determine the voltage regulation on testing alternators with the different load.	Apply
C317.4	Determine the efficiency with performance characteristics of slip ring induction motor by brake test.	Apply
C317.5	Predetermine the efficiency of the single phase and three phase squirrel cage induction Motor with the no load and blocked rotor test.	Apply
C317.6	Analyze the performance characteristics of Synchronous motors with different excitation.	Analyse
<b>SPECIFIC LEARNING OUTCOMES – Electrical Measurements Laboratory</b>		
C318.1	Calibrate various electrical measuring/recording instruments	Evaluate
C318.2	Determine ratio error and phase angle error of CT	Apply
C318.3	Accurately determine the values of inductance and capacitance using a.c bridges	Understand
C318.4	Accurately determine the values of very low resistances	Apply
C318.5	Analysis based on comparing true and actual value of potentiometer and power factor meter.	Analyse
C318.6	Measure reactive power in 3-phase circuit using single wattmeter	Evaluate
<b>SPECIFIC LEARNING OUTCOMES – Audit course – Social Values &amp; Ethics</b>		
C319.1	Discuss the ethical values and social context of problems	Understand

C319.2	Outline the social responsibilities of an engineer, rights and qualities of moral Leadership.	Analyze
C319.3	Explain philosophy of Life and Individual qualities	Understand
C319.4	Discuss the core values that shape the ethical behavior of an engineer.	Understand
C319.5	Develop appropriate technologies and management patterns to create harmony in professional and personal life.	Create
C319.6	Outline environment conservation, enrichment and sustainability	Analyze

Coordinator

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## GEETHANJALI INSTITUTE OF SCIENCE & TECHNOLOGY::NELLORE

### Department of Electrical and Electronics Engineering

#### Course Outcomes

CAY : 2020-21	SEM : I		Year : IV
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SNO	Course Outcome Statement	Taxonomy
<b>SPECIFIC LEARNING OUTCOMES – Electrical Distribution Systems</b>		
C411.1	Analyse the classification of distribution systems	Analyse
C411.2	Analyse the technical aspects and design considerations in DC and AC distribution systems and their comparison	Analyse
C411.3	Evaluate voltage drop and line loss calculations and voltage regulating equipment to improve the power factor and voltage profile.	Evaluate
C411.4	Analyse Technical issues of substations such as location, ratings and bus bar arrangements	Analyse
C411.5	Determine the causes of low power factor and methods to improve power factor	Apply
C411.6	Contrast principles in Distribution automation	Apply
<b>SPECIFIC LEARNING OUTCOMES – Digital Signal Processing</b>		
C412.1	Classify various types of discrete time signals and systems	UNDERSTAND
C412.2	Use discrete Fourier Transforms (DFT) to a processing system to give the desired output.	APPLY
C412.3	Determine FFT algorithms in rapid frequency-domain analysis.	APPLY
C412.4	Analyse IIR and FIR filters using different structures	Analyse
C412.5	Design digital filters to meet specific magnitude and phase requirements	Create
C412.6	Illustrate multirate DSP techniques for various applications of DSP by sampling rate conversion.	APPLY
<b>SPECIFIC LEARNING OUTCOMES – Power System Operation and Control</b>		
C413.1	Design an optimal operation setup of power system which minimizes operation costs and meet desired needs.	Create
C413.2	To allow students to illustrate about thermal and hydro power plants operation in meeting the load demand optimally.	Analyze
C413.3	Ability to discuss single area load frequency control and two area load frequency control.	Understand
C413.4	Apply the techniques to control power flows, frequency and voltage	Apply
C413.5	Differentiate pricing mechanism of electric energy and trading of power under deregulated environment.	Understand
C413.6	Assess the significance of power system restructuring and learn the Security Analysis, Contingency Analysis.	Evaluate

<b>SPECIFIC LEARNING OUTCOMES – Utilization of Electrical Energy</b>		
C414.1	Examine the laws of illumination and their application for various lighting schemes.	Apply
C414.2	Analyse the Principles and methods of electric heating and welding.	Analyse
C414.3	Describe the Systems of electric traction and study of traction equipment.	Understand
C414.4	Explain mechanics of Train movement and associated calculations.	Understand
C414.5	Ability to choose the better equipment with consideration of economic aspects.	Evaluate
C414.6	Evaluate the losses and efficiency of the electrical equipments used in various industries	Evaluate
<b>SPECIFIC LEARNING OUTCOMES – Energy Auditing &amp; Demand Side Management</b>		
C415.1	Understand global energy scenario and energy auditing concepts	Understand
C415.2	Carry out energy audit in motor and power factor improvement techniques to convert it as energy efficient motors.	Apply
C415.3	Determine efficient lighting system with the lighting energy audit.	Apply
C415.4	Choose specific energy instruments for energy auditing.	Analyze
C415.5	Select the suitable techniques of demand side management for energy conservation awareness program.	Analyze
C415.6	Evaluate the techno economic feasibility of the energy conservation technique adopted.	Evaluate
<b>SPECIFIC LEARNING OUTCOMES – Power Quality</b>		
C416.1	Address power quality issues to ensure meeting of standards	Understand
C416.2	Apply the concepts of compensation for sags and swells using voltage regulating devices	Apply
C416.3	Assess harmonic distortion and its mitigation	Evaluate
C416.4	Evaluate All Parameters Of Electrical Circuits.	Evaluate
C416.5	Explain the power measurement data according to standards	Understand
C416.6	Evaluate the Power quality with the suitable tool for reliable electrical distribution system.	Evaluate
<b>SPECIFIC LEARNING OUTCOMES – Digital Signal Processing Laboratory</b>		
C417.1	Experiment concepts of DSP and its applications using MATLAB Software	Analyze
C417.2	Express about the basic signal generation	Understand
C417.3	Examine Fourier Transform Concepts	Apply
C417.4	Design FIR filters	Create
C417.5	Design IIR filters.	Create
C417.6	Demonstrate their abilities towards DSP processor based implementation of DSP systems.	Apply

<b>SPECIFIC LEARNING OUTCOMES – Power Systems &amp; Simulation Laboratory</b>		
C418.1	Determination of sequence impedance and sub transient reactance of synchronous machine	Apply
C418.2	Conduct experiments to analyze LG, LL, LLG, LLLG faults	Analyse
C418.3	Estimate the parameters of three winding transformer equivalent circuit	Evaluate
C418.4	Develop MATLAB program for formation of Y and Z buses	Create
C418.5	Develop MATLAB programs for gauss-seidel and fast decoupled load flow studies.	Create
C418.6	Develop the SIMULINK model for single area load frequency control problem	Create

