# ACHARYA INSTITUTE OF TECHNOLOGY

## Dept. of ECE

Bengaluru

| DEPARTMENT | ECE | SEMESTER | 3 | COURSE CODE | 18EC32 | COURSE ID | C202 |
|---|---|---|---|---|---|---|---|
| COURSE TITLE | | NETWORK THEORY | | | | | |
| COURSE OUTCOME NO | | COURSE OUTCOME STATEMENTS | | | | | |
| C202.1 | | Simplify the complex networks using network reduction and source conversion techniques. | | | | | |
| C202.2 | | Solve for different electrical network variables using Mesh and Nodal Analysis. | | | | | |
| C202.3 | | Apply the network theorems to determine AC/DC network variables. | | | | | |
| C202.4 | | Analyze the performance of electrical network for a given set of initial conditions. | | | | | |

| DEPARTMENT | ECE | SEMESTER | 3 | COURSE CODE | 18EC33 | COURSE ID | C203 |
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| COURSE TITLE | | ELECTRONIC DEVICES | | | | | |
| COURSE OUTCOME NO | | COURSE OUTCOME STATEMENTS | | | | | |
| C203.1 | | Explain the structure of semiconductor materials and devices | | | | | |
| C203.2 | | Diescribe the characteristics and parameters of different types of semiconductor devices | | | | | |
| C203.3 | | Compute the equivalent models and parameters of different semiconductor device | | | | | |
| C203.4 | | Discuss fabrication process of semiconductor devices | | | | | |

| DEPARTMENT | ECE | SEMESTER | 3 | COURSE CODE | 18EC34 | COURSE ID | C204 |
|---|---|---|---|---|---|---|---|
| COURSE TITLE | | DIGITAL SYSTEM DESIGN | | | | | |
| COURSE OUTCOME NO | | COURSE OUTCOME STATEMENTS | | | | | |
| C204.1 | | Describe different combinational and sequential logic circuits using logic gates. | | | | | |
| C204.2 | | Apply various minimization techniques for simplification of Boolean functions to study digital circuits. | | | | | |
| C204.3 | | Design combinational and sequential circuits for given specifications. | | | | | |
| C204.4 | | Construct the state diagram for synchronous sequential circuits using state machine notation. | | | | | |

| DEPARTMENT | ECE | SEMESTER | 3 | COURSE CODE | 18EC35 | COURSE ID | C205 |
|---|---|---|---|---|---|---|---|
| COURSE TITLE | | COMPUTER ORGANISATION & ARCHITECTURE | | | | | |
| COURSE OUTCOME NO | | COURSE OUTCOME STATEMENTS | | | | | |

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| **C205.1** | Describe basic organization and functional units of computer with its instruction set architecture |
| **C205.2** | Illustrate computer arithmetic operations on integers and floating-point numbers using 2's complement and IEEE floating point representation. |
| **C205.3** | Apply suitable control sequence to complete data transfer, arithmetic and logical operations |
| **C205.4** | Analyze different ways of accessing an input / output device including interrupts. |

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| **DEPARTMENT** | **ECE** | **SEMESTER** | **3** | **COURSE CODE** | **18EC36** | **COURSE ID** | **C206** |
| **COURSE TITLE** | | **POWER ELECTRONICS & INSTRUMENTATION** | | | | | |
| **COURSE OUTCOME NO** | | **COURSE OUTCOME STATEMENTS** | | | | | |
| **C206.1** | | Describe the power devices, triggering circuits, converters and their applications. | | | | | |
| **C206.2** | | Compute the design parameters of controlled rectifier, DC to DC converters, DC to AC inverters and SMPS. | | | | | |
| **C206.3** | | Describe the principle of operation of Digital instruments and PLCs. | | | | | |
| **C206.4** | | Compute the design parameters of multi-range Ammeters, Voltmeters and Bridges to measure passive component values and frequency. | | | | | |

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| **DEPARTMENT** | **ECE** | **SEMESTER** | **3** | **COURSE CODE** | **18ECL37** | **COURSE ID** | **C207** |
| **COURSE TITLE** | | **ELECTRONIC DEVICES LAB** | | | | | |
| **COURSE OUTCOME NO** | | **COURSE OUTCOME STATEMENTS** | | | | | |
| **C207.1** | | Design/verify circuit with given specification. | | | | | |
| **C207.2** | | Conduct / Simulate circuit with given specification for functional verification | | | | | |
| **C207.3** | | Tabulate and validate the readings and infer the results graphically. | | | | | |
| **C207.4** | | Interpret the concepts and results both orally and written. | | | | | |

