



Estd. 2004

## Lakshmi Narain College of Technology, Indore

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### **Branch: Electronics and Communication Engineering**

#### **Programme Educational Objectives (PEOs)**

**PEO 1. Core Knowledge** – Electronics and Communication engineering graduates will have the knowledge of basic science and Engineering skills, Humanities, social science, management and conceptual and practical understanding of core electronics engineering area with project development.

**PEO 2. Employment/ Continuing Education** - Electronics and Communication engineering graduates will have the knowledge of Industry-based technical skills to succeed in entry level engineering position at various industries as well as in academics.

**PEO 3. Professional Competency** - Electronics and Communication engineering graduates will have the ability to communicate effectively in English, to accumulate and disseminate the knowledge and to work effectively in a team with a sense of social awareness.

#### **Programme Outcomes (POs)**

Engineering Graduates will be able to:

**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

**Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

**Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

**Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

**Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and electronics as well as communication related tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

**The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

**Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

**Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

**Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

### **Programme Specific Outcomes (PSOs)**

Electronics and communication Engineering Graduates will be able to:

**PSO1.** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences along with this specific branch.

**PSO2.** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

**PSO.3** The utilization of knowledge and expertise with skills regarding Electronics and communication

Engineering and use of sustainable solution for developing projects related to Electronics and communication specification.

NAME OF SUBJECT: Electronic Device

**Course Outcomes (Cos)**

NAME OF SUBJECT: MATHEMATICS-III

SUBJECT CODE: BT301

Students will be able to

CO1 :	To introduce effective mathematical tools for the Numerical Solutions algebraic and transcendental equations.
CO2 :	To enable young technocrats to acquire mathematical knowledge to understand Laplace transformation.
CO3 :	Laplace transformation and Fourier Transform which are used in various branches of engineering.
CO4 :	To acquaint the student with mathematical tools available in Statistics needed in various field of science and engineering.
CO5 :	Student will solve Mathematics related problem.

NAME OF SUBJECT: Electronic Measurement &  
Instrumentation

SUBJECT CODE: EC302

Students will be able to

CO1 :	To understand the notion of, DC Voltmeter- Chopper type and solidstate, AC voltmeter using Rectifier. Average, RMS, Peak responding voltmeters, Multi-meter, Power meter, Bolometer and Calorimeter.
CO2 :	Students understand the basic principle of Cathode Ray Oscilloscope(CRO)
CO3 :	Be able to solve AC Bridges.
CO4 :	To enable students to perform the Classification of Transducers like RVDT & LVDT
CO5 :	Student can perform experiment on Signal and Function Generators, Sweep Frequency Generator, Pulse and Square Wave Generator, Beat Frequency Oscillator, Digital display system and indicators

NAME OF SUBJECT: Digital System Design

SUBJECT CODE: EC303

Students will be able to

CO1 :	Study of different basic digital logic gates and verification of their Truth Table.
CO2 :	Construction and Verification of different Shift Registers
CO3 :	Student implement should Logic Families and Semiconductor Memories
CO4 :	Implement construction and verification of different types of Counters.
CO5 :	Construction and verification of various combinational circuits such as Half Adder, Full Adder, Half & Full Subtractor.

SUBJECT CODE: EC304	
Students will be able to	
CO 1:	Student should plot the Characteristics curve of various clamper circuits.
CO 2:	To measure $V_{rms}$ , $V_{dc}$ for half wave, full wave & bridge rectifier.
CO 3:	Study of Special diodes: Tunnel diodes, Varactor diodes, Schottky diode, Photo diodes, Photodetector, LED, solar cell.
CO 4:	Implement Small Signal analysis: Small signal Amplifier, Amplifier Bandwidth, Hybrid model, analysis of transistor amplifier using h-parameter, Multistage Amplifier: Cascading amplifier, Boot-strapping Technique, Darlington amplifier .

