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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Course Name:	Complex Variables & Transform Techniques	**Course Index:**	**C211**
REGULATION:	**NRIA18**	**YEAR-SEM:**	**II-I**

The student will be able to:

CO INDEX	COURSE OUTCOME
C211.1	**Write** an analytic function if either real part or imaginary part is known and by **using** Cauchy-Riemann equations or **apply** Milne-Thompson method**(L3)**
C211..2	**Evaluate** the integral of complex function over the region bounded by the closed curves by **apply** either Cauchy-Goursat theorem or Cauchy's integral formula or Cauchy's Residue theorem**(L5)**
C211.3	**write** the infinite series expansion of complex function by **apply** Taylor's/Maclaurin's/Laurent's series**(L3)**
C211.4	**Write** a Fourier series expansion of a periodic function by **using** Euler's formulae **(L3)**
C211.5	**Understand** the concept of Fourier transform and its properties **(L2)**
C211.6	**Solve** the difference equations using Z-transforms and Inverse Z-transforms**(L3)**

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Course Name:	Network Analysis And Transmission Lines	**Course Index:**	**C212**
REGULATION:	**NRIA18**	**YEAR-SEM:**	**II-I**

The student will be able to:

CO INDEX	COURSE OUTCOME
C212.1	Gain the knowledge on basic RLC circuits behavior.
C212.2	Analyze the steady state and transient states of RLC circuits.
C212.3	Analyze the two port network parameters.
C212.4	Demonstrate the reflection and Refraction of EM waves at boundaries
C212.5	Analyse basic transmission line parameters.
C212.6	Analysis and Design of a transmission lines.

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Course Name:	Digital Electronics and Logic Design	**Course Index:**	**C213**
REGULATION:	**NRIA18**	**YEAR-SEM:**	**II-I**

The student will be able to:

CO INDEX	COURSE OUTCOME
C213.1	Understand the numeric information in different forms and interpret different logic gates.
C213.2	Minimize the given Switching functions in SoP and PoS forms using K-Map and Tabular Method.
C213.3	Analyze and Design various combinational circuits like Encoders, Decoders, Multiplexers, De-multiplexers, and Arithmetic Circuits.
C213.4	Design combinational logic circuits using different types of Programmable Logic Designs.
C213.5	Design and Implement various sequential circuits like flip flops, registers.
C213.6	Design the state diagrams with the knowledge of Mealy and Moore conversions, state machines using various flip flops.

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Course Name:	Signals and Systems	**Course Index:**	**C214**
REGULATION:	**NRIA18**	**YEAR-SEM:**	**II-I**

The student will be able to:

CO INDEX	**COURSE OUTCOME**
C214.1	Learn the basic concepts of signals and systems and represent signal in terms of Exponential and Trigonometric Fourier Series.
C214.2	Transform the time domain signal into frequency domain by applying Fourier Transform.
C214.3	Perform sampling and reconstruction of signals with the help of Nyquist criterion.
C214.4	Analyze Linear systems in time and frequency domain and understand the properties of convolution and correlation.
C214.5	Transform continuous time signals into complex frequency domain by applying Laplace Transforms.
C214.6	Transform discrete time signals into complex frequency domain by applying Z – Transforms.

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Course Name:	Data Structures and Algorithms	**Course Index:**	**C215**
REGULATION:	**NRIA18**	**YEAR-SEM:**	**II-I**

The student will be able to:

CO INDEX	**COURSE OUTCOME**
C215.1	Analyze algorithms, and to understand the concept of recursive function
C215.2	Summarize searching and sorting techniques.
C215.3	Describe linked list operations
C215.4	Describe stack, queue and linked list operation
C215.5	Understand the concept of Trees, able to use trees to solve real time problems
C215.6	Apply concepts of graphs to solve real time problems

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Course Name:	MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS	**Course Index:**	**C216**
REGULATION:	**NRIA18**	**YEAR-SEM:**	**II-I**

The student will be able to:

CO INDEX	COURSE OUTCOME
C216.1	Use the theory of Managerial Economics, Demand, Production analysis and fore casting theories.
C216.2	Analyze of production markets and pricing strategies .Functions and Cost-price functions to manage markets & Break-Even point.
C216.3	Develop an ability to identify, formulate and solve Engineering problem by applying the knowledge of Managerial Economics.
C216.4	Theorize about characteristics features and types of Industrial organization, concept of changing business environment in Post-Liberalization scenario.
C216.5	Enhance their capabilities in the interpretation of b/s that are followed in industries, organizations and institutes.
C216.6	Apply financial analysis ,capital budgeting techniques in Evaluating various investment opportunities

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Course Name:	COMPUTER ARCHITECTURE & ORGANIZATION	**Course Index:**	**C311**
REGULATION:	**R16**	**YEAR-SEM:**	**III-I**

The student will be able to:

CO INDEX	COURSE OUTCOME
C311.1	Understand the basics, evolution and architecture of the computer.
C311.2	Analyze the machine instructions and how to write programs
C311.3	Understand different types of instructions and can calculate the effective address of an operand by addressing modes.
C311.4	Analyze the concept of I/O organization and design how to interface i/o devices.
C311.5	Demonstrate the memory organization and understand the concept of cache mapping techniques
C311.6	Understand concepts of control unit and how to perform arithmetic operations and execute complete instructions

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Course Name:	LINEAR INTEGRATED CIRCUITS APPLICATIONS	**Course Index:**	**C312**
REGULATION:	**R16**	**YEAR-SEM:**	**III-I**

The student will be able to:

CO INDEX	**COURSE OUTCOME**
C312.1	Analyze & Design different type of differential amplifiers for various applications.
C312.2	Understand thoroughly the operational amplifier characteristics with linear integrated circuits.
C312.3	Design and Construct different circuits for various applications using Operational amplifiers.
C312.4	Analyze and design various active filters using frequency response characteristics.
C312.5	Understand and demonstrate the applications of 555, 565 and 566 IC's
C312.6	Design, Construct and Test the Analog to Digital and Digital to Analog converters.

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Course Name:	DIGITAL IC APPLICATIONS	**Course Index:**	**C313**
REGULATION:	**R16**	**YEAR-SEM:**	**III-I**

The student will be able to:

CO INDEX	COURSE OUTCOME
C313.1	Understand the structure of commercially available digital integrated circuit families, logical families, logic levels and electrical behavioural.
C313.2	Model complex digital systems at several levels of abstractions, elements, structure using statements in dataflow, behavioural, structural models in VHDL.
C313.3	Understanding development tools compilers, simulators and synthesis tools used to verify digital systems in a technology independent fashion.
C313.4	Analyse and Design basic digital circuit blocks with combinational circuits like decoders, encoders, multiplexers, and de-multiplexers including arithmetic circuits through VHDL models.
C313.5	Analyse and Design the concepts of sequential digital circuits like latches, flip-flops, MSI registers, counters, modes of operation of shift and universal shift register.
C313.6	Analyse and Design Synchronous and Asynchronous Sequential Circuits like Mealy & Moore type FSM, state reduction, state table, state assignment through VHDL models.

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Course Name:	DIGITAL COMMUNICATIONS	**Course Index:**	**C314**
REGULATION:	**R16**	**YEAR-SEM:**	**III-I**

The student will be able to:

CO INDEX	**COURSE OUTCOME**
C314.1	Determine the performance of different waveform coding techniques for the generation and digital representation of the signals.
C314.2	Determine the probability of error for various digital modulation schemes
C314.3	Analyze the concept of Base band receiver and Filter techniques
C314.4	Understand the concept of entropy and different source coding techniques
C314.5	Analyze different source coding techniques Compute and analyze different error control coding schemes for the reliable transmission of digital information over the channel.
C314.6	Compute and analyze different error control coding schemes for the reliable transmission of digital information over the channel.