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| **DEPARTMENT** | **ECE** | **SEMESTER** | **3** | **COURSE CODE** | **18ECL38** | **COURSE ID** | **C208** |
| **COURSE TITLE** | | **DIGITAL SYSTEM DESIGN LAB** | | | | | |
| **COURSE OUTCOME NO** | | **COURSE OUTCOME STATEMENTS** | | | | | |
| **C208.1** | | Design / Write the program with given specification. | | | | | |
| **C208.2** | | Conduct / Simulate the experiments with given specification. | | | | | |
| **C208.3** | | Tabulate and validate the readings and infer the results graphically. | | | | | |
| **C208.4** | | Interpret the concepts and results both orally and written. | | | | | |

| DEPARTMENT | ECE | SEMESTER | 4 | COURSE CODE | 18EC42 | COURSE ID | C212 |
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| COURSE TITLE | | ANALOG CIRCUITS | | | | | |
| COURSE OUTCOME NO | | COURSE OUTCOME STATEMENTS | | | | | |
| C212.1 | | Explain the biasing of BJTs/MOSFETs, working of oscillators and functioning of linear ICs. | | | | | |
| C212.2 | | Compute the values of various parameters in linear and nonliear BJT/MOSFET circuits. | | | | | |
| C212.3 | | Analyze the power and feedback amplifier circuits. | | | | | |
| C212.4 | | Design of Linear IC based circuits | | | | | |
| DEPARTMENT | ECE | SEMESTER | 4 | COURSE CODE | 18EC43 | COURSE ID | C213 |
| COURSE TITLE | | CONTROL SYSTEMS | | | | | |
| COURSE OUTCOME NO | | COURSE OUTCOME STATEMENTS | | | | | |
| C213.1 | | Develop mathematical modeling for simple mechanical & electrical systems by applying block diagram reduction techniques & Signal Flow Graph | | | | | |
| C213.2 | | Analyze the given first & second order systems under time & frequency domain | | | | | |
| C213.3 | | Evaluate the stability of the system with the aid of Bode Plots, Nyquist Plot & Root Locus | | | | | |
| C213.4 | | Evaluate the state variables & obtain the solution for state equations. | | | | | |
| DEPARTMENT | ECE | SEMESTER | 4 | COURSE CODE | 18EC44 | COURSE ID | C214 |
| COURSE TITLE | | ENGINEERING STATISTICS & LINEAR ALGEBRA | | | | | |
| COURSE OUTCOME NO | | COURSE OUTCOME STATEMENTS | | | | | |
| C214.1 | | Describe Single/Multiple Random Variables, and their extension to Random Process. | | | | | |
| C214.2 | | Compute the quantitative parameters for functions of single Random variable, Multiple Random Variables and Random Process. | | | | | |
| C214.3 | | Determine the rank, determinant, eigen-values and eigenvectors, Diagonalization and different factorizations of a matrix. | | | | | |
| C214.4 | | Verify the existence and uniqueness of the solution of a linear system, special properties of a matrix such as symmetric , Hermitian , positive definite, etc. | | | | | |
| DEPARTMENT | ECE | SEMESTER | 4 | COURSE CODE | 18EC45 | COURSE ID | C215 |
| COURSE TITLE | | SIGNALS & SYSTEMS | | | | | |
| COURSE OUTCOME NO | | COURSE OUTCOME STATEMENTS | | | | | |
| C215.1 | | Perform linear and nonlinear operations on signals and systems to identify its properties | | | | | |
| C215.2 | | Compute the output of LTI system using Convolution integral/Sum and Impulse response | | | | | |
| C215.3 | | Apply Fourier representation/ZT to study the behavior of periodic and non-periodic signals. | | | | | |
| C215.4 | | Analyze the behavior of continuous/ Discrete LTI systems in Frequency/ZT domain | | | | | |
| DEPARTMENT | ECE | SEMESTER | 4 | COURSE | 18EC46 | COURSE ID | C216 |