NAME OF SUBJECT: Network Analysis	
SUBJECT CODE: EC305	
Students will be able to	
CO1 :	To Verify Thevenin Theorem and Superposition Theorem.
CO2 :	To Verify Maximum Power Transfer Theorem
CO3 :	To Determine A,B, C, D parameters of a Two Port Network
CO4 :	To Find Frequency Response of RLC Series Circuit RLC parallel Circuit and determine resonance and 3dB frequencies..
CO5 :	To determine charging and discharging times of Capacitors.

NAME OF SUBJECT: EMI Lab	
SUBJECT CODE: EC306	
Students will be able to	
CO1 :	Measurement of Capacitor using Q-meter.
CO2 :	Design of digital to analog converter, R-2R ladder Type and analysis of its characteristics.
CO3 :	To calculate Frequency and amplitude using CRO & Function Generator.
CO4 :	Temperature measurement by thermocouple.
CO5 :	Study of optical Transducers: Photo conductive, Photo voltaic.

NAME OF SUBJECT: Energy & Environmental Engineering	
SUBJECT CODE: ES401	
Students will be able to	
CO1 :	Introduction to energy systems and resources; Introduction to Energy, sustainability & the environment.
CO2 :	Concept of an ecosystem; Structure and function of an ecosystem; Producers, consumers and decomposers.
CO3 :	From Unsustainable to Sustainable development; Urban problems related to energy; Water conservation, rain water harvesting, watershed management; Resettlement and rehabilitation of people; its problems and concerns.
CO4 :	Definition, Cause, effects and control measures of Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Thermal pollution.
CO5:	Biodiversity and its conservation

NAME OF SUBJECT: Signals & Systems	
SUBJECT CODE: EC402	
Students will be able to	
CO1 :	To implement delta function, unit step function, ramp function and parabolic function for continuous-time.
CO2 :	To implement rectangular function, triangular function, sinc function and signum function for continuous-time
CO3 :	To explore the communication of even and odd symmetries in a signal with algebraic operations.
CO4 :	To determine Magnitude and Phase response of Fourier Transform of given signals..
CO5 :	To demonstrate the convolution of two discrete-time signals.

NAME OF SUBJECT: Analog Communication	
SUBJECT CODE: EC403	
Students will be able to	
CO1 :	To analyze characteristics of AM modulator & Demodulators.
CO2 :	Describe frequency domain representation of signal
CO3 :	Describe AM transmitter& receiver.
CO4 :	To design and analyze characteristics of FM modulator and AM Demodulator using PLL.
CO5 :	To construct frequency multiplier circuit and to observe the waveform.

NAME OF SUBJECT: Control System	
SUBJECT CODE: EC404	
Students will be able to	
CO1 :	Control System performance analysis and applications of MATLAB in Control system performance analysis & design.
CO2 :	Describe classification of control system.
CO3 :	Concept of stability of linear systems, effects of location of poles on stability, necessary conditions for stability, Routh-Hurwitz stability criteria.
CO4 :	Approaches to system design Design problem, types of compensation techniques, design of phase-lag, phase lead and phase lead-lag compensators in time and frequency domain, proportional, derivative, integral and Composite Controllers.
CO5 :	Describe the state space representation of system.

NAME OF SUBJECT: Analog Circuits	
SUBJECT CODE: EC405	
Students will be able to	
CO1 :	To measure and compare the op-amp characteristics: offset voltages, bias currents, CMRR, Slew Rate of OPAMP LM741 and TL082.
CO2 :	To determine voltage gain and frequency response of inverting and non-inverting amplifiers using TL082.
CO3 :	To design Astable, Monostable and Bistable multivibrator using 555 and analyse its characteristics
CO4 :	To design a PLL using op-amp with MPY634 and determine the free running frequency, the capture range and the lock in range of PLL.
CO5 :	Design and test a Low Dropout regulator using op-amps for a given voltage regulation characteristic and compare the characteristics with TPS7250 IC.
CO6 :	Describe Voltage Regulator.
CO7 :	Describe characteristics of op-amp

NAME OF SUBJECT: Simulation Lab	
SUBJECT CODE: EC406	
Students will be able to	
CO1 :	Basic Electronic circuits (examples rectifiers, clippers, clampers, diode, transistor characteristics etc).
CO2 :	Use of virtual instruments built in the software.
CO3 :	Introduction to circuit simulation software (TINA-PRO/ PSPICE/ CIRCUIT MAKER).
CO4 :	Develop program using the java collection API as well as the java standard class library.
CO5 :	Study of the key features and applications of the software in the field of Electronic Circuits, Electronic Instrumentation and Network Analysis.