Coordinator

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AY : 2020-21		II YEAR- I Sem	
On successful completion of this course the students will be able:			
CO. NO	Course Outcomes	Taxonomy	
<b>SPECIFIC LEARNING OUTCOMES – Complex Variables, Transforms and PDE (19A54301 )</b>			
C211.1	To Find the analytic functions using C-R equations, the image using conformal mapping and bi-linear transformation.	Apply	
C211.2	To Use Cauchy's theorem, Cauchy's integral formula and Cauchy's residues theorem to evaluate complex integrations and expansion of complex functions using Taylor's and Laurent's series.	Apply	
C211.3	To Define Laplace and inverse Laplace transforms of various functions and solve ordinary differential equations using Laplace transform.	Apply	
C211.4	To Determine Fourier series of periodic functions in a given interval and Parseval's formula- Complex form of Fourier series.	Apply	
C211.5	To Construct the partial differential equations and solve first order and second order PDEs by Lagrange's method and method of separation of variables respectively	Apply	
C211.6	To Solve one dimensional wave, heat and Laplace equations.	Apply	
<b>SPECIFIC LEARNING OUTCOMES – Strength of Materials-I (19A01301T)</b>			
C211.1	To Understand the different types of couples and force system	Understand	
C211.2	To Design the various failures occur in the structure by shear & bending forces	Create	
C211.3	To Understand the concept of the stress, strain, generalized hooke's law	Understand	
C211.4	To Understand the concept of elastic moduli and strain energy	Understand	
C211.5	To Develop shear force and bending moment diagrams for different load cases	Create	
C211.6	To Understand the flexural stresses and shear stresses for different loading cases.	Understand	
<b>SPECIFIC LEARNING OUTCOMES – Fluid Mechanics (19A01302T)</b>			
C212.1	To Understand the principles of fluid statics, kinematics and dynamics.	Understand	
C212.2	To Understand the basic terms used in fluid mechanics	Understand	
C212.3	To Understand the flow characteristics and classify the flows	Understand	
C212.4	To Apply the continuity & momentum principles.	Apply	
C212.5	To Apply the energy principles of fluid flows	Apply	
C212.6	To Estimate various losses in flow through channels	Evaluate	
<b>SPECIFIC LEARNING OUTCOMES – Surveying (19A01303T)</b>			
C213.1	To Calculate angles, distance and levels on ground surface	Apply	
C213.2	To Identify data collection methods and prepare field notes	Remember	
C213.3	To Understand the working principles of surveying instruments	Remember	
C213.4	To Estimate the volumes of earthwork	Evaluate	
C213.5	To Use modern survey instruments	Apply	
C213.6	To Apply basic principles of EDM instruments	Apply	
<b>SPECIFIC LEARNING OUTCOMES – Building Materials and Construction (19A01304)</b>			
C214.1	To Understand the characteristics of various building materials such as stones and clay	Understand	
C214.2	To Evaluate the properties of binding materials in suitability of building constructions.	Evaluate	



C214.3	To Determine the Characteristics of steel by conducting various tests.	Apply
C214.4	To Understand the construction procedure of various types of floorings.	Understand
C214.5	To Understand the components of doors and windows.	Understand
C214.6	To Understand the installation of electrical, sanitary and plumbing fittings in buildings.	Understand
<b>SPECIFIC LEARNING OUTCOMES – Python Programming (19A05304T)</b>		
C216.1	To Apply the basic concepts, modular approach to solve the problems.	Apply
C216.2	To Design the programs using conditional execution, recursion, built in functions, turtle	Create
C216.3	To Design programs to manipulate strings	Create
C216.4	To Apply python programs to read and write data from/to files.	Apply
C216.5	To Design the programs by choosing appropriate data structures like lists, dictionaries, tuples.	Create
C216.6	To Apply object oriented programming concepts	Apply
<b>SPECIFIC LEARNING OUTCOMES – Universal Human Values (19A52301)</b>		
C211.1	To Discuss the concept value-education in individual's life for happiness & prosperity	Understand
C211.2	To Explain the term self-exploration and its application for self-evaluation and development.	Understand
C211.3	To Discuss the importance of values in human relationships	Understand
C211.4	To Explain the holistic perception of harmony at level of self, family, society and nature.	Understand
C211.5	To Outline the co-existence of nature and human being	Analyze
C211.6	To Use professional ethics in their future profession for making a value-based society	Apply
<b>SPECIFIC LEARNING OUTCOMES – Strength of Materials Laboratory (19A01301P)</b>		
C217.1	To Differentiate the Mechanical properties of Materials through various tests	Understand
C217.2	To Interpret the material properties under different stress and strain conditions.	Understand
C217.3	To Predict the engineering properties of materials by using Hardness Test.	Apply
C217.4	To Calculate the Compressive and Tensile stresses of the material by using UTM.	Apply
C217.5	To Understand the Concepts of Shear Test and Impact Test on Materials.	Understand
C217.6	To Calculate the Deflection for Continuous beam by using Deflection test.	Apply
<b>SPECIFIC LEARNING OUTCOMES –Fluid Mechanics Lab (19A01302P )</b>		
C212.1	To Determine the fluid flow principles in orifice and Venturimeter	Apply
C212.2	To Calculate Coefficient of discharge for a small orifice by a constant head method	Analyze
C212.3	To Analyse the Calibration of contracted Rectangular Notch and /or Triangular Notch	Analyze
C212.4	To Determine Coefficient of loss of head in a sudden contraction and friction factor	Analyze
C212.5	To Understand the Study of Hydraulic jump at various points	Remember
C212.6	To Determine the Efficiency test on Centrifugal Pump.	Apply
<b>SPECIFIC LEARNING OUTCOMES – Surveying Laboratory - (19A01303P)</b>		

C213.1	To Evaluate the survey and to collect field data	Evaluate
C213.2	To Prepare field notes from survey data	Create
C213.3	To Interpret survey data and compute areas and volumes	Understand
C213.4	To Identify the various measurements	Remember
C213.5	To Interpret the data which can be collected in the site	Understand
C213.6	To Analyse the Total Station for various measurements	Analyse