| COURSE TITLE | MICROCONTROLLERS |
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| COURSE OUTCOME NO | COURSE OUTCOME STATEMENTS |
| C216.1 | Explain the internal organization and operation of microcontroller |
| C216.2 | Describe various instruction set and addressing modes of 8051 Microcontroller |
| C216.3 | Write assembly language programs using instruction set addressing modes of 8051 microcontroller |
| C216.4 | Develop embedded system using C programming for 8051 based microcontroller to interface with I/O devices. |

| DEPARTMENT | ECE | SEMESTER | 4 | COURSE | 18ECL47 | COURSE ID | C217 |
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| COURSE TITLE | MICROCONTROLLER LAB |
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| COURSE OUTCOME NO | COURSE OUTCOME STATEMENTS |
| C217.1 | Write the program with given specification |
| C217.2 | Demonstrate / Simulate the experiments with given specification |
| C217.3 | Tabulate and validate the readings and infer the results. |
| C217.4 | Interpret the concepts and results both orally and written. |

| DEPARTMENT | ECE | SEMESTER | 4 | COURSE | 18ECL48 | COURSE ID | C218 |
|---|---|---|---|---|---|---|---|

| COURSE TITLE | ANALOG CIRCUITS LAB |
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| COURSE OUTCOME NO | COURSE OUTCOME STATEMENTS |
| C218.1 | Design/verify opamp, BJT /FET based circuit with given specification. |
| C218.2 | Test / Simulate circuit with given specification for functional verification. |
| C218.3 | Tabulate and infer the results obtained either graphically or logically. |
| C218.4 | Interpret the concepts and results both orally and written. |

| DEPARTMENT | ECE | SEMESTER | 5 | COURSE | 18ES51 | COURSE ID | C301 |
|---|---|---|---|---|---|---|---|

| COURSE TITLE | TECHNOLOGICAL INNOVATION & MANAGEMENT ENTREPRENEURSHIP |
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| COURSE OUTCOME NO | COURSE OUTCOME STATEMENTS |
| C301.1 | Discuss the Fundamental concepts of Management & Entrepreneurship & opportunities in order to set up a business |
| C301.2 | Explain the functions of managers, entrepreneurs and their social responsibilities |
| C301.3 | Analyze various case studies related to concepts of Managements & Entrepreneurship |

| DEPARTMENT | ECE | SEMESTER | 5 | COURSE | 18EC52 | COURSE ID | C302 |
|---|---|---|---|---|---|---|---|

| COURSE TITLE | DIGITAL SIGNAL PROCESSING |
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| COURSE OUTCOME NO | COURSE OUTCOME STATEMENTS |
| C302.1 | |
| C302.2 | |

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| **C302.3** | |
| **C302.4** | |

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| **DEPARTMENT** | **ECE** | **SEMESTER** | **5** | **COURSE** | **18EC53** | **COURSE ID** | **C303** |
| **COURSE TITLE** | | **PRINCIPLES OF COMMUNICATION SYSTEM** | | | | | |
| **COURSE OUTCOME NO** | | **COURSE OUTCOME STATEMENTS** | | | | | |
| **C303.1** | | Explain the fundamental concept of different modulation and demodulation techniques used in analog communication. | | | | | |
| **C303.2** | | Explain the fundamental concept of different modulation and demodulation techniques used in analog communication. | | | | | |
| **C303.3** | | Analyze the performance of the analog communication system in the presence of noise. | | | | | |
| **C303.4** | | Analyze the performance of digital formatting processes with quantization noise. | | | | | |

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| **DEPARTMENT** | **ECE** | **SEMESTER** | **5** | **COURSE** | **18EC54** | **COURSE ID** | **C304** |
| **COURSE TITLE** | | **INFORMATION THEORY AND CODING** | | | | | |
| **COURSE OUTCOME NO** | | **COURSE OUTCOME STATEMENTS** | | | | | |
| **C304.1** | | Apply the concept probability theory for study of discrete information source. | | | | | |
| **C304.2** | | Apply various source encoding techniques to measure efficiency and redundancy of information source. | | | | | |
| **C304.3** | | Compute the channel capacity & efficiency of discrete/continuous channels in presence and absence of Noise. | | | | | |
| **C304.4** | | Design encoders/decoders for linear block codes, Cyclic codes & Convolution Codes. | | | | | |