NAME OF SUBJECT: MICROPROCESSOR AND ITS APPLICATIONS	
SUBJECT CODE: EC501	
Students will be able to	
CO1 :	Salient features of advanced microprocessors.
CO2 :	Intel 8086 microprocessor programming
CO3 :	To study the general purposes programmable peripheral devices .
CO4 :	Introduction to microcontrollers (8051) and embedded systems.
CO5 :	Use of microcontrollers in embedded systems.

NAME OF SUBJECT: DIGITAL COMMUNICATION	
SUBJECT CODE: EC502	
Students will be able to	
CO1 :	To determine the sampling theorem for low pass and band pass signals.
CO2 :	Pulse code modulation, Quantization, quantization noise, companding, Inter symbol interference, Eye pattern, Delta and adaptive modulation.
CO3 :	To determine the band pass data transmission.
CO4 :	Comparison of different modulation techniques.
CO5 :	Error correcting codes: linear block codes and cyclic codes: encoder and decoder circuits, burst error correcting codes, concept of convolution codes.



NAME OF SUBJECT: Communication Network and Transmission Lines (CNTL)	
SUBJECT CODE: EC- 503 (A)	

Students will be able to	
CO1 :	Characteristic Parameters of symmetrical and asymmetrical two port networks.
CO2 :	Passive LC Filters Analysis and design of Low pass, high pass, band pass and band elimination filters.
CO3 :	Positive real function LC, RL, RC, and RLC network synthesis, Foster and Cauer network, minimum positive real function, Brune's method, Bott-Duffin method, Synthesis-Coefficient.
CO4 :	To study the transmission line fundamentals
CO5 :	Line at radio frequencies Parameters of line and coaxial cable at radio frequencies, dissipation- less line.

NAME OF SUBJECT: <b>Computer System Organization</b>	
SUBJECT CODE: EC- 504 (B)	
Students will be able to	
CO1 :	Describe the concepts of, CPU, Memory, I/O, System Bus, CPU and Memory registers, Program Counter.
CO2 :	List the Instruction register, Micro operations, Register Transfer Language.
CO3 :	Define Instruction Fetch, decode and execution, data movement and manipulation.
CO4 :	Develop Instruction formats and addressing modes of basic computer.
CO5 :	Use the Von Newman model, various subsystems.

NAME OF SUBJECT: CNTL Lab	
SUBJECT CODE: EC-505	
Students will be able to	
CO1 :	Implementing Positive real function LC, RL, RC, and RLC network synthesis, Foster and Cauer network, minimum positive real function, Brune's method, Bott-Duffin method, Synthesis- Coefficient.
CO2 :	Analyzing characteristic Parameters of symmetrical and asymmetrical two port networks
CO3 :	To implement transmission line fundamentals.
CO4 :	Passive LC Filters Analysis and design of Low pass, high pass, band pass and band elimination filters

**SUBJECT CODE EC- 603 (A)**

Students will be able to

CO1 :	Discuss data representation Serial & Parallel transmission , Modes of data transmission..
CO2 :	Study Line Encoding: Unipolar, Polar, Bipolar.
CO3 :	Networks – Protocols and standards – Standards organizations..
CO4 :	Develop Line configurations – Topology – Transmission mode – Categories of networks – Inter

**NAME OF SUBJECT: Digital signal Processing****SUBJECT CODE: EC601**

Students will be able to

CO1 :	Recognize the characteristics of Discrete-time signals, discrete-time systems,
CO2 :	Apply supervised learning methods to solution of difference equation, implementation of discrete-time systems,.
CO3 :	Identify stability and causality of s/s.
CO4 :	Create frequency domain representation of discrete time signals and systems.
CO5 :	Analyze analysis of discrete-time linear time-invariant systems.

