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DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

F.No:DrTTIT/IQAC/2020-21/075L

Semester: 3
Course1: Transform Calculus, Fourier series and Numerical Techniques
Course1 Code: 18MAT31

Course Outcomes: After studying this course, the students will be able to:

CO 1	Use Laplace transforms and inverse Laplace transforms in solving differential/ Integral equation arising in network analysis, control systems and other field of
CO 2	Demonstrate Fourier series to study the behavior of periodic functions and their applications in system communication, digital signal processing and field theory
CO 3	Make use of Fourier transform and Z transform to illustrate discrete/ continuous function arising in wave and heat propagation, signals and systems
CO 4	Solve I and II order ODE's arising in engineering problems using single and multi step numerical methods.
CO 5	Determine the extremals of functional using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis.

Course Instructor: Manjunatha.S Signature

Course2: Network Theory **Course2 Code: 18EC32**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Compute currents and voltages using source transformation and shifting, kvl, kcl, node and mesh analysis, and star-delta transformation.
CO 2	Apply superposition, reciprocity, thevinins, nortons, milmans, maximum power transfer theorems and electrical laws to reduce circuit complexities and to arrive
CO 3	Estimate the values of currents and voltages for given circuit under transient conditions.
CO 4	Apply the laplace transform to solve the any given network using matlab, python.
CO 5	Solve the network using two port network parameters like z/y/h/t.

Course Instructor: SHASHIKIRAN S Signature

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Course3: Electronic Devices **Course3 Code: 18EC33**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Describe the principles of semiconductor physics.
CO 2	Illustrate the principles and characteristics of pn junctions and optoelectronic devices.
CO 3	Analyze and illustrate the principles and characteristics of different types of semiconductor devices (BJT, FETs).
CO 4	Elucidate the fabrication of pn junctions and integrated circuits.

Course Instructor: KANIMOZHI . S. Signature

Course4: Digital System Design **Course4 Code: 18EC34**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Explain the concept of combinational and sequential logic circuits.
CO 2	Analyze and Design the combinational logic circuits.
CO 3	Analyze and Design the sequential circuits using SR, JK, D, T flip-flops and Mealy & Moore machines
CO 4	Design applications of Combinational & Sequential Circuits.

Course Instructor: Mohana.c Mohana. C. Signature

Course5: Computer Organization & Architecture **Course5 Code: 18EC35**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Able to describe the basic structure of a computer and to analyze the different addressing modes.
CO 2	Able to analyze different ways of accessing input/output devices including interrupts.
CO 3	Able to analyze different types of semiconductor and other secondary storage memories
CO 4	Able to illustrate simple processor organization based on hardwired control and micro-programmed control.

Course Instructor: Nandini G N Nandini Signature

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Course6: Power Electronics & Instrumentation **Course6 Code: 18EC36**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Build and test the power electronics circuits using power electronic devices.
CO 2	Analyze and design the controlled rectifier and DC to DC converters.
CO 3	Analyze the Inverters, SMPS and Develop the Circuits for multi range Ammeters and voltmeters to measure passive component values.
CO 4	Illustrate the principle of operation of Digital voltmeter, Digital multi meter and bridges.
CO 5	Describe the types of Transducers and PLC
CO 6	Use Instrumentation amplifier for measuring physical parameters.

Course Instructor: Dr. Bheemeshiran.T Signature

Course7: Electronic Devices & Instrumentation Laboratory **Course7 Code: 18ECL37**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Understand the characteristics of various electronic devices and measurement of parameters.
CO 2	Design and test simple electronic circuits.
CO 3	Use of circuit simulation software for the implementation and characterization of electronic circuits and devices

Course Instructor: Nandini. GN Signature Nandini

Course8: Digital System Design Laboratory **Course8 Code: 18ECL38**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Able to demonstrate the truth table of various expressions and combinational circuits using logic gates.
CO 2	Able to design the combinational circuits such as adders, Subtractors and comparator.
CO 3	Able to construct flip flops, counters and shift registers.
CO 4	Able to simulate binary multiplier using Pspice Simulation tool

Course Instructor: mohana.c Signature mohana.c

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Semester: 4
Course1: Complex Analysis, Probability and Statistical Methods
Course1 Code: 18MAT41

Course Outcomes: After studying this course, the students will be able to:

CO 1	Use the concept of analytic functions and complex potential to solve the problems arising in electromagnetic field theory
CO 2	Utilize conformal transformation and complex integral arising in aerofoil theory
CO 3	Apply discrete and continuous probability distributions arising in engineering fields.
CO 4	Make use of correlation regression analysis to fit suitable mathematical module for the statistical data.
CO 5	Construct joint probability distribution and demonstrate validity of testing the hypothesis.