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| **DEPARTMENT** | **ECE** | **SEMESTER** | **5** | **COURSE** | **18EC55** | **COURSE ID** | **C305** |
| **COURSE TITLE** | | **ELECTROMAGNETIC WAVES** | | | | | |
| **COURSE OUTCOME NO** | | **COURSE OUTCOME STATEMENTS** | | | | | |
| **C305.1** | | solve problems on electrostatic force, electric field due to point, linear, volume charges by applying conventional methods and charge in a volume.<br>Apply Gauss law to evaluate Electric fields due to different charge distributions and Volume Charge distribution by using Divergence Theorem. | | | | | |
| **C305.2** | | Determine potential and energy with respect to point charge and capacitance using Laplace equation , Magnetic field for different current configurations using Biot-Savart's and Ampere's laws. | | | | | |
| **C305.3** | | Compute magnetic force, potential energy and Magnetization with respect to magnetic materials and voltage induced in electric circuits. | | | | | |
| **C305.4** | | Apply Maxwell's equations for time varying fields, EM waves in free space and conductors and<br>Evaluate power associated with EM waves using Poynting theorem | | | | | |

| DEPARTMENT | ECE | SEMESTER | 5 | COURSE | 18EC56 | COURSE ID | C306 |
|---|---|---|---|---|---|---|---|
| COURSE TITLE | | VERILOG HDL | | | | | |
| COURSE OUTCOME NO | | COURSE OUTCOME STATEMENTS | | | | | |
| C306.1 | | Illustrate HDL constructs and Identify the suitable abstraction level for modeling digital circuits. | | | | | |
| C306.2 | | Design and verify the functionality of digital circuits using test benches. | | | | | |
| C306.3 | | Interpret the various constructs in logic synthesis. | | | | | |
| C306.4 | | Write the programs more effectively using Verilog tasks, functions and directives. | | | | | |

| DEPARTMENT | ECE | SEMESTER | 5 | COURSE | 18ECL57 | COURSE ID | C307 |
|---|---|---|---|---|---|---|---|
| COURSE TITLE | | DSP LAB | | | | | |
| COURSE OUTCOME NO | | COURSE OUTCOME STATEMENTS | | | | | |
| C307.1 | | Write programs to simulate/implement DSP concepts like, discrete computations and digital filters | | | | | |
| C307.2 | | Simulate/Implement discrete computations on signals/systems and verify its properties | | | | | |
| C307.3 | | Simulate/Implement digital IIR and FIR filters and verify its frequency response | | | | | |
| C307.4 | | Communicate the results both orally and written | | | | | |

| DEPARTMENT | ECE | SEMESTER | 5 | COURSE | 18ECL58 | COURSE ID | C308 |
|---|---|---|---|---|---|---|---|
| COURSE TITLE | | HDL LAB | | | | | |
| COURSE OUTCOME NO | | COURSE OUTCOME STATEMENTS | | | | | |
| C308.1 | | Write Verilog HDL code using different levels of abstraction for modeling digital designs. | | | | | |
| C308.2 | | Simulate HDL code & verify the functionality of digital circuits using test bench | | | | | |
| C308.3 | | Synthesize,Implement and Validate the digital designs on FPGA. | | | | | |
| C308.4 | | Interpret the concepts and results both orally and written. | | | | | |

| DEPARTMENT | ECE | SEMESTER | 6 | COURSE | 18EC61 | COURSE ID | C311 |
|---|---|---|---|---|---|---|---|
| COURSE TITLE | | DIGITAL COMMUNICATION | | | | | |
| COURSE OUTCOME NO | | COURSE OUTCOME STATEMENTS | | | | | |
| C311.1 | | Apply the knowledge of Spectral Analysis, theory of detection and estimation in DCS. | | | | | |
| C311.2 | | Analyze digital modulation schemes, ISI and Spread Spectrum techniques | | | | | |
| C311.3 | | Determine the power spectral densities of line codesand performance parameters of digital modulation techniques. | | | | | |

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| **C311.4** | Estimate the design parameters of a digital receivers and spread spectrum systems. |

