DEPARTMENT OF ELECTRONICS AND TELECOMMUNICATION

SE : III SEM (CBCS)

Subject: Applied Mathematics III (ECC301)

CO1: Obtain and invert Laplace transform using standard results and shifting theorems.

CO2: Obtain solution Ordinary Differential Equations using Laplace Transform.

CO3: Expand the periodic function using Fourier series and Convert the time parameter to space/frequency parameter using Fourier transforms.

CO4: Transform the curves of z - plane to curves in w - plane using the concept of Bilinear transformation.

CO5: Explain Recurrence relation between the sequences of Bessel's function.

CO6: Perform calculation with operators Gradient, Del and Curl. Solve the examples of laws with both differential and integral form by the theorems like Gauss divergence, Stoke's theorem.

Subject: Electronics Circuits & Devices-I (ECC302)

CO1: Explain Current Voltage Characteristics of Semiconductor devices.

CO2: Design Rectifier, Filter, Zener diode as voltage regulator.

CO3: Analyze dc biasing circuits of BJT, FET.

CO4: Analyze BJT, FET amplifiers using different types of AC model.

CO5: Evaluate the Time and Frequency response of BJT and FET amplifier.

CO6: Design and analyze amplifier circuit for given specification.

Subject: Digital System Design (ECC303)

CO1: Apply Digital logic to solve real life Problem.

CO2: Analyze, design and implement combinational logic circuits.

CO3: Classify different semiconductor memories.

CO4: Analyze, design and implement sequential logic circuits.

CO5: Analyze digital system design using PROM, PLA,PAL.

CO6: Implement combinational and sequential circuits using vhdl.

Subject: Circuit Theory and Network (ECC304)

CO1: Apply network theorems to analyze circuits with dependent sources.

CO2: Analyze the DC circuits in time & frequency domain.

CO3: Analyze ladder & non Ladder circuits using network functions.

CO4: Analyze two port networks using various parameters.

CO5: Synthesize the network using passive elements.

CO6: Analyze Electrical Networks using Graph theory.

Subject: Electronic Instrumentation and Control (ECC305)

CO1: Describe the method and characteristics of measuring instruments.

CO2: Explain principle of operation of various sensors & transducers.

CO3: Describe telemetering & data acquisition system.

CO4: Implement different techniques for finding transfer function of a given system.

CO5: Analyze the stability of a given system in time domain.

CO6: Analyze the stability of a given system in frequency domain.

SE : IV SEM (CBCS)

Subject: Applied Mathematics IV (ECC401)

CO1: Find Eigen values and eigenvectors of a matrix to diagonalize the Square matrix.

CO2: Analyze the quadratic form of a matrix.

CO3: Evaluate integral using Cauchys theorem, residue theorem.

CO4:Use Gram Schmidt processes to orthagonalise the vectors.

CO5: Apply method of calculus of variations to find extremal of the functional.

CO6: Maximize or minimize functional by Euler–Lagrange equation.

Subject: Electronic Devices & Circuits-II (ECC402)

CO1:Design and analyze DC biasing circuits.

CO2: Analyze various configurations of BJT and FET multistage amplifier.

CO3: Design BJT and FET multistage amplifiers.

CO4: Analyze and design various power amplifier circuits.

CO5: Compare and analyze different types of feedback amplifiers.

CO6: Analyze and design different types of oscillators.

Subject: Linear Integrated Circuits (ECC403)

CO1: Explain basic configurations of operational amplifier with and without feedback.

CO2: Design and analyze linear applications of op-amp namely amplifiers, converters, filters & oscillators.

CO3: Explain and analyze non linear applications of op-amp.

CO4: Analyze ADC & DAC circuits using op-amp.

CO5: Explain working principle of the special purpose integrated circuits and its applications.

CO6: Describe and design different types of voltage regulators.

Subject: Signals and Systems (ECC404)

CO1: Classify and analyze various types of signals and systems.

CO2: Analyze continuous time and discrete time systems in time domain.

CO3: Analyze continuous time and discrete time signals in frequency domain.

CO4: Analyze discrete time LTI systems using Z-transform.

CO5: Apply and analyze state space equations and to realize discrete time structures.

CO6: Explain the applications of signals and systems.

Subject: Principles of Communication Engineering (ECC405)

CO1: Explain the basics of communication system and noise.

CO2: Describe amplitude modulation and demodulation and its applications.

CO3: Compare AM, FM and PM and applications of angle modulation.

CO4: Compare different types of radio receivers.

CO5: Prove sampling theorem and compare PAM, PWM and PPM.

CO6: Explain TDM, FDM and its applications.