AY : 2020-21		III YEAR- I Sem
On successful completion of this course the students will be able:		
S NO	Course Outcomes Statement	Taxonomy
<b>SPECIFIC LEARNING OUTCOMES – Design and Drawing of RCC structures(15A01501 )</b>		
C311.1	To Recognize the design philosophies of reinforced concrete structures	Understand
C311.2	To Apply the principles, procedures and current code requirements to analysis and design of reinforced concrete beams	Apply
C311.3	To Identify the behavior of reinforced concrete members in bond, anchorage, shear and torsion	Remember
C311.4	To Analyse and design reinforced concrete compression members.	Analyse
C311.5	To Analyse the load on the structure and design the footings	Analyse
C311.6	To Design combined column footing.	Create
<b>SPECIFIC LEARNING OUTCOMES – Estimation, Costing and Valuation (15A01502 )</b>		
C312.1	To Apply different types of estimates for different building elements.	Apply
C312.2	To Analyse the rates and bill preparation different building elements	Analyse
C312.3	To Prepare the concepts of specification writing	Create
C312.4	To Estimate different volumes of earthwork	Evaluate
C312.5	To Compare the difference between contractors and tenders	Evaluate
C312.6	To Estimate the valuation of assets	Evaluate
<b>SPECIFIC LEARNING OUTCOMES –Geotechnical Engineering I(15A01503 )</b>		
C313.1	To Differentiate the properties of soils such as phase relationships, unit weight, water content, grain size distribution, index properties, methods of soil classifications and compaction characteristics in soils	Understand
C313.2	To Interpret the concepts of total, neutral and effective stress in soils, principles of Darcy’s law, permeability and seepage in soils and their effects in engineering applications	Understand
C313.3	To Express the concepts of stress distribution under varying load conditions using Boussinesq's and Westergaard's theories.	Understand
C313.4	To Summarize the principles of Terzaghi’s theory of primary consolidation, settlement in soils and associated properties	Understand
C313.5	To Analyse the shear stress and shear strength properties in soils, Mohr diagrams, and methods of finding the shear strength parameters of soils using direct shear test, unconfined compression test and tri-axial shear tests.	Analyse
C313.6	To Analyse the Mohr’s circle	Analyse
<b>SPECIFIC LEARNING OUTCOMES – Engineering Geology(15A01504 )</b>		
C314.1	To Interpret the knowledge of principles of engineering geology	Understand
C314.2	To Analyse the properties of various rocks and minerals	Analyse
C314.3	To Justify the suitability of sites for various civil engineering structures.	Evaluate
C314.4	To Explain the knowledge for use of geological strata in the analysis and design the civil engineering structures.	Understand
C314.5	To Describe the suitability of water and soil conservation projects.	Remember
C314.6	To Analyse the structural behavior by using geophysical methods	Analyse

<b>SPECIFIC LEARNING OUTCOMES – Structural Analysis II(15A01505 )</b>		
C315.1	To Analyse three and two hinged ,circular and parabolic arches	Analyse
C315.2	To Apply slope deflection and moment distribution methods to indeterminate structures	Apply
C315.3	To Calculate the effect of support settlements for indeterminate structures	Apply
C315.4	To Analyse indeterminate structures by kani's method	Analyse
C315.5	To Understand various matrix methods	Understand
C315.6	To Understand the principles of plastic collapse, shape factor and behaviour of structures due to ultimate and accidental loading	Understand
<b>SPECIFIC LEARNING OUTCOMES – Water Harvesting and Conservation(15A01507 )</b>		
C317.1	To Identify the causes of soil erosion	Remember
C317.2	To Design soil conservation measures in a watershed	Create
C317.3	To Design water harvesting and ground water recharging structures	Create
C317.4	To Evaluate the measures for reclamation of saline soils	Evaluate
C317.5	To Analyse the water conservation techniques.	Analyse
C317.6	To Discuss the analysis for water conservation for various soils	Understand
<b>SPECIFIC LEARNING OUTCOMES – Engineering Geology Laboratory (15A01508)</b>		
C318.1	To Interpret the knowledge of principles of engineering geology	Understand
C318.2	To Identify the physical properties of Minerals and Rocks in the laboratory	Remember
C318.3	To Justify the suitability of sites for various civil engineering structures.	Evaluate
C318.4	To Explain the knowledge for use of geological strata in the analysis and design the civil engineering structures	Understand
C318.5	To Describe the suitability of water and soil conservation projects.	Understand
C318.6	To Analyze the structural behaviour by using geophysical methods.	Analyze
<b>SPECIFIC LEARNING OUTCOMES – Geotechnical Engineering Laboratory (15A01509)</b>		
C319.1	To Classify the soil based on Index Properties of Soil	Analyze
C319.2	To Calculate the Field and Dry Density of Cohesion-less and Cohesive soils.	Apply
C319.3	To Determine the Coefficient of Permeability of Coarse grained and Fine grained soils& also Compressibility Characteristics of Soil..	Apply
C319.4	To Evaluate the Shear Strength Parameters of Soil.	Evaluate
C319.5	To Interpret the Engineering Properties of soil by Direct Shear Test	Understand
C319.6	To Demonstrate various Experiments on Consolidation of Soil.	Apply
<b>SPECIFIC LEARNING OUTCOMES – Audit course - Social Values &amp; Ethics (15A99501)</b>		
C311.1	To Differentiate between Basic Concepts of Family and Society	Understand
C311.2	To Analyse about Social Harmony and National Integration	Analyse
C311.3	To Understand the knowledge about Environment Issues	Understand
C311.4	To Explain about Gender Sensitization, Civil/ Self Defence	Understand
C311.5	To Differentiate between Physical, Psychological, Social problems	Understand
C311.6	To Differentiate between Kriyas, Bandhas and Mudras	Understand

AY : 2020-21		IV YEAR- I Sem
On successful completion of this course the students will be able:		
SNO	Course Outcomes Statement	Taxonomy
<b>SPECIFIC LEARNING OUTCOMES – Finite Element Methods(15A01701 )</b>		
C411.1	To Understand the fundamental concepts of the Finite Element Method (FEM)	Understand
C411.2	To Apply the basic properties, behaviour and usage of different types of finite elements	Apply
C411.3	To Develop shape functions and stiffness matrices for spring and bar elements	Create
C411.4	To Apply natural and Arial coordinate systems to constant strain triangle and linear Strain triangle elements	Apply
C411.5	To Identify the application and characteristics of FEA elements such as bars, beams, plane and Iso-parametric elements	Remember
C411.6	To Create Finite Element models and solve typical Civil Engineering. Problems using FEM	Create
<b>SPECIFIC LEARNING OUTCOMES – Transportation Engineering II(15A01702 )</b>		
C412.1	To Interpret the importance of railway infrastructure planning and design	Understand
C412.2	To Identify the factors governing design of railway infrastructures	Remember
C412.3	To Design and analyze the railway track system	Create
C412.4	To Explain the process of execution of railway projects	Understand
C412.5	To Analyse and design of the airport runway	Analyse
C412.6	To Analyse about the description of harbours & ports	Analyse
<b>SPECIFIC LEARNING OUTCOMES – Environmental Engineering(15A01703 )</b>		
C413.1	To Identify the source of water and water demand	Remember
C413.2	To Apply the water treatment concept and methods	Apply
C413.3	To Prepare basic process designs of water and wastewater treatment plants collect, reduce, analyze, and evaluate basic water quality data	Create
C413.4	To Determine the sewage characteristics	Apply
C413.5	To Apply environmental treatment technologies and design processes	Apply
C413.6	To Predict the causes of air pollution and noise pollution	Evaluate
<b>SPECIFIC LEARNING OUTCOMES – Water Resource Engineering II(15A01704 )</b>		
C414.1	To Understand various hydraulic structures such as diversion head work, canal falls and structures involved in cross drainage works	Understand
C414.2	To Differentiate the different aspects of design of hydraulic structures	Understand
C414.3	To Design various canal systems	Create
C414.4	To Design head and cross regulator structures	Create
C414.5	To Identify various types of reservoir and their design aspects	Remember
C414.6	To Discuss about flood routing concepts & Design of different types of dams	Understand
<b>SPECIFIC LEARNING OUTCOMES – Design and Drawing of Irrigation Structures(15A01705 )</b>		