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Course Name:	ANTENNAS AND WAVE PROPAGATION	**Course Index:**	**C315**
REGULATION:	**R16**	**YEAR-SEM:**	**III-I**

The student will be able to:

CO INDEX	**COURSE OUTCOME**
C315.1	Understand the basic antenna radiation parameters and radiation mechanism of wire antennas using mathematical equations.
C315.2	Quantify the radiation fields and power radiated by various types of wire antennas, Loop antennas also analyze their radiation characteristics using mathematical approach.
C315.3	Illustrate the different types of arrays and their radiation patterns with both mathematical and geometrical analysis.
C315.4	Understand the geometry and working principle of operation of non resonant radiators, broad band antennas and microstrip antennas with qualitative analysis.
C315.5	Design various reflector antennas, lens antennas, horn antennas also Analyze antenna measurements to assess antenna's performance
C315.6	Identify and distinguish the characteristics of different modes of radio wave propagation in the atmosphere with both qualitative and quantitative treatment.

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Course Name:	EMBEDDED SYSTEMS	**Course Index:**	**C411**
REGULATION:	**R16**	**YEAR-SEM:**	**IV-I**

The student will be able to:

CO INDEX	**COURSE OUTCOME**
C411.1	Understand the basic concepts of embedded system
C411.2	Design an approach of an embedded hardware
C411.3	Design various approaches for embedded firmware
C411.4	Design RTOS and discuss fundamental issues in hardware software co design
C411.5	Understand how to integrate hardware and firmware of embedded system
C411.6	Understand the various tools used in implementing the embedded systems

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Course Name:	COMPUTER NETWORKS	**Course Index:**	**C412**
REGULATION:	**R16**	**YEAR-SEM:**	**IV-I**

The student will be able to:

CO INDEX	**COURSE OUTCOME**
C412.1	Analyze the knowledge on different network models like OSI and TCP/IP and also about network topologies like WAN, LAN and MAN.
C412.2	Understand the different modes of transmission media such as copper wire, twisted pair wire, wireless and also learn digital modulation techniques.
C412.3	Analyze the design ISSUES OF data link layer by detecting and correcting errors in frames and analyze elementary data link protocol.
C412.4	Understand the medium access sub layer and error free transmission is possible for IEEE 802.X Standard Ethernet, wireless LANS and Bridges etc.
C412.5	Design and understand the routing algorithms so that they can build network efficiently with more data sending in less bandwidth and in less time Students will be able
C412.6	Interpret how important the security is for transmitted data without any misleading by unauthorized person in between from source to destination.

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Course Name:	DIGITAL IMAGE PROCESSING	**Course Index:**	**C413**
REGULATION:	**R16**	**YEAR-SEM:**	**IV-I**

The student will be able to:

CO INDEX	**COURSE OUTCOME**
C413.1	Demonstrate the ability to explain the basic elements and applications of image processing and to Perform different transforms on image
C413.2	Analyze image sampling and quantization requirements and implications and Perform gray level transformations, histogram equalization and implement order statistics for image enhancement, Design and implement two dimensional spatial domain and frequency domain filters for image enhancement
C413.3	Model the image restoration problems in both spatial and frequency domains, Explain Weiner filtering for de-blurring and noise removal
C413.4	Demonstrate the ability to explain Image Pyramids and subband coding, Process the image using wavelets and multireolution, Apply various compression techniques on an image
C413.5	Perform segmentation techniques on an image and apply various morphological operators on an image
C413.6	Analyze pseudo and full colour image processing techniques

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Course Name:	RADAR SYSTEMS	**Course Index:**	**C414**
REGULATION:	**R16**	**YEAR-SEM:**	**IV-I**

The student will be able to:

CO INDEX	**COURSE OUTCOME**
C414.1	Acquire the knowledge to apply and to design required parameters for a RADAR system and derive the RADAR Equation and to calculate Transmitter power.
C414.2	Analyze the working principle of CW and Frequency Modulated Radar and apply the Doppler Effect to the MTI and Pulse Doppler Radar.
C414.3	Design and analyze types of MTI Radars and Pulse Doppler Radar.
C414.4	Design and analyze different types of Tracking Radars with respective parameters.
C414.5	Design and analyze Antennas for Radar Transmitters and Receivers. Derive Matched filter expression and Design phased array antennas.
C414.6	Apply the techniques learned, to choose suitable Microwave devices from the available, for the required application.