TE : V SEM (CBCS)

Subject: Microprocessor Peripheral Interfacing (ECC501)

CO1: Explain the basic concepts of microcomputer system.

CO2: Explain the architecture, pin configuration & organization of 8086 microprocessor.

CO3: Apply the knowledge of instruction sets to write assembly language programs for 8086.

CO4: Explain the interfacing of various peripheral devices with 8086.

CO5: Explain Interfacing of ADC, DAC & 8087 with 8086.

CO6: Design 8086 based system for given specifications.

Subject: Digital Communication (ECC 502)

CO1: Explain probability theory, random variables and random processes

CO2: Apply the concepts of information theory in source coding

CO3: Evaluate the performances of different error control codes and applications

CO4: Compare the performances of different band pass modulations and applications

CO5: Evaluate various methods to eliminate inter symbol interference

CO6: Compare different receiver techniques in terms of error probability.

Subject: Electromagnetic Engineering (ECC 503)

CO1: Derive the expressions of electric field intensity due to different charge configurations, using basic laws of electrostatics.

CO2: Derive the boundary conditions between two mediums and to calculate capacitance and potential.

CO3: Derive the expressions of magnetic field intensity, due to different current filaments, using basic laws of magneto statics and classify magnetic materials.

CO4: Derive and explain the significance of Maxwell's equation and also understand the best suitable medium for propagation of wave.

CO5: Compare wave theory with transmission line theory.

CO6**:** Explain applications of electromagnetics.

Subject: Discrete Time Signal Processing (ECC 504)

CO1: Apply Discrete Fourier Transform (DFT), Fast Fourier Transform (FFT) and its properties for frequency domain analysis.

CO2: Compare analog and digital filters and can design IIR type digital filters.

CO3: Analyze and design FIR type digital filters.

CO4: Analyze the effect of hardware limitations on performance of digital filters.

CO5: Explain architecture of dsp processors.

CO6: Apply the knowledge of dsp processors for various applications.

Subject: TV and Video Engineering (ECCDLO 5012)

CO1: Explain fundamentals of tv system.

CO2: Compare monochrome and colour tv.

CO3: Explain various compression techniques used for Digital Video transmission.

CO4: Differentiate various digital video broadcasting techniques.

CO5: Explain Advanced Digital TV systems.

CO6: Compare types of TV displays & explain streaming media device

Subject: Data Compression & Encryption (ECCDLO 5014)

CO1: Apply various types of text compression techniques

CO2: Compare various techniques used in image compression.

CO3: Explain various methods of audio compression

CO4: Compare and summarize different ciphers

CO5: Analyze and apply methods of cryptography.

CO6: Apply basic security concepts on real time problems.

TE: VI SEM (CBCS)

Subject: Microcontrollers and Applications (ECC601)

CO1: Explain the internal architecture of 8051 microcontroller.

CO2: Write assembly language programs using instruction set of 8051 microcontroller.

CO3: Apply the knowledge of interfacing peripheral devices to the microcontroller to design microcontroller based system.

CO4: Explain the internal architecture of ARM7.

CO5: Describe instruction sets for ARM7.

CO6: Write embedded C language program for ARM7.

Subject: Computer Communication Network (ECC602)

CO1.Compare and demonstrate various network applications, hardware, software, models, physical media and multiplexing schemes.

CO2: Compare error control, flow control, congestion control, framing and medium access control methods.

CO3.Demonstrate/illustrate the use of network layer protocol, addressing and subnetting.CO3

CO4.Compare routing algorithms and protocols.

CO5.Compare connectionless and connection oriented services and protocols.

CO6.Demonstrate/illustrate the use of tcp three-way handshaking, connection management, transmission policy and timer management.

Subject: Antenna and Radio wave Propagation (ECC603)

CO1: Explain the fundamentals of antenna theory and summarize antenna parameters and radiation mechanism.

CO2: Derive the field equations for the basic radiating elements and to construct its radiation patterns

CO3:Evaluate and use appropriate antenna array design for given specifications

CO4: Differentiate the fundamentals of aperture and reflector antenna design and its applications.

CO5: Design patch antennas and compare its performance with other antennas.

CO6: Explain the procedure of various antenna parameter measurements and the techniques of wave propagation.

Subject: Image Processing and Machin Vision (ECC 604)

CO1: Explain theory and models in image processing.

CO2: Interpret and analyze 2d signals through transforms

CO3: Apply quantitative models of image restoration for various applications

CO4: Apply models of segmentation to various applications and identify regions in the image

CO5: Identify the shape using various representation techniques and classify the object using different classification methods

CO6: Apply image enhancement techniques in spatial and frequency domain to various images

Subject: Radar Engineering (ECCDLO602)

CO1: Explain generalized concept of radar.