C415.1	To Express knowledge of various irrigation structures	Understand
C415.2	To Discuss various structures involved in cross drainage work	Understand
C415.3	To Design various irrigation structural components	Create
C415.4	To Solve design aspects of irrigation structures	Apply
C415.5	To Illustrate various operation procedures of hydraulic structures	Apply
C415.6	To Design and identify various types of reservoirs	Create
<b>SPECIFIC LEARNING OUTCOMES – Ground Improvement Techniques(15A01706 )</b>		
C416.1	To Understand soil dewatering techniques with respect to field conditions.	Understand
C416.2	To Understand grouting techniques with respect to field conditions.	Understand
C416.3	To Understand about the improvement of in-situ cohesive soils as well as Cohesion less soils	Understand
C416.4	To Design the principles of reinforced soil walls.	Create
C416.5	To Apply the Applications of geo synthetics in suitable field conditions	Apply
C416.6	To Identify about the problematic soil	Remember
<b>SPECIFIC LEARNING OUTCOMES – Rehabilitation and Retrofitting of Structure(15A01710 )</b>		
C410.1	To Identify and define all the terms and concepts associated with deterioration and distress in concrete structures.	Remember
C410.2	To Design and develop maintenance of structures, type and properties of repair materials etc	Create
C410.3	To Develop various maintenance and repair strategies	Create
C410.4	To Evaluate the existing buildings through field investigations	Evaluate
C410.5	To Understand different strengthening methods for structural retrofitting and jacketing	Understand
C410.6	To Understand various types of sensors and building instrumentation	Understand
<b>SPECIFIC LEARNING OUTCOMES – CAD Laboratory(15A01711 )</b>		
C4111.1	To Sketch out Two Dimensional sketches, views in CAD environment	Apply
C4111.2	To Apply structural drawing of reinforced concrete elements such as beams.	Apply
C4111.3	To Design structural drawing of Reinforced Concrete Elements such as Beams.	Create
C4111.4	To Design Structural drawings of steel elements such as Tension members and Compression members.	Create
C4111.5	To Design Structural drawings of steel elements such as Beams, Column Base and Roof Trusses	Create
C4111.6	To Design Various connections or Joint details.	Create
<b>SPECIFIC LEARNING OUTCOMES – Environmental Engineering Laboratory(15A01712 )</b>		
C4112.1	To Estimate various parameters like PH, Chlorides, Sulphates, Nitrates in water	Evaluate
C4112.2	To Demonstrate the laboratory experiments on various parameters of water and waste water.	Apply
C4112.3	To Analyse the technical laboratory report on quality assessment of potable and waste water.	Analyse
C4112.4	To Estimate of industrial effluents of samples in the laboratory	Evaluate
C4112.5	To Apply the laboratory results in the basic environmental design and in the field of Engineering	Apply
C4112.6	To Analyse and estimate the quality of water both in potable water and waste water.	Analyse



<b>Course Outcomes (II Year) 2020-21 I Sem</b>		
<b>Course Name: Mathematical Foundations of Computer Science</b>		
<b>NO</b>	<b>Course Outcome</b>	<b>Taxonomy</b>
C211.1	Evaluate basic logic statements using truth tables and properties of logic and find the PCNF and PDNF	Evaluate
C211.2	Describe the properties of sets ,functions and groups	Understand
C211.3	Understand the concepts of algebraic	Understand
C211.4	Explain the fundamental principle of counting and identify the relationship between permutations and combinations	Understand
C211.5	Determine the recurrence relation using generating functions	Apply
C211.6	Understand the concepts of graphs &Apply the concepts of functions to identify the isomorphic graphs ,DFS,BFS and spanning trees	Apply
<b>Course Name: Digital Logic Design</b>		
<b>NO</b>	<b>Course Outcome</b>	<b>Taxonomy</b>
C212.1	Differentiate various number systems, binary codes	Understand
C212.2	Solve the Boolean Expressions using basic postulates of Boolean algebra.	Apply
C212.3	Solve the Boolean Expressions using k-maps and other minimization methods .	Apply
C212.4	Design different combinational circuits.	Create
C212.5	Analyze different Sequential circuits.	Analyze
C212.6	Understand different types of Programmable Logic Devices and Transistor Logic Circuits.	Understand
<b>Course Name: Design Thinking</b>		
<b>NO</b>	<b>Course Outcome</b>	<b>Taxonomy</b>
C213.1	Explain about Design and Process of Product Development	Understand
C213.2	Describe about benefits, principles , innovation and various case studies in design thinking	Understand
C213.3	Identify the Idea generation techniques and methods used for Product development	Remember
C213.4	Analyze the design thinking process in IT and Agile software development	Analyze
C213.5	Use TILES toolkit and cloud implementation for Design thinking activities in IT	Apply
C213.6	Describe about design techniques related to Variety of Software services.	Understand
<b>Course Name: Database Management Systems</b>		
<b>NO</b>	<b>Course Outcome</b>	<b>Taxonomy</b>
C214.1	Analyse database concepts and structures and query language	Analyse



C214.2	Develop the E R model and relational model	Create
C214.3	Apply various Normalization techniques	Apply
C214.4	Build various advance SQL queries related to Transaction Processing & Locking using concept of Concurrency control.	Create
C214.5	Describe query processing and techniques involved in query optimization.	Understand
C214.6	Determine the principles of storage structure and recovery management.	Apply
<b>Course Name: Object Oriented Programming Through Java</b>		
<b>NO</b>	<b>Course Outcome</b>	<b>Taxonomy</b>
C215.1	Understand the syntax, semantics, various string handling functions indulging type conversion and casting of Java Programming Language.	Understand
C215.2	Illustrate code reusability through inheritance, packages and interfaces	Apply
C215.3	Create User defined Exceptions with exception handling	Create
C215.4	Identify the difference between various files and streams	Remember
C215.5	Use multithreading, prebuilt generic data structures framework and Collections.	Apply
C215.6	Use the JDBC API to access database, build GUIs and handle events generated by user interactions.	Apply
<b>Course Name: Python Programming</b>		
<b>NO</b>	<b>Course Outcome</b>	<b>Taxonomy</b>
C216.1	Apply the basic concepts, modular approach to solve the problems.	Apply
C216.2	Design the programs using conditional execution, recursion, built in functions, turtle	Create
C216.3	Design programs to manipulate strings	Create
C216.4	Apply python programs to read and write data from/to files.	Apply
C216.5	Design the programs by choosing appropriate data structures like lists, dictionaries, tuples.	Create
C216.6	Apply object oriented programming concepts	Apply
<b>Course Name: Universal Human Values</b>		
<b>NO</b>	<b>Course Outcome</b>	<b>Taxonomy</b>
C217.1	Discuss the concept value-education in individual's life for happiness & prosperity	Understand
C217.2	Explain the term self-exploration and its application for self-evaluation and development.	Understand
C217.3	Discuss the importance of values in human relationships	Understand
C217.4	Explain the holistic perception of harmony at level of self, family, society and nature.	Understand
C217.5	Outline the co-existence of nature and human being	Analyze
C217.6	Use professional ethics in their future profession for making a value-based	Apply