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Course Name:	OPTICAL COMMUNICATIONS	**Course Index:**	**C415**
REGULATION:	**R16**	**YEAR-SEM:**	**IV-I**

The student will be able to:

CO INDEX	**COURSE OUTCOME**
C415.1	Understand the overview of optical fiber communication and classify the types of optical fibers, analyze cylindrical fibers using mathematical equations
C415.2	Design the optical fibers using various materials and to illustrate various attenuation losses and dispersion models
C415.3	Apply splicing techniques on fibers and choose low loss connectors to minimize joint losses
C415.4	Analyze different types of optical sources and photo detectors, develop Threshold conditions, External quantum efficiency, Laser diode rate equations, Resonant frequencies
C415.5	Evaluate the power coupled in to optical fibers and analyze signal transmission, receiver operation and error sources of optical fiber
C415.6	Design optical system with budget analysis and to classify principles and types of WDM and Measurement of Attenuation and Dispersion, Eye pattern.

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Course Name:	ELECTRONIC SWITCHING SYSTEMS	**Course Index:**	**C416**
REGULATION:	**R16**	**YEAR-SEM:**	**IV-I**

The student will be able to:

CO INDEX	COURSE OUTCOME
C416.1	Get basic knowledge on simple telecommunication system
C416.2	Understand about centralized control of telecommunication networks
C416.3	Know establishing of network connections through switching
C416.4	Analyze routing of telephone networks and transmitting signals over the networks
C416.5	Sense non-blocking networks in telecommunication traffic
C416.6	Know about Integrated voice and data services and about digitalizing network

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Course Name:	ANALOG AND PULSE CIRCUITS	**Course Index:**	**C221**
REGULATION:	**NRIA18**	**YEAR-SEM:**	**II-II**

The student will be able to:

CO INDEX	COURSE OUTCOME
C221.1	Design BJT amplifier using h parameter model
C221.2	Analyze and design electronic subsystems such as feedback amplifiers and oscillators
C221.3	Analyze power amplifiers such as Class A and Class B and compare their performance
C221.4	Design linear and non-linear wave shaping circuits with different inputs
C221.5	Deign and analyze various multi vibrators using transistors
C221.6	Remember and analyze unidirectional and bidirectional sampling gates

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Course Name:	ANALOG COMMUNICATIONS	**Course Index:**	**C222**
REGULATION:	**NRIA18**	**YEAR-SEM:**	**II-II**

The student will be able to:

CO INDEX	COURSE OUTCOME
C222.1	Understand different blocks in communication system & Generation and Detection of AM Waves.
C222.2	Analysis and design of DSB, SSB Modulation Techniques
C222.3	Analyze generation and detection of FM signal & comparison between amplitude and angle modulation schemes.
C222.4	Understand the types of noise affecting communication system and noise parameters. & Design generation & detection of Pulse Modulation techniques.
C222.5	Design and analyze various Pulse modulation techniques
C222.6	Identify different types of transmitters and receivers circuits and role of AGC

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Course Name:	ELECTROMAGNETIC FIELD THEORY	**Course Index:**	**C223**
REGULATION:	**NRIA18**	**YEAR-SEM:**	**II-II**

The student will be able to:

CO INDEX	COURSE OUTCOME
C223.1	Interpret and Apply the static electrostatic fields with respect to coordinate systems.
C223.2	Analyze and Demonstrate the static magnetic fields in real time applications.
C223.3	Formulate the Maxwell's Equations in different forms.
C223.4	Associate the fundamental theory of electromagnetic waves in free space and their practical applications.
C223.5	Evaluate and Relate wave propagation characteristics in different conducting media.
C223.6	Demonstrate the reflection and Refraction of EM waves in normal and oblique incidences