CO2: Determine various parameters of various radar using radar equation.

CO3 : Compare different types of radar for specific application.

CO4: Explain the concept of tracking radar and it's applications.

CO5: Evaluate the design constraints for transmitter.

CO6: Compare different radar displays.

BE : VII SEM (CBCS)

Subject: Microwave Engineering (ECC 701)

CO1: Characterize devices at higher frequencies.

CO2: Analyze waveguide and passive devices.

CO3: Analyze the microwave components and design the tuning and matching networks by using smith chart.

CO4: Design and analyze microwave circuits.

CO5: Analyze amplifiers and oscillators at microwave frequencies.

CO6: Demonstrate skills of planning, design and deployment of microwave networks.

Subject: Mobile Communication Systems (ECC702)

CO1: Design cellular systems and their estimate the coverage and capacity.

CO2: Analyze the link budget and classify different types of propagation models.

CO3: Compare and Analyze mobile communication generations 2G, 2.5G, 3G w.r.t their architectures, frame structures, system capacity, services provided, characteristics and limitations.

CO4: Apply the concepts of 3G technologies of UMTS and CDMA 2000.

CO5: Elaborate the principles of 3GPP LTE.

CO6: Apply the mobile communication concepts to study the emerging technologies required for 4th generation mobile systems such as cognitive radio and MIMO.

Subject: Optical Communication (ECC 703)

CO1: Apply the fundamental principles of optics and light wave to design optical fiber communication systems.

CO2: Differentiate losses in optical fiber link and explain transmission characteristics of optical fiber.

CO3: Describe working principles and characteristics of various sources to develop the optical fiber systems.

CO4: Explain working principles and characteristics of various detectors to develop the optical fiber systems.

CO5: Explain working principles and characteristics of various fiber optic components.

CO6: Calculate parameters for optical link budgeting to design & analyze the optical fiber link.

Subject: Embedded Systems (ECCDLO7035)

CO1: Explain embedded system characteristics, quality attributes, product development life cycle and Create a model for an embedded system using program modeling.

CO2: Compare processor architectures.

CO3: Explain embedded system communication protocols.

CO4: Explain the concepts of operating system, task, process and thread

CO5: Solve scheduling problems in RTOS.

CO6: Design embedded system applications using RTOS.

Subject: Neural Network & Fuzzy Logic (ECCDLO7031)

CO1: Describe the concepts of biological neurons and artificial neurons.

CO2: Analyze the feed-forward and feedback neural networks and their learning algorithms.

CO3: Calculate the neural network training and design concepts.

CO4: Analyze the application of neural networks to non linear real world problem.

CO5: Explain the concept of fuzziness involved in various systems, fuzzy set theory and fuzzy logic.

CO6: Design fuzzy logic to real world problems.

Subject: Product Lifecycle Management (ILO 7011)

CO1: Gain knowledge about phases of PLM, PLM strategies and methodology for PLM feasibility study and PDM implementation.

CO2: Illustrate various approaches and techniques for designing and developing products.

CO3: Apply product engineering guidelines / thumb rules in designing products for moulding, machining, sheet metal working etc.

CO4: Acquire knowledge in applying virtual product development tools for components, machining and manufacturing plant.

CO5: Illustrate various environment aspects on product design.

CO6: Demonstrate the relevance between life cycle assessment and life cycle cost analysis.

Subject: Operation Research (ILO7015)

CO1: Apply the techniques used in operations research to formulate a real-world problem and solve it using various problem solving approaches.

CO2: Develop an integrated framework for strategic thinking and problem solving.

CO3: Identify the situations and appropriate equations and mathematical tools needed to solve optimization problems.

CO4: Identify the characteristics of different situations and apply the appropriate decision making tools to be used in each type.

CO5: Gain the ability to recognize situations in a manufacturing environment that suggests the use of certain quantitative methods to assist in optimizing the solution.

CO6: Plan of national importance structures based upon the previous history.

Subject: Cyber Security and Laws (ILO7016)

CO1: Understand the concept of cybercrime and its effect on outside world.

CO2: Understand different cyber offences and cyber-crime on different environment.

CO3: Analyze various tools used in performing cybercrime.

CO4: Understand the legal requirement of cyberspace.

CO5: Distinguish different aspects of cyber law.

CO6: Identify the need for different Information Security Standards compliance during software design and development.

Subject: Disaster Management and Mitigation Measures (ILO7017)

CO1: Able to understand the natural & man-made disaster and its relationships with human activities

CO2: To apply the fundamental knowledge of science and engineering to asses disaster and risk management.