	society	
<b>Course Name: Database Management Systems Lab</b>		
<b>NO</b>	<b>Course Outcome</b>	<b>Taxonomy</b>
C218.1	Describe the basic concept of Database System and Applications	Remember
C218.2	Use the Basic of SQL and construct queries using SQL	Apply
C218.3	Develop Program in PL/SQL including Procedures, Functions .	Create
C218.4	Develop PL/SQL programming using concept of Package and Triggers	Create
C218.5	Design of database using Normalization.	Create
C218.6	Design of Database Applications	Create
<b>Course Name: Object Oriented Programming Through Java Lab</b>		
C219.1	Understand syntax and semantics of Java Programming Language.	Understand
C219.2	Write portable programs which work in all environments.	Create
C219.3	Solve the problem using object oriented concepts.	Apply
C219.4	Use Multi-threading and Applet Programming.	Apply
C219.5	Create user friendly interfaces.	Create
C219.6	Use Exception Handling.	Apply
<b>Course Name: Python Programming Lab</b>		
C2110.1	Design solutions to solve mathematical problems	create
C2110.2	Develop python programs that read and write data from & to files	create
C2110.3	Build Python user defined functions for solving problems	create
C2110.4	design object-oriented programs with Python classes	create
C2110.5	Illustrate Conditionals and Loops for Python Programs	Analyse
C2110.6	Develop graphics using python turtle library	create
<b>Course Name: Environmental Science</b>		
C2111.1	Gain the knowledge about environment , natural resources and different techniques involved in its conservation.	Understand
C2111.2	Get the information about different eco-systems and its functions.	Understand
C2111.3	Recognize the types of bio-diversity along with values and conservation methods.	Analyse

C2111.4	Gain the knowledge about various environmental pollutions and able to design the environmental friendly process in engineering.	Apply
C2111.5	Gain the knowledge about sustainable development concept and practice it in life, society and Industry.	Apply
C2111.6	Understand the both impacts of population growth on environment and needed measures to protect the environment .	Understand

<b>Course Outcomes (III Year) 2020-21 I Sem</b>		
<b>Course Name: Operating Systems</b>		
<b>NO</b>	<b>Course Outcome</b>	<b>Taxonomy</b>
C311.1	Explain the role of Operating System, its functions and types	Understand
C311.2	Illustrate the concepts of process, Multi processing, Thread and Multi threading	Analyse
C311.3	Compare the performance of various CPU scheduling algorithms	Evaluate
C311.4	Outline different ways to handle the deadlocks and process synchronization	Analyse
C311.5	Compare and contrast various memory management techniques	Evaluate
C311.6	Describe the concepts of File system, I/O management, protection and security	Understand
<b>Course Name: Computer Networks</b>		
<b>NO</b>	<b>Course Outcome</b>	<b>Taxonomy</b>
C312.1	Analyse types of networks, network topologies and functions of each layer in OSI, TCP/IP reference models.	Analyse
C312.2	Analyse types of switching and transmission media with real time applications.	Analyse
C312.3	Describe functions of data link layer and explain data link layer protocols.	Understand
C312.4	Classify routing and congestion control algorithms and analyse how to assign IP addresses for given network	Analyse
C312.5	Describe transport layer design issues and protocols of transport layer.	Understand
C312.6	Describe application layer design issues and protocols of application layer.	Understand
<b>Course Name: Object Oriented Analysis and Design</b>		
<b>NO</b>	<b>Course Outcome</b>	<b>Taxonomy</b>
C313.1	Design the solutions to the complex problems using object oriented Approach	Create
C313.2	Explain classes, objects and responsibilities of the problem domain	Understand
C313.3	Explain Conceptual model of UML	Understand
C313.4	Create Structural Modeling to the given problem using UML concepts	Create
C313.5	Analyse Behavioral modelling Diagrams	Analyse
C313.6	Develop Behavioral modeling to the given problem using UML concepts	Create
<b>Course Name: Principles of Programming Languages</b>		
<b>NO</b>	<b>Course Outcome</b>	<b>Taxonomy</b>
C314.1	Choose software development process and software design models	Analyse
C314.2	Apply data types and type systems of various programming languages.	Apply
C314.3	Analyse the structure of program and computation	Analyse
C314.4	Analyse the concepts of programming languages.	Analyse
C314.5	Apply functional programming languages and their syntaxes	Apply

C314.6	Apply logic programming languages and their syntaxes.	Apply
<b>Course Name: Software Testing</b>		
<b>NO</b>	<b>Course Outcome</b>	<b>Taxonomy</b>
C315.1	Understand the basic testing procedures	Understand
C315.2	List transaction flows ,data flow testing, their techniques and implementation comments in software testing	Remember
C315.3	Understand domains and interface testing and their testability tips.	Understand
C315.4	develop paths, regular expressions and logic based testing	Create
C315.5	Design and implement state graph, state testing, good state graph, bad state graph and their testability tips	Create
C315.6	Describe graph matrices, matrix properties and node reduction algorithm	Understand
<b>Course Name: Introduction to Big Data</b>		
<b>NO</b>	<b>Course Outcome</b>	<b>Taxonomy</b>
C316.1	Demonstrate client – Server architecture and illustrate the components of cloud.	Apply
C316.2	Assess and Process Data on Distributed File System	Evaluate
C316.3	Design Job Execution in Hadoop Environment	Create
C316.4	Develop Big Data Solutions using Hadoop Eco System	Create
C316.5	Analyze Info sphere Big Insights Big Data Recommendations.	Analyze
C316.6	Develop a Map Reduce Environment	Create
<b>Course Name: Object Oriented Analysis &amp; Design and Software Testing Laboratory</b>		
<b>NO</b>	<b>Course Outcome</b>	<b>Taxonomy</b>
C317.1	design UML diagrams to the College information system using UML notations and object oriented approach	Create
C317.2	develop UML diagrams to the Hostel management using UML notations and object oriented approach	Create
C317.3	create UML diagrams to the ATM system using UML notations and object oriented approach	Create
C317.4	demonstrate the programs and its failures	Apply
C317.5	support in generating test plan, test cases and test suites	Evaluate
C317.6	Analyze of Testing Tools	Analyze
<b>Course Name: Operating Systems Laboratory</b>		
<b>NO</b>	<b>Course Outcome</b>	<b>Taxonomy</b>
C318.1	Choose the best CPU scheduling algorithm for a given problem instance	Evaluate
C318.2	Build code to for file allocation and file organization techniques	Create
C318.3	Assess the performance of page replacement algorithms	Evaluate
C318.4	Analyze various classical Synchronization problems	Analyze
C318.5	Classify various memory management techniques	Analyze
C318.6	Develop algorithm for deadlock avoidance and detection	Create
<b>Course Name: Social Values and Ethics</b>		
<b>NO</b>	<b>Course Outcome</b>	<b>Taxonomy</b>