**NAME OF SUBJECT: Antennas and wave Propagation****SUBJECT CODE: EC602**

Students will be able to

CO1 :	Have a good understanding of the OSI Reference Model and its Layer Potential function and the Electromagnetic field, potential functions for Sinusoidal Oscillation.
CO2 :	Implementing the Alternating current element (or oscillating Electric Dipole), Power radiated by a current element
CO3 :	Analyze Application to short antennas, Assumed current distribution, Radiation from a Quarter wave monopole or Half wave dipole.
CO4 :	Specify and identify sine and cosine integral, Electromagnetic field close to an antenna, Solution of the potential equations
CO5 :	To experience the designing and managing Far-field Approximation.

<b>NAME OF SUBJECT: Open Elective Microcontroller &amp; Embedded system</b>	
<b>SUBJECT CODE: EC- 604 (A)</b>	
Students will be able to	
CO1 :	Understand the core concepts of 8051 Interfacing, Applications and serial communication 8051 interfacing to ADC and DAC.
CO2 :	Implement various Stepper motor interfacing, Timer/ counter functions, 8051 based data acquisition system.
CO3 :	8051 connections to RS-232, 8051 Serial communication.
CO4 :	Understand Serial communication modes.
CO5 :	Performing serial port programming in C..

<b>NAME OF SUBJECT DATA COMMUNICATION LAB</b>	
<b>SUBJECT CODE: : EC- 605</b>	
Students will be able to	
CO1 :	TO STUDY VARIOUS MULTIPLEXING TECHNIQUES.
CO2 :	TO STUDY OF NETWORK INTERFACE CARD (NIC).
CO3 :	TO STUDY OF PARALLEL AND SERIAL TRANSMISSION.
CO4 :	TO STUDY OF NRZ AND RZ CODES.
CO5 :	TO STUDY OF DIGITAL INTERFACE RS-232.

<b>NAME OF SUBJECT MICROCONTROLLER &amp; EMBEDDED SYSTEM LAB</b>	
<b>SUBJECT CODE: : EC- 606:</b>	
Students will be able to	
CO1 :	Learn the Programming using arithmetic, logical and bit manipulation instructions of 8051.
CO2 :	Be familiar with Program and verify Timer/Counter in 8051.
CO3 :	Be exposed to communication between 8051 kit and PC.
CO4 :	Write an ALP to transmit the data using P1 of 8051.

NAME OF SUBJECT: <b>VLSI Design</b>	
SUBJECT CODE: <b>EC- 701</b>	
Students will be able to	
CO1 :	Describe To understand the fabrication process of CMOS technology.
CO2 :	Understand the fundamental of VLSI circuit design and implementation using circuit simulators and layout editors
CO3 :	To study various problems due to VLSI technology advancement..
CO4 :	To study digital circuits using various logic methods and their limitations.

NAME OF SUBJECT: <b>MICROWAVE ENGINEERING</b>	
SUBJECT CODE: <b>Departmental Elective EC- 702 (A)</b>	
Students will be able to	
CO1 :	Describe in-depth about theories, methods to Identify various types of Microwave electronic components and systems..
CO2 :	Understand different modes of operation of various RF and Microwave circuits..
CO3 :	Design and analyze of high frequency circuits and systems.
CO4 :	Solving complex RF & Microwave communication network design problems.

<b>NAME OF SUBJECT: Internet of Things (IoT)</b>	
<b>SUBJECT CODE: EC- 703 (B)</b>	
Students will be able to	
CO1 :	Describe in-depth about how to connect various devices through Internet and control them remotely.
CO2 :	provide methods for different types of networking and data storage.
CO3 :	The course aims at providing communication overview and protocols for safe and secure data access and transfer and maintain confidentiality and integrity.