CO3: To develop guidelines and procedures for disaster and safety issues obeying the disaster management laws and regulations.

CO4: Acquire skills for scientific problem-solving related mitigation of disaster.

CO5: Explain simple do‘s and don‘ts in such extreme events and act accordingly.

CO6: Plan of national importance structures based upon the previous history.

Subject: Project-I (ETP701)

CO1: Analyze the quality of problem selected by applying engineering knowledge.

CO2: Identify the relevance to the specialization/Industrial trends/Societal and environmental needs.

CO3: Plan, design and estimate the cost, feasibility and scope/Techniques/ tools to be used.

CO4: Perform extensive literature survey and provide partial solution to the problem by following ethics.

CO5: Cultivate the habit of working in team along with financial management.

CO6: Prepare, organize and present the documents (Synopsis) and acquired knowledge.

BE : VIII SEM (CBCS)

Subject: RF Design (ECC 801)

CO1: Design Impedance Matching network for different RF Circuits.

CO2: Design passive RF filters.

CO3: Design and appraise RF amplifiers.

CO4: Design and appraise RF oscillators.

CO5: Analyze EMI in RF Circuits.

CO6: Analyze EMC in RF circuits.

Subject: Wireless Networks (ECC802)

CO1: Compare various standards and architectures of wireless network.

CO2: Compare body area network and personal area network.

CO3: Classify different LAN topologies and technologies.

CO4: Design the wireless network by illustrating the fundamentals and architecture of metropolitan area networks.

CO5: Compare various wireless adhoc network based on architecture, traffic related protocols and transmission technology.

CO6: Explain the basic architecture and working of IoT.

Subject: Optical Networks (ECCDLO8041)

CO1: Identify the issues related to signal degradation and need of optical components and networks.

CO2: Compare different first generation and second-generation optical network architectures.

CO3: Explore concepts of packet switching and access networks.

CO4: Compare and analyze various wavelength routing networks.

CO5: Design and analyze the performance of first generation and second-generation optical networks.

CO6: Apply the knowledge developed to control networks, their protection and fault management.

Subject: Satellite Communication (ECC DLO8043)

CO1: Describe basics of satellite communication system.

CO2:Explain the satellite internal sub systems for communication applications

CO3:Analyze link budget of satellite signal for proper communication

CO4:Classify earth station technology with design considerations

CO5:Compare different multiple access systems and its utilization

CO6: Compare competitive satellite services and explain architecture and characteristics for satellite networks.

Subject: Product Management(ILO8021)

CO1: Gain project management foundation and various organizational structures knowledge.

CO2: Apply selection criteria and select an appropriate project from different options.

CO3: Write work break down structure for a project and develop a schedule based on it.

CO4: Identify opportunities and threats to the project and decide an approach to deal with them strategically.

CO5: Use Earned value technique and determine & predict status of the project.

CO6: Capture lessons learned during project phases and document them for future reference.

Subject: Finance Management (ILO8022)

CO1: Explain the importance and components of the Indian Financial System.

CO2: Estimate the risk & returns and present / future value of various investments.

CO3: Describe corporate finance and significance of financial statements & ratio analysis.

CO4: Calculate capital budgeting using various investment appraisal criteria & also the working capital requirements.

CO5: Explain the various sources of finance and capital structure theories & approaches.

CO6: Describe the dividend policy theories & approaches.

Subject: Digital Business Management (ILO8028)

CO1: Summarize drivers of digital business.

CO2: Illustrate various approaches and techniques for E-business and management.

CO3: Explain different digital business support services and technologies in E infrastructure.

CO4: Explain various ethics and societal impacts of ecommerce.

CO5: Identify the need of security and summarize various security techniques.

CO6: Develop E-business plan.

Subject: Environmental Management (ILO8029)

CO1: Identify environmental Issues relevant to India and Global concerns.

CO2: Understand and apply the concept of Environment Management and Sustainable development.

CO3: Relate to the scope of Environment Management and identify career opportunities.

CO4: Understand the concept of ecology, Ecosystem, its interdependence and food chain.

CO5: Demonstrate awareness of environment related legislations.

CO6: Develop awareness of EMS and ISO-14000.

Subject: Project-II (ETP801)

CO1: Simulate and implement their proposed design of the problem.

CO2: Test and troubleshoot their model/prototype.

CO3: Compare the proposed work with the one reported in the literature.

CO4: Present their work through paper publication/presentation/project-exhibition/competition etc.

CO5: Cultivate the habit of working in a team along with financial management.

CO6: Prepare, organize the documents (thesis/black-book) by following ethics.