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| **DEPARTMENT** | **ECE** | **SEMESTER** | **6** | **COURSE** | **18EC62** | **COURSE ID** | **C312** |
| **COURSE TITLE** | | **ARM MICROCONTROLLER AND EMBEDDED SYSTEMS** | | | | | |
| **COURSE OUTCOME NO** | | **COURSE OUTCOME STATEMENTS** | | | | | |
| **C312.1** | | Describe the architecture of ARM processors, Memory types and principles of RTOS | | | | | |
| **C312.2** | | Explain ARM cortex M3 instruction set. | | | | | |
| **C312.3** | | Write an ALP by making use of appropriate instructions. | | | | | |
| **C312.4** | | Analyze the performance of scheduling algorithms used in RTOS. | | | | | |

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| **DEPARTMENT** | **ECE** | **SEMESTER** | **6** | **COURSE** | **18EC63** | **COURSE ID** | **C313** |
| **COURSE TITLE** | | **MICROWAVE & ANTENNA** | | | | | |
| **COURSE OUTCOME NO** | | **COURSE OUTCOME STATEMENTS** | | | | | |
| **C313.1** | | Describe the active & passive microwave devices used in Microwave communication systems. | | | | | |
| **C313.2** | | Compute various parameters related to transmission lines, microwave devices and antenna for building an RF system using S-parameters, Signal flow graphs and Smith charts. | | | | | |
| **C313.3** | | Analyze the performance of the microwave devices (active & passive) and different type of antenna for various application. | | | | | |
| **C313.4** | | Design and analyze antenna and antenna array as per the requirements. | | | | | |

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| **DEPARTMENT** | **ECE** | **SEMESTER** | **6** | **COURSE** | **18EC643** | **COURSE ID** | **C314** |
| **COURSE TITLE** | | **DATA STRUCTURES USING C++** | | | | | |
| **COURSE OUTCOME NO** | | **COURSE OUTCOME STATEMENTS** | | | | | |
| **C314.1** | | Describe the fundamental concepts of arrays, pointers, and linked lists using C++. | | | | | |
| **C314.2** | | Be able to apply arrays and linked list concepts to design and analyze stacks, queues and applications of these data structures to real time applications | | | | | |
| **C314.3** | | Be able to apply arrays and linked list concepts to design and analyze the skip lists, binary trees and applications of these data structures to real time applications | | | | | |
| **C314.4** | | Be able to apply arrays and linked list concepts to design and analyze the priority queues, binary search trees and applications of these data structures to real time applications | | | | | |

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| **DEPARTMENT** | **ECE** | **SEMESTER** | **6** | **COURSE** | **18EC646** | **COURSE ID** | **C315** |
| **COURSE TITLE** | | **PYTHON APPLICATION PROGRAMMING** | | | | | |
| **COURSE OUTCOME NO** | | **COURSE OUTCOME STATEMENTS** | | | | | |
| **C315.1** | | Describe the essential features Python programming language | | | | | |
| **C315.2** | | Illustrate the Python specific features such as Lists, Tuples, sets etc. | | | | | |

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| **C315.3** | Write Python programs using conditional statements, functions, and libraries such as beautifulsoup, urllib, httplib, socket programming, xml, json, sql etc. |
| **C315.4** | Employ the applicability of suitable Python features to solve a given problem statement. |

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| **DEPARTMENT** | **ECE** | **SEMESTER** | **6** | **COURSE** | **18ECL66** | **COURSE ID** | **C316** |
| **COURSE TITLE** | | **EMBEDDED SYSTEM LAB** | | | | | |
| **COURSE OUTCOME NO** | | **COURSE OUTCOME STATEMENTS** | | | | | |
| **C316.1** | | Identify the ARM Cortex M3 Microcontroller Instruction Set and Hardware devices. | | | | | |
| **C316.2** | | Demonstrate the Instruction set of ARM cortex M3 Microcontroller in Programming. | | | | | |
| **C316.3** | | Experiment the working of Peripheral devices with ARM Cortex M3 Microcontroller. | | | | | |