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Course Name:	CONTROL SYSTEMS	**Course Index:**	**C224**
REGULATION:	**NRIA18**	**YEAR-SEM:**	**II-II**

The student will be able to:

CO INDEX	COURSE OUTCOME
C224.1	Understand Closed/Open Loop Control Systems, derive the transfer function of physical systems and determine overall transfer function using block diagram algebra & signal flow graph reduction techniques
C224.2	Study different types of standard test signals, find the output response of first and second order systems, determine time response specifications of second order systems and determine steady state error along with error constants
C224.3	Acquire the skill to analyze absolute and relative stability of LTI systems using Routh-Hurwitz stability criterion and the Root Locus Plot
C224.4	Analyze the stability of LTI systems using frequency response methods using Bode plots & Polar Plots.
C224.5	Analyze the stability of LTI systems using frequency response methods using Nyquist Plots
C224.6	Represent physical systems by State Transition Matrices based state space modeling and determine the output response by understanding the concepts of controllability and observability

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Course Name:	PROBABILITY THEORY & STOCHASTIC PROCESS	**Course Index:**	**C225**
REGULATION:	**NRIA18**	**YEAR-SEM:**	**II-II**

The student will be able to:

CO INDEX	COURSE OUTCOME
C225.1	Understand the axiomatic formulation of modern Probability Theory, Characterize probability models and random variables, function of random variables and formulate fundamental probability distribution and density functions.
C225.2	Explain the concepts of expectation and conditional expectation, Evaluate and apply moments & characteristic functions, transformation of a random variable.
C225.3	Understand the joint distribution function, joint density function, concept of inequalities, and operations on two random variables and multiple random variables.
C225.4	Understand the concept of random processes and determine covariance, Analyze continuous and discrete- time random processes, Explain the concepts of stationary and wide sense stationary process, autocorrelation, cross correlation functions.
C225.5	Understand the concept of random processes, spectral density of stationary random processes and cross power density spectrum, apply the above knowledge to solve basic problems.
C225.6	Apply the theory of stochastic processes to analyze linear systems with random inputs and the systems in the presence of different types of noise sources.

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Course Name:	OOPS through JAVA	**Course Index:**	**C226**
REGULATION:	**NRIA18**	**YEAR-SEM:**	**II-II**

The student will be able to:

CO INDEX	COURSE OUTCOME
C226.1	Understand the use of OOPS Concepts
C226.2	Solve real world problems using OOPS techniques
C226.3	Understand the use of abstract classes and Packages in java.
C226.4	Develop and understand exception handling and Interfaces in java
C226.5	Understand multithreaded applications with synchronization
C226.6	Design GUI based applications and develop applets for web applications

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Course Name:	Micro Processors & Micro Controllers	**Course Index:**	**C321**
REGULATION:	**R16**	**YEAR-SEM:**	**III-II**

The student will be able to:

CO INDEX	COURSE OUTCOME
C321.1	Understand the internal concepts of basic microprocessor 8086 and working on Minimum and maximum mode.
C321.2	Understand the concepts of assembly language programs and development tools.
C321.3	Understand the interfacing concepts of PIC, DMA, PPI, and Keyboard.
C321.4	Understand the basic concepts of advanced processors and its functionality.
C321.5	Understand the internal concepts of basic microcontroller 8051 and their interfacing.
C321.6	Apply the theory of PIC microcontroller and their operation

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Course Name:	Microwave Engineering	**Course Index:**	**C322**
REGULATION:	**R16**	**YEAR-SEM:**	**III-II**

The student will be able to:

CO INDEX	COURSE OUTCOME
C322.1	Analyze different modes of propagation in waveguide structures.
C322.2	Understand fundamental characteristics of Microstrip lines cavity resonators through electromagnetic field analysis.
C322.3	Describe the modes of operation of Klystron tube as microwave tube with calculation of efficiency
C322.4	Analyze the modes of operation of TWT and Magnetron as microwave tubes .
C322.5	Estimate the S-matrix for various waveguide components and analyze the splitting of the microwave energy in a desired direction
C322.6	Understand the operation of microwave Solid state devices and Measure various microwave parameters using a Microwave test bench