<b>NAME OF SUBJECT: IOT LAB</b>	
<b>SUBJECT CODE: EC- 705:</b>	
Students will be able to	
CO1 :	Explain the basic concepts of wireless network and wireless generati LAB INDEX Design, Developed and implement following using Arduino, Raspberry Pi compiler and Python language in Linux/Windows environmentons.
CO2 :	LAB INDEX Design, Developed and implement following using Arduino, Raspberry Pi compiler and Python language in Linux/Windows environment
CO3 :	Write Program for RGB LED using Arduino.
CO4 :	WAP for LED blink using Raspberry Pi. ,Study and Implement Zigbee Protocol using Arduino / Raspberry Pi
CO5:	Study and implement MQTT protocol using Arduino. 10. Study and implement CoAP protocols.

NAME OF SUBJECT Optical Fibre Communication	
SUBJECT CODE: EC801	
Students will be able to	
CO1 :	Understand vector nature of light, propagation of light, propagation of light in a cylindrical dielectric rod, Ray model.
CO2 :	Demonstrate Signal degradation in Optical Fibre.
CO3 :	Optical sources and detectors.
CO4 :	Optical transceivers; Direct detection and coherent receivers, noise in detection process, digital receiver performance calculation.
CO5 :	Analyze Optical networks : Topologies, networks SONET and SDH.

NAME OF SUBJECT: 5G Technology	
SUBJECT CODE: EC 802 (C)	
Students will be able to	
CO1 :	Understanding 5G Broadband Wireless Communications.
CO2 :	Understanding 5G wireless Propagation Channels.
CO3 :	Knowledge about Transmission and Design Techniques for 5G.
CO4 :	Understanding of various : Device-to-device (D2D) and machine-to-machine (M2M) type communications
CO5 :	Millimeter-wave Communications.

NAME OF SUBJECT: Digital Image Processing	
SUBJECT CODE: EC 803 (B)	
Students will be able to	
CO1:	Digital Image Fundamentals.
CO2:	Two-dimensional (2D) impulse and its shifting properties.
CO3:	Spatial domain methods: basic intensity transformation functions, fundamentals of spatial filtering, smoothing spatial filters (linear and non-linear).
CO4:	To understand Frequency domain methods.

NAME OF SUBJECT: Advanced Communication  
Engg. Lab

SUBJECT CODE:  
EC 804

Students will be able to

CO1 :	Describe the fundamental principles and practices associated with 1. Amplitude Shift Keying Modulation and Demodulation 2. Frequency shift keying Modulation and Demodulation.
CO2 :	Measurement of frequency ,guided wavelength,power,VSWR and attenuation in a microwave test bench.
CO3 :	Determination of coupling and isolation characteristics of a stripline directional coupler.
CO4 :	. Power Division and Isolation characteristics of a microstrip 3dB power divider.

NAME OF SUBJECT: Major  
Project- II

SUBJECT CODE: EC805

Students will be able to

CO1 :	Show evidence of independent investigation
CO2 :	Critically analyze the results and their interpretation.
CO3 :	Report and present the original results in an orderly way and placing the open questions in the right perspective.
CO4 :	Link techniques and results from literature as well as actual research and future research lines with the research.
CO5 :	Appreciate practical implications and constraints of the specialist subject



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### **Branch: M. Tech (Digital Communication)**

### **Programme Educational Objectives (PEOs)**

1. Practice with an expertise in academics, entrepreneurship, design and development in computing technology, or research in a specialized area of Digital Communication to pursue higher studies.
2. Exhibit analytical, decision making and problem solving skills by applying research principles for handling real life problems with realistic constraints.
3. Ability to communicate the findings or express innovative ideas in an effective manner with an awareness of professional, social and ethical responsibilities.

### **Programme Outcomes (POs)**

- a. Acquire in-depth knowledge of communication systems and engineering , including wider and global perspective, with an ability to discriminate, evaluate, analyze and synthesize existing and new knowledge, and integration of the same for enhancement of knowledge.
- b. Ability to design and conduct experiments, as well as to analyze and interpret data.
- c. Analyse complex engineering problems of circuits & communication systems critically, apply independent judgement for synthesising information to make intellectual and/or creative advances for conducting research in a wider theoretical, practical and policy context. Ability to explore research gaps, analyze and carry out research in the specialized/emerging areas.
- d. Design software systems, components, or processes to meet identified needs within economic, environmental and social constraints.
- e. Ability to express/present ideas in an impressive and professional manner.
- f. Recognize the need to engage in lifelong learning through continuing education and research.
- g. Ability to work in multidisciplinary and multicultural environment.