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| **DEPARTMENT** | **ECE** | **SEMESTER** | **6** | **COURSE** | **18ECL67** | **COURSE ID** | **C317** |
| **COURSE TITLE** | | **COMMUNICATION LAB** | | | | | |
| **COURSE OUTCOME NO** | | **COURSE OUTCOME STATEMENTS** | | | | | |
| **C317.1** | | Design/Write the program with given specification for: various types of Digital transmission & receiption techniques, Antennas, Microwave devices and Optical Waveguides. | | | | | |
| **C317.2** | | Demonstrate /Simulate the experiments/program to meet the given specification. | | | | | |
| **C317.3** | | Compute (or Determine) the various parameters of micro strip resonators, coupler's and optical fibers. | | | | | |
| **C317.4** | | Interpret the concepts and results both orally & written for the conducted experiment. | | | | | |

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| **DEPARTMENT** | **ECE** | **SEMESTER** | **6** | **COURSE** | **18ECMP 68** | **COURSE ID** | **C318** |
| **COURSE TITLE** | | **MINI PROJECT** | | | | | |
| **COURSE OUTCOME NO** | | **COURSE OUTCOME STATEMENTS** | | | | | |
| **C318.1** | | Demonstrate an ability to identify and formulate a hypothesis for a given problem and test through appropriate experiments. | | | | | |
| **C318.2** | | Apply relevant modern tools to solve the identified technical problem. | | | | | |
| **C318.3** | | Analyze and evaluate the experimental results and propose suitable modifications to improve performance. | | | | | |
| **C318.4** | | Work effectively as a member or a leader of a team. | | | | | |
| **C318.5** | | Communicate technical content effectively through written reports and oral presentations. | | | | | |

| DEPARTMENT | ECE | SEMESTER | 7 | COURSE CODE | 18EC71 | COURSE ID | C401 |
|---|---|---|---|---|---|---|---|
| COURSE TITLE | | COMPUTER NETWORKS | | | | | |
| COURSE OUTCOME NO | | COURSE OUTCOME STATEMENTS | | | | | |
| C401.1 | | Apply the knowledge of network components, Frame formats & functionalities for data transmission. | | | | | |
| C401.2 | | Make use of routing protocols for a given network topology to send data through optimal path. | | | | | |
| C401.3 | | Analyze/Apply different access techniques and protocols in Data link Layer. | | | | | |
| C401.4 | | Design Subnet masks and address for a given network. | | | | | |

| DEPARTMENT | ECE | SEMESTER | 7 | COURSE CODE | 18EC72 | COURSE ID | C402 |
|---|---|---|---|---|---|---|---|
| COURSE TITLE | | VLSI DESIGN | | | | | |
| COURSE OUTCOME NO | | COURSE OUTCOME STATEMENTS | | | | | |
| C402.1 | | Explain the characteristics, parameters of MOS circuits and CMOS fabrication process. | | | | | |
| C402.2 | | Apply design rules to draw schematic and layout of CMOS circuits. | | | | | |
| C402.3 | | Design of Combinational , Sequential and Dynamic logic Circuits | | | | | |
| C402.4 | | Compute the performance of CMOS circuits in terms of memory, speed, power and area. | | | | | |

| DEPARTMENT | ECE | SEMESTER | 7 | COURSE CODE | 18EC732 | COURSE ID | C403 |
|---|---|---|---|---|---|---|---|
| COURSE TITLE | | SATELLITE COMMUNICATION | | | | | |
| COURSE OUTCOME NO | | COURSE OUTCOME STATEMENTS | | | | | |
| C403.1 | | Describe the satellite orbits and its trajectories with the definitions of parameters associated with it.( such as signal propagation affects, link design, rain fading and link availability and perform interference) | | | | | |
| C403.2 | | Illustrate the importance of the Earth segment and its relation to the DBS TV. | | | | | |
| C403.3 | | Compute the satellite orbital and link parameters under various propagation conditions with the illustration of multiple access techniques. | | | | | |
| C403.4 | | Analyze the importance and performance of space segment equipment’s and earth segment equipment used in satellite systems. | | | | | |

| DEPARTMENT | ECE | SEMESTER | 7 | COURSE CODE | 18EC733 | COURSE ID | C404 |
|---|---|---|---|---|---|---|---|
| COURSE TITLE | | DIGITAL IMAGE PROCESSING | | | | | |
| COURSE OUTCOME NO | | COURSE OUTCOME STATEMENTS | | | | | |
| C404.1 | | "Use Image Enhancement and Restoration Techniques for required Visualization. " | | | | | |
| C404.2 | | "Apply Morphological operations and Segmentation techniques for extracting useful information from Image. | | | | | |