C319.1	Discuss the ethical values and social context of problems	Understand
C319.2	Outline the social responsibilities of an engineer, rights and qualities of moral Leadership.	Analyze
C319.3	Explain philosophy of Life and Individual qualities	Understand
C319.4	Discuss the core values that shape the ethical behavior of an engineer.	Understand
C319.5	Develop appropriate technologies and management patterns to create harmony in professional and personal life.	Create
C319.6	Outline environment conservation, enrichment and sustainability	Analyze

<b>Course Outcomes(IV Year) 2020-21 I Sem</b>		
<b>Course Name: Management Science</b>		
<b>NO</b>	<b>Course Outcome</b>	<b>Taxonomy</b>
C411.1	Explain the basic concepts of management in modern contexts.	Understand
C411.2	Define organization structures and principles.	Remember
C411.3	Demonstrate production and marketing aspects.	Apply
C411.4	Outline the roles and responsibilities of Human Resource Manager.	Analyze
C411.5	Formulate strategies in the modern management.	Create
C411.6	Compare the modern management practices based on the requirement of the projects.	Evaluate
<b>Course Name: Grid &amp; Cloud Computing</b>		
<b>NO</b>	<b>Course Outcome</b>	<b>Taxonomy</b>
C412.1	Classify Grid and Cloud Computing Services such as PASS, SAAS, and IAAS	Understand
C412.2	Explain cloud architecture and applications on different cloud platforms	Understand
C412.3	Compare grid architecture and applications on different platforms	Analyze
C412.4	Summarize various grid and cloud computing tools	Evaluate
C412.5	Compare various security models in the grid and the cloud environment	Evaluate
C412.6	Design grid computing techniques to solve large scale scientific problems	Analyze
<b>Course Name: Information Security</b>		
<b>NO</b>	<b>Course Outcome</b>	<b>Taxonomy</b>
C413.1	List the information security requirements for a client and server	Remember
C413.2	Explain cryptographic algorithms, authentication and security issues	Understand
C413.3	Develop algorithms and methods for web security with IPV4 and IPV6.	Create
C413.4	Analyze the Security and legal issues towards information security.	Analyse
C413.5	Assess the fundamentals of secret and public cryptography.	Evaluate
C413.6	Design a secure network with available solutions like PGP, SSL, etc.	Create
<b>Course Name: Mobile Application Development</b>		
<b>NO</b>	<b>Course Outcome</b>	<b>Taxonomy</b>
C414.1	Describe mobile application software development tools	Understand
C414.2	Use various widgets in mobile applications	Apply
C414.3	Compare various layouts in mobile application design	Analyse
C414.4	Use external resources in mobile applications	Apply

C414.5	Build mobile application with selection widgets, dialogs and Fragments	Create
C414.6	Design and develop menus, database and notifications in mobile applications	Create
<b>Course Name: Software Architecture</b>		
<b>NO</b>	<b>Course Outcome</b>	<b>Taxonomy</b>
C415.1	Able to understand the basic concepts of software architecture and software architecture Business cycle.	Understand
C415.2	Understand the various architectural styles with case studies	Understand
C415.3	Define various quality attributes of software architecture and explain the techniques to them.	Remember
C415.4	Understand the concepts of various architectural patterns and some design patterns.	Understand
C415.5	Acquire solid foundation in the field of designing and documenting Software architecture.	Create
C415.6	Use well-understood paradigms for designing new systems	Create
<b>Course Name: Software Project Management</b>		
<b>NO</b>	<b>Course Outcome</b>	<b>Taxonomy</b>
C416.1	To understand the concepts of Conventional Software Management Performance, models and Software Economics.	Understand
C416.2	To Evaluate and improve the software processes to achieve required quality.	Evaluate
C416.3	To understand the concepts about principles of modern software management.	Understand
C416.4	To design and to integrate life cycle phases and artifacts of various process to model a software based architecture.	Create
C416.5	To classify the process workflow, analyse about periodic status assessment, planning and project organization responsibilities.	Analyze
C416.6	To recognize about the project control and process instrumentation using metrics and indicators.	Understand
<b>Course Name: Grid &amp; Cloud Computing Laboratory</b>		
<b>NO</b>	<b>Course Outcome</b>	<b>Taxonomy</b>
C417.1	Design and Implement applications on the Microsoft Azure.	Create
C417.2	Design and Implement applications on the Zoho cloud.	Create
C417.3	Develop software's using and Google Play Store.	Create
C417.4	Implement grid Security architecture.	Evaluate
C417.5	Develop Globus tool kit and develop applications.	Create
C417.6	Implement Google drive effectively and efficiently.	Evaluate
<b>Course Name: Mobile Application Development Laboratory</b>		
<b>NO</b>	<b>Course Outcome</b>	<b>Taxonomy</b>
C418.1	Setup applications on mobile application development environment	Create
C418.2	Operate mobile applications on handheld devices	Apply
C418.3	Develop various widgets in mobile applications	Create
C418.4	Design mobile applications with various layouts	Create
C418.5	Build mobile application along with Media	Create
C418.6	Design and develop menus in mobile applications	Create



<b>Course Outcomes (II Year) 2020-2021 I Sem</b>		
<b>CO.NO</b>	<b>COURSE OUTCOMES</b>	<b>Taxonomy</b>
<b>Specific learning outcomes – Complex Variables, Transforms and PDE (19A54301)</b>		
C211.1	Find the analytic functions using C-R equations, the image using conformal mapping and bi-linear transformation.	Apply
C211.2	Use Cauchy's theorem, Cauchy's integral formula and Cauchy's residues theorem to evaluate complex integrations and expansion of complex functions using Taylor's and Laurent's series.	Apply
C211.3	Define Laplace and inverse Laplace transforms of various functions and solve ordinary differential equations using Laplace transform.	Apply
C211.4	Determine Fourier series of periodic functions in a given interval and Parseval's formula- Complex form of Fourier series.	Apply
C211.5	Construct the partial differential equations and solve first order and second order PDEs by Lagrange's method and method of separation of variables respectively	Apply
C211.6	Solve one dimensional wave, heat and Laplace equations.	Apply
<b>Specific Learning Outcomes – Python Programming (19A05304T)</b>		
C212.1	Interpret the basic concepts, modular approaches to solve the problems.	Understand
C212.2	Apply the concepts of conditional execution, recursion, built in functions, turtle to solve the problems	Apply
C212.3	Define and demonstrate the use of built-in String functions	Remember
C212.4	Apply python programs to read and write data from/to files.	Apply
C212.5	Summarize various data structures like Lists, Dictionaries, Tuples and its applications.	Understand
C212.6	Identify Python classes, objects, inheritance, goodies	Apply
<b>Specific Learning Outcomes – Manufacturing Processes (19A03301T)</b>		
C213.1	Differentiate various metal casting processes by understanding its defects and remedies.	Understand
C213.2	Describe the nature of various plastic deformation techniques used in hot and cold working of metals.	Understand
C213.3	Explain the different welding processes for defect free joints.	Understand
C213.4	Explain the steps involved in making of ceramics, processing of plastics.	Understand
C213.5	Describe the principle and steps involved in powder metallurgy.	Understand
C213.6	Demonstrate the principle and working of unconventional machining processes.	Understand
<b>Specific Learning Outcomes – Engineering Mechanics (19A03302)</b>		
C214.1	Analyze free body diagrams and concurrent and non concurrent forces at equilibrium condition.	Analyze
C214.2	Solve different types of friction problems.	Apply
C214.3	Analyze the perfect frames and concepts of virtual work	Analyze
C214.4	Determine the centroid, centre of gravity of composite figures and mass moment of inertia for solid bodies.	Apply
C214.5	Apply the principles of kinematics to rigid bodies.	Apply
C214.6	Apply the principles of kinetics to rigid bodies.	Apply
<b>Specific Learning Outcomes – Material Science and Engineering (19A03303T)</b>		
C215.1	Describe the physical metallurgy of metals	Understand