Course Instructor: Manjunatha S Signature

Course2: Analog Circuits **Course2 Code: 18EC42**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Design and analyze BJT and MOSFET amplifier circuits.
CO 2	Explain frequency response of MOSFET amplifier at various frequencies.
CO 3	Design and analyze feedback and oscillator circuits.
CO 4	Analyze various types of power amplifiers.
CO 5	Design the various applications of op-amps.

Rajesh Kumar Kaushal
Course Instructor:

Signature

Vijaya
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Course3: Control Systems **Course3 Code: 18EC43**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Develop the mathematical model of mechanical and electrical systems.
CO 2	Develop transfer function for a given control system using block diagram reduction, techniques and signal flow graph method.
CO 3	Determine the time domain specifications for first and second order systems. Learn how to find a mathematical model of electrical, mechanical and electromechanical systems.
CO 4	Determine the stability of a system in the time domain and frequency domain also develop a control system model in continuous and discrete time using state variable techniques.

Course Instructor: Dr. JENITHA A Signature

Course4: Engineering Statistics & Linear Algebra **Course4 Code: 18EC44**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Identify and associate random variables and random processes in communication events.
CO 2	Analyze and model the random events in typical communication events to extract quantitative statistical parameters.
CO 3	Analyze and model typical signal sets in terms of a basis function set of amplitude, phase and frequency.
CO 4	Demonstrate by way of simulation or emulation the ease of analysis employing basis functions statistical representation and eigen values.

Course Instructor: MOHANA.C Signature Mohana.C

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Course5: Signals & Systems **Course5 Code: 18EC45**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Sketch and analyze different types of signals and systems.
CO 2	Obtain the output for LTI systems using time domain and frequency domain representation.
CO 3	Analyze the performance of LTI systems in terms of impulse response.
CO 4	Analyze the performance of LTI systems in frequency domain and time domain using various transforms.

Course Instructor: SHASHIKIRAN.S Signature

Course6: Microcontroller **Course6 Code: 18EC46**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Explain and build circuits using Power Electronic devices.
CO 2	Design Controlled Rectifier, DC to DC Converters,
CO 3	Define Instrumental Errors and develop Circuits for Multi range Ammeters, Voltmeters, Bridges to measure, Current, Voltage, Resistance, Inductance, Capacitance and Frequency.
CO 4	Describe the principle of operation of Digital Instruments and PLC's and various components designed using Transducers
CO 5	Explain the operation and use of inbuilt Timers/ Counters and serial port of 8051.
CO 6	Interface 8051 to external memory and I/O devices using its I/O ports.

Course Instructor: R. VIJAYAGEETHA Signature 01/04/2021

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Course7: Microcontroller Laboratory **Course7 Code: 18ECL47**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Write Assembly language programs in 8051 for solving simple problems that manipulate input data using different instructions of 8051.
CO 2	Interface different input and output devices to 8051 and control them using Assembly language programs.
CO 3	Interface the serial devices to 8051 and do the serial transfer using C programming.

Course Instructor: R. VIJAYA GEETHA Signature 01/04/2021

Course8: Analog Circuits Laboratory **Course8 Code: 18ECL48**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Design and evaluate the performance of analog circuits using BJT/FET.
CO 2	Design and evaluate the performance of analog circuits using opamps for different apps.
CO 3	Design and analyze different oscillators using BJT/FET.
CO 4	Simulate and analyze various analog circuits for different electronic applications.

Course Instructor: TAMILVANI R. Signature

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Semester: 5
Course1: Technological Innovation Management and Entrepreneurship
Course1 Code: 18ES51

Course Outcomes: After studying this course, the students will be able to:

CO 1	Explain the fundamental concepts of Management and Entrepreneurship.
CO 2	Describe the concept of organizing, staffing, directing and controlling.
CO 3	Explain the functions of Managers, Entrepreneurs and their social responsibilities.
CO 4	Describe family business, their stages of development and feasibility analysis.
CO 5	Analyze the business model, financial opportunities to start business and describe project design and network analysis.