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| **C404.3** | Compare various Enhancement/Morphological/Segmentation Techniques in Spatial and Frequency domain. |
| **C404.4** | Choose appropriate Image processing technique for different applications. |

| **DEPARTMENT** | **ECE** | **SEMESTER** | **7** | **COURSE CODE** | **18EC745** | **COURSE ID** | **C405** |
|---|---|---|---|---|---|---|---|
| **COURSE TITLE** | | **MACHINE LEARNING** | | | | | |
| **COURSE OUTCOME NO** | | **COURSE OUTCOME STATEMENTS** | | | | | |
| **C405.1** | | Describe the concepts and issues associated with machine learning algorithms. | | | | | |
| **C405.2** | | Apply machine learning algorithms to solve classification and regression task | | | | | |
| **C405.3** | | Choose suitable machine learning techniques for the application under consideration. | | | | | |
| **C405.4** | | Analyze the performance of various machine learning algorithms for different applications. | | | | | |

| **DEPARTMENT** | **ECE** | **SEMESTER** | **7** | **COURSE CODE** | **18EC741** | **COURSE ID** | **C406** |
|---|---|---|---|---|---|---|---|
| **COURSE TITLE** | | **IOT & WSN** | | | | | |
| **COURSE OUTCOME NO** | | **COURSE OUTCOME STATEMENTS** | | | | | |
| **C406.1** | | Describe the OSI model, Communication protocol, architecture and design principles used in IoT devices. | | | | | |
| **C406.2** | | Describe the architecture, hardware and software components, cloud computing infrastructure, and various protocols applicable to WSNs in IoT based applications. | | | | | |
| **C406.3** | | Illustrate the design of IoT applications using Arduino, and other relevant IDEs. | | | | | |
| **C406.4** | | Apply suitable MAC and Routing protocols in interfacing sensors with IoT infrastructure. | | | | | |

| **DEPARTMENT** | **ECE** | **SEMESTER** | **7** | **COURSE CODE** | **18ECL76** | **COURSE ID** | **C407** |
|---|---|---|---|---|---|---|---|
| **COURSE TITLE** | | **COMPUTER NETWORKS LAB** | | | | | |
| **COURSE OUTCOME NO** | | **COURSE OUTCOME STATEMENTS** | | | | | |
| **C407.1** | | Write NS2/C program to implement different networking concepts. | | | | | |
| **C407.2** | | Execute the program to meet the specified network configuration. | | | | | |
| **C407.3** | | Interpret the results of execution to simulate a given computer network | | | | | |
| **C407.4** | | Communicate the results both orally and written | | | | | |

| **DEPARTMENT** | **ECE** | **SEMESTER** | **7** | **COURSE CODE** | **18ECL77** | **COURSE ID** | **C408** |
|---|---|---|---|---|---|---|---|
| **COURSE TITLE** | | **VLSI LAB** | | | | | |

| COURSE OUTCOME NO | COURSE OUTCOME STATEMENTS |
|---|---|
| C408.1 | Design analog and digital CMOS circuits for the given specifications. |
| C408.2 | Simulate & verify the functionality of the circuits with the given specification. |
| C408.3 | Validate and infer DRC & LVC results graphically |
| C408.4 | Interpret the concepts and results both orally and written. |

| DEPARTMENT | ECE | SEMESTER | 7 | COURSE CODE | 18ECL78 | COURSE ID | C409 |
|---|---|---|---|---|---|---|---|
| COURSE TITLE | PROJECT WORK PHASE 1 | | | | | | |
| COURSE OUTCOME NO | COURSE OUTCOME STATEMENTS | | | | | | |
| C409.1 | Demonstrate an ability to identify and formulate a hypothesis for a given problem and test through appropriate experiments. | | | | | | |
| C409.2 | Apply relevant modern tools to solve the identified technical problem. | | | | | | |
| C409.3 | Analyze and evaluate the experimental results and propose suitable modifications to improve Performance | | | | | | |
| C409.4 | Work effectively as a member or a leader of a team. | | | | | | |
| C409.5 | Communicate technical content effectively through written reports and oral presentations. | | | | | | |