<b>Course Outcomes (Cos)</b>	
NAME OF SUBJECT: Advanced Mathematics	
SUBJECT CODE: MEDC – 101	
Students will be able to	
CO1 :	Understand fundamental concepts of a special topic in computational mathematics and its role in modern mathematics and applied contexts.
CO2 :	Demonstrate accurate and efficient use of specific computational mathematics techniques.
CO3 :	Demonstrate capacity for mathematical reasoning through analyzing, proving and explaining concepts from computational mathematics.

NAME OF SUBJECT: MICRO CONTROLLER SYSTEM DESIGN	
SUBJECT CODE: MEDC – 102	
Students will be able to	
CO1 :	Understand the Review of 8-Bit and 16-bit microprocessor, support chips and interfacing techniques.
CO2 :	Understand applications of INTEL 8051/ 8751, MOTOROLA 68HC0/68HC11 architecture, instruction set and programming, Memory mapping
CO3 :	Understand the application of Software development Modular approach, integrated software development environment, Object oriented interfacing and programming, Recursion and debugging
CO4 :	Understand the applications of DSP Processor architecture and sample design using TI – DSP, Embedded controllers.

NAME OF SUBJECT: DSP APPLICATION	
SUBJECT CODE: MEDC – 103	
Students will be able to	
CO1 :	Understand the classification of Discrete time signals: sequences, representation. Discrete time systems.
CO2 :	Understanding & Implementation of Z Transform processors and Discrete time random process
CO3 :	Basic structure of FIR and IIR, Bilinear Transformation, Design of Discrete time IIR filter.

NAME OF SUBJECT: VLSI DESIGN	
SUBJECT CODE: MEDC – 104	
Students will be able to	
CO1 :	Basic concept of integrated circuits and manufacturing, Design fundamental for digital CMOS circuits
CO2 :	Define modeling techniques PLA and ROM Implementation.
CO3 :	Describe CMOS circuit and Logic Design.
CO4 :	Demonstrate Memory and Control Strategies.
CO5 :	Demonstrate CAD system and Algorithms.

NAME OF SUBJECT: DATA COMMUNICATION AND COMPUTER NETWORK	
SUBJECT CODE: MEDC – 105	
Students will be able to	
CO1 :	Understand the main abstract concepts related to synchronous and asynchronous transmission.
CO2 :	Analyze and implement some of the most advanced Data link control, point-to-point and multi-point links, flow control, sliding window protocol, various ARQ technique.
CO3 :	Communication Network:- Virtual circuit and datagram.
CO4 :	Understand basics and principles of Local Area network,WAN.

NAME OF SUBJECT: System Programming	
SUBJECT CODE: MEDC – 201	
Students will be able to	
CO1 :	Fundamental of programming, steps in problem solving with digital computer algorithm.
CO2 :	Discuss the insights of Data & Data types, data representation, data structure array-various operations with array, concept of pointers and pointers manipulations, pointers for data structures and functions.
CO3 :	Demonstrate the importance of static and dynamic allocations, implementations with arrays and pointers, various operations like searching, appending, insertion & deletion in lists, doubly linked list and their implementations, stack,PUSH/POP &.
CO4 :	Utilize the concepts of Searching and sorting, linear, binary and Hash search, minimum and maximum selection, divide and conquer, sorting, insertion sort, bubble sort.
CO5 :	Overview of system programs, Assembler, interpreter, compiler, Editor and operating system.

NAME OF SUBJECT: Modelling and Simulation of Computer	
SUBJECT CODE: MEDC – 202	
Students will be able to	
CO1 :	Understand Discrete event system simulation, its applications, advantages and disadvantages, system and system, environments and component of system.
CO2 :	Learn terminology and concepts, useful statistical models.
CO3 :	Understand, analyze and implement different Queuing mode.
CO4 :	Understand the classification of Random number and its generation.
CO5 :	Identify the Introduction and validation of simulation models.