Course Instructor: Jesudas T Signature

Course2: Digital Signal Processing **Course2 Code: 18EC52**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Compute Discrete time signals in frequency domain using DFT and its Properties
CO 2	Develop Fast Fourier Transforms Algorithms for computing DFT and IDFT.
CO 3	Design IIR filters from Analog filters and Design FIR filters using Windowing and Frequency Domain Sampling Techniques.
CO 4	Implement IIR and FIR filters using different structures.
CO 5	Describe the DSP Processor Architecture.

Course Instructor: JENITHA A Signature

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Course3: Principles of Communication Systems **Course3 Code: 18EC53**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Design simple systems for generating and demodulating AM, DSB, SSB and VSB signals.
CO 2	Understand the concepts in Angle modulation for the design of communication systems.
CO 3	Design simple systems for generating and demodulating frequency modulated signals.
CO 4	Learn the concepts of random process and various types of noise
CO 5	Evaluate the performance of the communication system in presence of noise
CO 6	Analyze pulse modulation and sampling techniques

Dr. KN PALANISWAMY
Course Instructor:

Signature

Course4: Information Theory & Coding **Course4 Code: 18EC54**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Design the channel performance using Information theory of a random variable from its probability distribution.
CO 2	Apply various encoding scheme for data representation.
CO 3	Analyze and verify the shannan's theorem for continuous and discrete communication channels using input, output and joint probabilities.
CO 4	Apply linear block codes and cyclic codes for error detection and correction.
CO 5	Apply convolution codes for data error correction, BCH & Golay codes for Channel performance improvement against burst errors.

Rajesh Kumar Kaushal
Course Instructor:

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Course5: Electromagnetics **Course5 Code: 18EC55**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Evaluate problems on electrostatic force, electric field due to point linear, volume charges by applying conventional methods and charge in a volume
CO 2	Apply Gauss law to evaluate Electric fields due to different charge distributions by using Divergence theorem.
CO 3	Determine potential and energy with respect to point and capacitance using place Laplace equation and Apply Biot-Savart's and Ampere's laws for evaluating Magnetic field for different current configurations.
CO 4	Calculate magnetic force, potential energy and Magnetization with respect to magnetic materials and voltage induced in electric circuits.
CO 5	Apply Maxwell's equations for time varying fields, EM waves in free space and conductors and Evaluate power associated with EM waves using pointing theorem.

Course Instructor: SHASHIKIRAN S Signature

Course6: Verilog HDL **Course6 Code: 18EC56**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Write Verilog programs in gate, dataflow (RTL), behavioral and switch modeling levels of Abstraction.
CO 2	Design and verify the functionality of digital circuit/system using test benches.
CO 3	Identify the suitable Abstraction level for a particular digital design.
CO 4	Develop the programs more effectively using Verilog tasks and directives.
CO 5	Write simple programs in VHDL in different styles.

Course Instructor: TAMILVANI.R. Signature

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Course7: Digital Signal Processing Laboratory **Course7 Code: 18ECL57**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Understand the concepts of analog to digital conversion of signals and frequency domain sampling of signals.
CO 2	Modeling of discrete time signals and systems and verification of its properties and results.
CO 3	Implementation of discrete computations using DSP processor and verify the results.
CO 4	Realize the digital filters using a simulation tool and a DSP processor and verify the frequency and phase response

JENITHA A
Course Instructor:

Signature

Course8: HDL Laboratory **Course8 Code: 18ECL58**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Write the Verilog / VHDL programs to simulate Combinational circuits in Dataflow, Behavioral and Gate level Abstractions.
CO 2	Describe sequential circuits like flip flops and counters in Behavioral description and obtain simulation waveforms.
CO 3	Synthesize Combinational and Sequential circuits on programmable ICs and test the hardware.
CO 4	Interface the hardware to the programmable chips and obtain the required output.

Course Instructor: TAMILVANAN . R

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Semester: 6

Course1: Digital Communication **Course1 Code: 18EC61**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Understand the mathematical representation of signal, symbol, noise and channels.
CO 2	Apply the concept of signal conversion to symbols and signal processing to symbols in transmitter and receiver functional blocks.
CO 3	Compute performance issues and parameters for symbol processing and recovery in ideal and corrupted channel conditions.
CO 4	Compute performance parameters and mitigate for these parameters in corrupted and distorted channel conditions.