C215.2	Explain the Alloying and phase diagrams of metals.	Understand
C215.3	Explain Structure and properties of Ferrous and Non-ferrous metals	Understand
C215.4	Explain the methods to change the properties of materials through heat treatment processes	Understand
C215.5	Describe properties and applications of ceramics, polymers and composite materials.	Understand
C215.6	Explain the fundamental properties of Nano- materials and their applications.	Understand
<b>Specific Learning Outcomes – Design Thinking &amp; Product Innovation (19A99303T)</b>		
C216.1	Summarize the importance of basic sciences in product development	Understand
C216.2	Explain the historical developments in mechanical, electrical, communications and computational engineering	Understand
C216.3	Apply systematic approach to innovative designs	Understand
C216.4	Identify new materials and manufacturing methods in design	Understand
C216.5	Develop simple electrical gadgets.	Understand
C216.6	Understand reverse engineering methods in product development.	Understand
<b>Specific Learning Outcomes – Design Thinking &amp; Product Innovation Lab (19A99303P)</b>		
C217.1	Develop 3D models using 3D printing	Create
C217.2	Design the system with measuring devices	Apply
C217.3	Design hydraulic / pneumatic circuits	Apply
C217.4	Design and simulate hydraulic systems	Apply
C217.5	Apply electronic sensors for automation	Apply
C217.6	Design farm products.	Create
<b>Specific Learning Outcomes – Manufacturing Processes Lab (19A03301P)</b>		
C218.1	To calculate the pouring and solidification time during casting process.	Apply
C218.2	To illustrate the strength and permeability of sand used in moulding process.	Apply
C218.3	To produce defect free joints by applying TIG & MIG welding process.	Apply
C218.4	To produce defect free joints by applying special welding process.	Apply
C218.5	To model press working operations by using simple dies.	Apply
C218.6	To demonstrate the working principle of non-traditional manufacturing processes.	Understand
<b>Specific Learning Outcomes – Material Science and Engineering Lab (19A03303P)</b>		
C219.1	Identify the microstructures of Pure metals- Iron, copper and aluminium.	Apply
C219.2	Illustrate the microstructures of ferrous and non-ferrous metals and its alloys.	Apply
C219.3	Understand the Hardenability of steels by Jominy End Quench Test.	Apply
C219.4	Evaluate hardness of treated and untreated steels.	Apply
C219.5	Study of microstructure of ceramics, polymeric materials, super alloy and Nano-materials.	Apply
C219.6	Evaluate hardness of ceramics, super alloys, Nano-materials and polymeric materials	Apply
<b>Specific Learning Outcomes – Universal Human Values (19A99302)</b>		
C2110.1	Discuss the concept value-education in individual's life for happiness & prosperity	Understand

C2110.2	Explain the term self-exploration and its application for self-evaluation and development.	Understand
C2110.3	Discuss the importance of values in human relationships	Understand
C2110.4	Explain the holistic perception of harmony at level of self, family, society and nature.	Understand
C2110.5	Outline the co-existence of nature and human being	Analyze
C2110.6	Use professional ethics in their future profession for making a value-based society	Apply

<b>Course Outcomes (III Year) 2020-2021 I Sem</b>		
<b>CO.NO</b>	<b>COURSE OUTCOMES</b>	<b>Taxonomy</b>
<b>Specific learning outcomes – Fluid Mechanics &amp; Hydraulic Machines (15A01510)</b>		
C311.1	Describe the importance of various fluid properties which are at rest and in motion.	Understand
C311.2	Apply the governing equations to estimate flow quantities.	Apply
C311.3	Design the pipe line network based on frictional loss estimate.	Apply
C311.4	Explain the Hydroelectric Power plant with the available water resources and requirement of power.	Understand
C311.5	Evaluate the performance characteristics of hydraulic turbines.	Evaluate
C311.6	Evaluate the performance characteristics of Centrifugal Pumps.	Evaluate
<b>Specific Learning Outcomes – Thermal Engineering-II (15A03501)</b>		
C312.1	Quantify the performance of Rankine cycles and combined cycles based on thermodynamic analysis.	Apply
C312.2	strate the selection of boilers used in power plants.	Understand
C312.3	Design a chimney required for a power plant using systematic approach.	Apply
C312.4	Analyze the nozzles and condensers for different steam flow conditions. (Understand)	Understand
C312.5	Estimate the performance of steam turbines using flow velocity triangles.	Apply
C312.6	e the gas turbines based on cycles.	Analyse
<b>Specific Learning Outcomes – Dynamics of Machinery (15A03502)</b>		
C313.1	Explain the concepts of friction and its pivotal role in the functioning of collars, pivots, brakes, clutches and dynamometers.	Understand

C313.2	Apply gyroscopic principles on the motion of aeroplane, ship, four wheel and two wheel vehicles.	Apply
C313.3	Design a flywheel and also develop turning moment diagram for an IC engine.	Apply
C313.4	Describe the constructional and working characteristics of distinguished governors.	Understand
C313.5	Explain the means of balancing of rotating and reciprocating masses, in an IC engine, V-engine, multi cylinder engine and locomotives.	Understand
C313.6	Evaluate the response of a vibratory system instigated from either one or more of free, forced and damped vibrations with diverse nature.	Evaluate
<b>Specific Learning Outcomes – Machine Tools (15A03503)</b>		
C314.1	Interpret the tool geometry on chip formation and cutting processes.	Evaluate
C314.2	Identify the basic parts and operations performed on conventional machine tools.	Understand
C314.3	Estimate the machining parameters for machine tools.	Apply
C314.4	Select the type of machine tool and corresponding cutting tool required for a given geometry.	Understand
C314.5	Demonstrate the design features of jigs and fixtures.	Understand
C314.6	Use most advanced machine tools used in industrial automation.	Apply
<b>Specific Learning Outcomes – Design of Machine Members – I (15A03504)</b>		
C315.1	Design the machine elements using theories of failure.	Apply
C315.2	Design simple components under cyclic loading using Goodman's and Soderberg equation.	Apply
C315.3	Design riveted joints with different configuration, boiler shell joint design and eccentric loading design of riveted joints.	Apply
C315.4	Design bolted joints with direct loading and eccentric loading	Apply
C315.5	Design cotter joint, knuckle joint and shafts	Apply
C315.6	Design various types of keys, rigid and flexible shaft couplings.	Apply
<b>Specific Learning Outcomes – Entrepreneurship (15A03505)</b>		
C316.1	Explain the role and responsibilities of an entrepreneur in modern business scenario.	Understand
C316.2	Model and start the new venture.	Apply
C316.3	Prepare and implement the business plan.	Create
C316.4	Discuss the sources of finance and managing the venture.	Understand
C316.5	Demonstrate the new venture expansion strategies and issues.	Apply