| DEPARTMENT | ECE | SEMESTER | 8 | COURSE CODE | 18EC81 | COURSE ID | C411 |
|---|---|---|---|---|---|---|---|
| COURSE TITLE | WIRELESS CELLULAR & LTE 4G BROADBAND | | | | | | |
| COURSE OUTCOME NO | COURSE OUTCOME STATEMENTS | | | | | | |
| C411.1 | Discuss the Basic architecture and the functional standards specified in LTE 4G. | | | | | | |
| C411.2 | Explain the system architecture of LTE and E-UTRAN based on the use of OFDMA and SC-FDMA principles. | | | | | | |
| C411.3 | Apply the concepts of UMTS UTRAN and EPS handling processes for the configuration of call processing system for variety of data call scenarios. | | | | | | |
| C411.4 | Analyze the role of LTE radio interface protocols and EPS Data convergence protocols to set up, reconfigure and release data and voice from the Subscribers. | | | | | | |

| DEPARTMENT | ECE | SEMESTER | 8 | COURSE CODE | 18EC821 | COURSE ID | C412 |
|---|---|---|---|---|---|---|---|
| COURSE TITLE | NETWORK SECURITY | | | | | | |
| COURSE OUTCOME NO | COURSE OUTCOME STATEMENTS | | | | | | |
| C412.1 | Describe various types of security attacks, security approaches, viruses, countermeasures for networked devices against attacks. | | | | | | |
| C412.2 | Identify different network protocols, which can protect networked devices against attacks | | | | | | |
| C412.3 | Illustrate the usage of Intrusion Detection System (IDS) and Firewalls in safeguarding systems against attacks | | | | | | |

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| **C412.4** | Apply different protocols (Network, Transport, application layer) to defend networked devices against possible attacks |

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| **DEPARTMENT** | **ECE** | **SEMESTER** | **8** | **COURSE CODE** | **18ECP83** | **COURSE ID** | **C413** |
| **COURSE TITLE** | | **PROJECT WORK PHASE 2** | | | | | |
| **COURSE OUTCOME NO** | | **COURSE OUTCOME STATEMENTS** | | | | | |
| **C413.1** | | Demonstrate an ability to identify and formulate a hypothesis for a given problem and test through appropriate experiments. | | | | | |
| **C413.2** | | Apply relevant modern tools to solve the identified technical problem. | | | | | |
| **C413.3** | | Analyze and evaluate the experimental results and propose suitable modifications to improve Performance | | | | | |
| **C413.4** | | Work effectively as a member or a leader of a team. | | | | | |
| **C413.5** | | Communicate technical content effectively through written reports and oral presentations. | | | | | |

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| **DEPARTMENT** | **ECE** | **SEMESTER** | **8** | **COURSE CODE** | **18ECS84** | **COURSE ID** | **C414** |
| **COURSE TITLE** | | **TECHNICAL SEMINAR** | | | | | |
| **COURSE OUTCOME NO** | | **COURSE OUTCOME STATEMENTS** | | | | | |
| **C414.1** | | Select recent advances in a specific technical field by performing a comprehensive literature survey. | | | | | |
| **C414.2** | | Compare the different solution methods, various software tools and methods for the identified problem. | | | | | |
| **C414.3** | | Discuss the advantages and disadvantages of approach, along with possible future directions. | | | | | |
| **C414.4** | | Communicate technical content effectively through written and oral presentations. | | | | | |

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| **DEPARTMENT** | **ECE** | **SEMESTER** | **8** | **COURSE CODE** | **18ECI85** | **COURSE ID** | **C415** |
| **COURSE TITLE** | | **INTERNSHIP** | | | | | |
| **COURSE OUTCOME NO** | | **COURSE OUTCOME STATEMENTS** | | | | | |
| **C415.1** | | Demonstrate Sound technical Knowledge in the chosen domain through Skill up gradation. | | | | | |
| **C415.2** | | Correlate the knowledge gained for different applications scenarios. | | | | | |
| **C415.3** | | Work as individual or as good team player in an organization. | | | | | |
| **C415.4** | | Communicate technical content effectively through written and oral presentations. | | | | | |