Course Instructor: Nandini.GN Signature: Nandini

Course2: Embedded Systems **Course2 Code: 18EC62**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Describe the architectural features and instructions of 32 bit microcontroller ARM cortex M3.
CO 2	Apply the knowledge gained for Programming ARM Cortex M3 for different applications.
CO 3	Describe the basic hardware components and their selection methods based on the characteristics and attributes of an embedded system.
CO 4	Develop the hardware/software co-design and firmware design approaches and explains the need of real time operating system for embedded system

Jesudas.T
Course Instructor:

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Course3: Microwave and Antennas **Course3 Code: 18EC63**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Describe structural and operational characteristics of microwave tubes
CO 2	Analyze various parameters related to microwave transmission lines and waveguides
CO 3	Describe various antenna types and its applications
CO 4	Analyze the structure radiation pattern, characteristics of antenna
CO 5	Analyze various antenna parameters which are necessary for building an RF system.

Course Instructor: Vijaya Bharathi. Signature Vijaya Bharathi.

Course4: Python Application Programming **Course4 Code: 18EC646**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Examine Python syntax and semantics and be fluent in the use of python flow control and functions.
CO 2	Demonstrate proficiency in handling strings and file systems.
CO 3	Create, run and manipulate python programs using core data structures like Lists, Dictionaries and Regular expressions.
CO 4	Interpret the concepts of Object oriented programming as used in python.
CO 5	Implement exemplary applications related to Network programming, web services and databases in Python.

Course Instructor: Srinivas Babu N Signature

Vijaya Bharathi.
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Course5: Renewable Energy Resources **Course5 Code: 18EC653**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Illustrate the need of energy conversion and the various methods of energy storage.
CO 2	Estimate the solar energy utilization, principle involved in collection and conversion of solar energy into electrical energy.
CO 3	Explore the concept involved in wind, geothermal and hydrogen energy conversion system by studying its components types and performance.
CO 4	Explain waste recycling, bio gas generation and its impact on environment.
CO 5	Acquire knowledge on ocean thermal and tidal energy its mechanism of production and its application.

Course Instructor: TAMILVANI. R. Signature

Course6: Embedded Systems Laboratory **Course6 Code: 18ECL66**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Understand the instruction set of 32 bit microcontroller ARM Cortex M3, and the software tool required for programming in Assembly and C language.
CO 2	Develop assembly language programs using ARM Cortex M3 for different applications.
CO 3	Interface external devices and I/O with ARM Cortex M3.
CO 4	Develop C language programs and library functions for embedded system applications.

Jesudas.T
Course Instructor:

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Course7: Communication Laboratory **Course7 Code: 18ECL67**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Design and test the digital modulation & demodulation circuits and display the Waveforms.
CO 2	Determine the characteristics and response of microwave device, micro strip and compute the parameters associated with it.
CO 3	Simulate the digital modulation schemes with the display of waveforms and Computation of performance parameters.

Course Instructor: Signature

Course8: Mini Project **Course8 Code: 18ECM68**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Implement electronic hardware and software by learning the design techniques, testing, troubleshooting, etc.,
CO 2	Know the key stages in development of the Project work.
CO 3	Understand methodologies and professional way of documentation and communication.

Course Instructor: Dr. Jeniitha A Signature

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Semester: 7

Course1: Microwave and Antennas **Course1 Code: 17EC71**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Describe structural and operational characteristics of microwave tubes.
CO 2	Analysis of various parameters related to microwave transmission lines and waveguides.
CO 3	Describe various antenna types and its applications.
CO 4	Analyze the structure radiation pattern, characteristics of antenna.
CO 5	Analyze various antenna parameter which are necessary for building an RF system.

VIJAYA BHARATHI
Course Instructor:

Signature 01/09/2020

Course2: Digital Image Processing **Course2 Code: 17EC72**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Explain the fundamental steps involved in image processing and components of an image processing system.
CO 2	Apply image processing techniques in both the spatial and frequency domains.
CO 3	Apply image processing techniques like restoration, wavelets, segmentation, morphological processing etc.., to increase the quality of the image.
CO 4	Conduct independent study and analysis of image enhancement techniques using matlab, python.

Jesudas.T
Course Instructor:

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Course3: Power Electronics **Course3 Code: 17EC73**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Describe the characteristics of different power semiconductors device and identify the various application of the devices.
CO 2	Analyze various power converters with different loads.
CO 3	Analyze the output response of different types of power device switches.
CO 4	Design different circuits to turn On and turn Off the thyristors.

Course Instructor: Manjushree K Chavan Signature

Course4: Biomedical Signal Processing **Course4 Code: 17EC742**

Course Outcomes: After studying this course, the students will be able to:

CO 1	To possess the basic mathematical, scientific and computational skills necessary to analyse ECG and EEG signals.
CO 2	To Apply classical and modern filtering and compression techniques for ECG and EEG signals.
CO 3	To Develop a thorough understanding on basis of ECG and EEG feature Extraction.