C316.6	Discuss production and marketing aspects of entrepreneurship.	Understand
<b>Specific Learning Outcomes – FM &amp; HM Laboratory (15A01511)</b>		
C317.1	Demonstrate the knowledge on various flow measuring instruments.	Apply
C317.2	Evaluate the coefficient of discharge of flow through pipes.	Evaluate
C317.3	Evaluate the major and minor losses for conduit flows.	Evaluate
C317.4	Analyze the performance characteristics of hydraulic turbines.	Analyze
C317.5	Analyze the performance characteristics of hydraulic pumps.	Analyze
C317.6	Analyze the percentage of error in discharge in flow through pipes.	Analyze
<b>Specific Learning Outcomes – Machine Tools Laboratory (15A03508)</b>		
C318.1	Explain the working of various parts of machine tools.	Evaluate
C318.2	Operate step turning, thread cutting and Knurling operations on lathe.	Apply
C318.3	Operate drilling and tapping operations using drilling machine.	Apply
C318.4	Operate keyway cut using Slotting Machines.	Apply
C318.5	Operate gear cutting using milling machine.	Apply
C318.6	Model the tool angles on single point cutting tool.	Apply
<b>Specific Learning Outcomes – Audit course- Social Values &amp; Ethics (15A99501)</b>		
C319.1	Assess their own ethical values and social context of problems.	Evaluate
C319.2	Determine the professional ethics which includes moral issues and virtues, social responsibilities of an engineer, right, and qualities of Moral Leadership.	Apply
C319.3	Explain about philosophy of Life and Individual qualities.	Understand
C319.4	Identify the core values that shape the ethical behaviour of an engineer and to create awareness on Engineers responsibilities and rights.	Remember
C319.5	Describe appropriate technologies and management patterns to create harmony in professional and personal life.	Understand
C319.6	Explain their learning's about environment conservation, enrichment and Sustainability.	Understand

<b>Course Outcomes (IV Year) 2020-2021 I Sem</b>		
<b>S.NO</b>	<b>COURSE OUTCOMES</b>	<b>Taxonomy</b>
<b>Specific learning outcomes – Management Science (15A52601)</b>		
C411.1	Explain the basic concepts of management in modern contexts.	Understand
C411.2	Define organization structures and principles.	Understand
C411.3	Demonstrate production and marketing aspects.	Understand
C411.4	Outline the roles and responsibilities of Human Resource Manager.	Understand
C411.5	Formulate strategies in the modern management.	Apply
C411.6	Compare the modern management practices based on the requirement of the projects.	Understand
<b>Specific Learning Outcomes – Automobile Engineering (15A03701)</b>		
C412.1	Describe the functions of components in automobile.	Understand
C412.2	Demonstrate the working of transmission system use in automobile	Understand
C412.3	Explain the methods of steering system and their applications.	Understand
C412.4	Demonstrate the suspension systems in automobile.	Understand
C412.5	Summarize the functions of automobile breaking systems.	Understand
C412.6	Explain emission control techniques and electrical systems adopted in automobiles.	Understand
<b>Specific Learning Outcomes – CAD/CAM (15A03702)</b>		
C413.1	Describe the cycles in CAD, CAM and CAD/CAM systems which are used in the real time industry.	Understand
C413.2	Describe the tools used in Geometric modelling and various computer aided design considerations.	Understand
C413.3	Describe the NC tools, process held in the manufacturing units	Understand
C413.4	Demonstrate the Numerical Control programming in turning milling machines.	Understand
C413.5	Assess the quality of products using group technology technique.	Apply
C413.6	Describe the various process plans held in the industry and learning about MRP.	Understand
<b>Specific Learning Outcomes – Metrology &amp; Measurements (15A03703)</b>		

C414.1	Explain the concept of limits, fits and jigs.	Understand
C414.2	Demonstrate the concept of measuring standard measurements using comparators. (	Understand
C414.3	Demonstrate the measurement of surface profiles.	Understand
C414.4	Use the machine tool alignment test to prepare the acceptance charts.	Apply
C414.5	Calibrate the dynamic quantities using transducers.	Apply
C414.6	Calibrate the mechanical quantities using transducers.	Apply
<b>Specific Learning Outcomes – Modern Manufacturing Methods (15A03706)</b>		
C415.1	Understand the principles of a range of modern manufacturing technologies, apply subtractive and additive manufacturing for rapid prototyping.	Understand
C415.2	Describe the specific process characteristics of various modern manufacturing technologies and identify their possible applications and metal removal rate	Understand
C415.3	Students can able to know the fundamentals of electrochemical machining, its economical concepts and basics of chemical marching.	Understand
C415.4	Able to study the principles of EDM, EDG, PM, its applications	Understand
C415.5	Able to know the applications and limitations of Electron Beam machining and laser Beam Marching.	Understand
C415.6	Understand the fusion deposition modeling and solid ground curing	Understand
<b>Specific Learning Outcomes – Automation and Robotics(15A03708)</b>		
C416.1	Understand the importance of automation systems	Understand
C416.2	Explain about storage systems and flow lines	Understand
C416.3	Demonstrate working of robot components	Apply
C416.4	List the application of industrial robots	Remember
C416.5	Demonstrate the usage of robot accessories	Apply
C416.6	Analyze the dynamics characteristics of manipulator	Analyze
<b>Specific Learning Outcomes – CAD/CAM Laboratory (15A03710)</b>		
C417.1	Use CAD tools for 2D & 3D drawings of Mechanical Components.	Apply
C417.2	Show the 3D solid models into 2D drawing and orthographic views.	Apply
C417.3	Model the simple machine parts and assemble from part drawings using standard CAD packages.	Apply

C417.4	Describe the CNC control in modern manufacturing system.	Apply
C417.5	Describe CNC part programming and apply in manufacturing on CNC Turning machine.	Apply
C417.6	Demonstrate the NC Codes for CNC Machine.	Apply
<b>Specific Learning Outcomes – Metrology &amp; Measurements Laboratory (15A03711)</b>		
C418.1	Demonstrate and measure the linear, angular and gear profiles.	Understand
C418.2	Conduct the alignment test on machine tools.	Apply
C418.3	Measure the flatness of the surface by using leveling tools.	Apply
C418.4	Measure the temperature & displacement by using transducers.	Apply
C418.5	Measure the speed, pressure, and strain by using transducers.	Apply
C418.6	Measure the angular measurement & flow measurement by using transducers.	Apply