NAME OF SUBJECT: Network Design Technology	
SUBJECT CODE: MEDC – 203	
Students will be able to	
CO1 :	Review of concepts of Layering and Layered models- OSI & TCP/IP
CO2 :	Understand the basic concepts and techniques of LAN system, Ethernet system, Fast Ethernet& Gigabit Ethernet.
CO3 :	Perform multidimensional analysis Introduction to IP routing, various interior gateways protocols like RIP.
CO4 :	Introduction to label Switching and MPLS WAN technology.
CO5 :	Ability to do Conceptual, Logical, and Physical design of ATM: ATM adaptation layer (AAL)

NAME OF SUBJECT: Optical Network	
SUBJECT CODE: MEDC – 204	
Students will be able to	
CO1 :	To understand the basics of optical network: Telecommunication.
CO2 :	Network components: couplers, Isolators, Circulators, Multiplexer , filter, fiber bragg gratings as ADD/Drop multiplexers, frabry perot filters, acoustics optical tunable filters
CO3 :	Implement First generation of optical network: SONET , SDH, goals of SONET design.
CO4 :	To understand how Broad cast and select network
CO5 :	To know various Wavelength routing network, Photonic packet switching.

NAME OF SUBJECT: Mobile & Satellite Communication	
SUBJECT CODE: MEDC – 205	
Students will be able to	
CO1 :	Understand concept of wireless and cellular radio communication.
CO2 :	Speech coding for wireless system applications and broadcast systems
CO3 :	<u>Understand</u> Modulation techniques for mobile and satellite communication.
CO4 :	To understand MAC Protocols.
CO5 :	Demonstrate GEO, MEO and LEO satellite systems.

NAME OF SUBJECT: Information Theory & Coding	
SUBJECT CODE: MEDC – 301(A)	
Students will be able to	
CO1 :	Demonstrate an understanding of uncertainty, information, entropy and its properties.
CO2 :	Discrete memory less channels, Binary symmetric channel, mutual
:	informationtechniques
CO3 :	Implement the appropriate Group and field of Binary system Galois field and its construction.
CO4 :	Define syndrome computation & error detection.
CO5 :	Demonstrate an understanding of BCH codes, its encoding & decoding

NAME OF SUBJECT: Advanced Digital Communication	
SUBJECT CODE: MEDC – 302(A)	
Students will be able to	
CO1 :	Describe o digital modulation technique and their spectral characteristics.
CO2 :	Estimation of signal parameters, carrier phase and symbol timings.
CO3 :	Data integrity, Authentication, Digital Signatures.
CO4 :	Optimum receivers for channels with ISI and AWGN.
CO5 :	Be able to Characterization of fading multi path channels.

NAME OF SUBJECT: Optical Instrumentation & Measurement	
SUBJECT CODE MEDC – 302(B)	
Students will be able to	
CO1 :	Define, describe various Optical Instruments.
CO2 :	Classify various Fiber Optics Component and Devices.
CO3 :	Demonstrate Fiber optic sensors.
CO4 :	Fiber optic Measurement: Introduction to measurement techniques.
CO5 :	Construct a model for Refractive Index Profile, Geometric Measurement.

NAME OF SUBJECT: Dissertation Part- I	
SUBJECT CODE: MEDC304	
Students will be able to	
CO1 :	Solve real life problems by applying knowledge.
CO2 :	Analyze alternative approaches, apply and use most appropriate one for feasible solution
CO3 :	Write precise reports and technical documents in a nutshell.
CO4 :	Participate effectively in multi-disciplinary and heterogeneous teams exhibiting team work, Inter-personal relationships, conflict management and leadership quality.

NAME OF SUBJECT: Dissertation Part- II	
SUBJECT CODE: MEDC 401	
Students will be able to	
CO1 :	Show evidence of independent investigation
CO2 :	Critically analyze the results and their interpretation.
CO3 :	Report and present the original results in an orderly way and placing the open questions in the right perspective.
CO4 :	Link techniques and results from literature as well as actual research and future research lines with the research.
CO5 :	Appreciate practical implications and constraints of the specialist subject.