Course Instructor: MOHANA.C Signature mohana.c.

Course5: Satellite Communication **Course7 Code: 17EC755**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Describe the satellite orbits and its trajectories with the definitions of parameters associated with it.
CO 2	Analyze the electronic hardware systems with the satellite subsystem and earth station.
CO 3	Explain the various applications of satellite with the focus on national satellite system.
CO 4	Compute the satellite link parameters under various propagation conditions with illustration of multiple access techniques.

Course Instructor: Srinivas Babu N Signature

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Course6: Advanced Communication Laboratory **Course8 Code: 17ECL76**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Design and test the digital modulation circuits/systems and display the waveforms.
CO 2	Determine the characteristics and response of microwave devices and optical waveguide.
CO 3	Determine the characteristics of microstrip antennas and devices and compute the parameters associated with it.
CO 4	Simulate the digital modulation schemes with the display of waveforms and computation of performance parameters.

Srinivas Babu N
Course Instructor:

Signature

Course7: VLSI Laboratory **Course8 Code: 17ECL77**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Write test bench to simulate various digital circuits.
CO 2	Interpret concepts of DC Analysis, AC Analysis and Transient Analysis in analog Circuits.
CO 3	Design and simulate basic CMOS circuits like inverter, common source amplifier and differential amplifiers.
CO 4	Use basic amplifiers and further design higher level circuits like operational amplifier and analog/digital converters to meet desired parameters.

Course Instructor: Jesudas. T

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Semester: 8

Course1: Wireless Cellular and LTE 4G Broadband **Course1 Code: 17EC81**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Understand the system architecture and the functional standard specified in LTE 4G.
CO 2	Analyze the role of LTE radio interface protocols and EPS Data convergence Protocols to set up, reconfigure and release data and voice from users.
CO 3	Demonstrate the UTRAN and EPS handling processes from set up to release Including mobility management for a variety of data call scenarios.
CO 4	Test and Evaluate the Performance of resource management and packet data Processing and transport algorithms.

Dr. K.M. PALANISWAMY
Course Instructor:

Signature

Course2: Fiber Optics & Networks **Course2 Code: 17EC82**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Describe optical fiber Communication system with different modes of signal propagation.
CO 2	Describe the transmission characteristics and losses in optical fiber communication.
CO 3	Describe the construction and working principle of optical connectors, multiplexers and amplifiers.
CO 4	Enumerate the constructional features and the characteristics of optical sources and detectors.
CO 5	Illustrate the networking aspects of optical fiber and describe various standards associated with it.

Dr. BHUVANENDHIRAN. T
Course Instructor:

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Course3: Machine learning **Course3 Code: 17EC834**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Recognize the characteristics of Machine Learning that make it useful to Real world problems.
CO 2	Design various Machine Learning Algorithms to data.
CO 3	Apply Artificial Intelligence techniques by using Neural Network and Search Algorithm.
CO 4	Analyze Statistical inferences for a hypothesis as more evidence becomes available.
CO 5	Evaluate hypothesis and investigate Instant Based Learning and Reinforced Learning.

Course Instructor: Manjushree K Charan Signature

Course4: Internship/Professional Practice **Course4 Code: 17EC84**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Identify and use appropriate methods to validate solutions to Engineering problems.
CO 2	Apply engineering design process to solve computer networking problems.

Course Instructor: Manjushree K Charan Signature

Course5: Project Work **Course5 Code: 17ECP85**

Course Outcomes: After studying this course, the students will be able to:

CO 1	Describe the engineering technical models based on society environment and ethics as a team
CO 2	Describe the problem, write the reports, documentations and presentation, and illustrate the management principles through dissertation work
CO 3	Explain the professional ethics in engineering practice, analyze the solution by considering suitable design

Course Instructor: Jeuitha A Signature

HOD 1/9/2020

Head of the Department
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Course6: Seminar **Course6 Code: 17ECS86**

Course Outcomes: After studying this course, the students will be able to:

CO 1	To study research papers for understanding of a new field, in the absence of a text book, to Summaries and review them.
CO 2	To identify promising new directions of various cutting edge technologies
CO 3	To impart skills in preparing detailed report describing the project and results
CO 4	To effectively communicate by making an oral presentation before an evaluation committee.

Course Instructor: DY-KM-PALANISWAMY Signature

HOD

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