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Course Name:	VLSI DESIGN	**Course Index:**	**C323**
REGULATION:	**R16**	**YEAR-SEM:**	**III-II**

The student will be able to:

CO INDEX	COURSE OUTCOME
C323.1	Understand the properties of MOS active devices and IC Fabrication procedure for PMOS, NMOS and CMOS.
C323.2	Understand three sets of design rules with which NMOS and CMOS designs may be fabricated.
C323.3	Understand the scaling factors determining the characteristics and performance of MOS circuits in silicon.
C323.4	Analyze the design for testability techniques and understand the chip input and output circuits
C323.5	Explain the FPGA architecture, design flow, technologies and compare the FPGA families.
C323.6	Classify the power consumption and understand the low power design of interconnects, power grids and clocks

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Course Name:	DIGITAL SIGNAL PROCESSING	**Course Index:**	**C324**
REGULATION:	**R16**	**YEAR-SEM:**	**III-II**

The student will be able to:

CO INDEX	COURSE OUTCOME
C324.1	Understand the representation of different discrete time signals and apply the difference equations concept in the analysis of discrete time systems
C324.2	Interpret and explore the concepts of Discrete Fourier Transforms and Fast Fourier Transforms for various discrete time signals and sequences
C324.3	Design and Realize of Digital IIR filters from Analog filters using analog and digital frequency transforms
C324.4	Design and Realize of Digital FIR filters and analyze its characteristics of frequency response.
C324.5	Implement the sampling rate conversion by Decimation and Interpolation process and apply the concepts of Digital Filter Banks
C324.6	Gain Knowledge about the architecture and functional concepts of commercial programmable Digital Signal Processors.

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Course Name:	Industrial Robotics	**Course Index:**	**C325**
REGULATION:	**R16**	**YEAR-SEM:**	**III-II**

The student will be able to:

CO INDEX	COURSE OUTCOME
C325.1	Identify various robot configuration and components,
C325.2	Select appropriate actuators and sensors for a robot based on specific application
C325.3	Carry out kinematic and dynamic analysis for simple serial kinematic chains
C325.4	Perform differential transformation to robot arms.
C325.5	Perform trajectory planning for a manipulator by avoiding obstacles.
C325.6	Identify various robot actuators and feedback components,

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Course Name:	Biomedical Engineering	**Course Index:**	**C326**
REGULATION:	**R16**	**YEAR-SEM:**	**III-II**

The student will be able to:

CO INDEX	COURSE OUTCOME
C326.1	Explore the importance and Development of Electronics Engineering in medial field to analyze the functionality of Human Body.
C326.2	Understand the working principles of various Electrodes and Transducers in clinical laboratory for obtaining Bio electric potentials.
C326.3	Explain the anatomy of physiological systems and demonstrate the measurements of various tests for Cardio and Respiratory systems.
C326.4	Impart the knowledge and importance of patient monitoring systems and analyze the design, Principle & working operation of various Therapeutic and Prosthetic devices.
C326.5	Understand the basic principle and applications of various medical imaging systems and importance of Bio Telemetry for patient care and patient safety while using medical equipment.
C326.6	Analyze the methods to prevent shock hazards from electrical equipment and explain the working of different types of recorders and monitors.

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Course Name:	Cellular and Mobile Communications	**Course Index:**	**C421**
REGULATION:	**R16**	**YEAR-SEM:**	**IV-II**

The student will be able to:

CO INDEX	COURSE OUTCOME
C421.1	Interpret the cellular mobile radio system operation and design concepts, cell splitting and sectoring.
C421.2	Measure Co-Channel and Non Co-Channel interferences and analyze the various mobile radio propagation models and design of antenna system.
C421.3	Estimate the concepts related to frequency management, channel assignment, channel sharing and channel borrowing techniques and signal reflections inflat and hilly terrain.
C421.4	Design the Omni-directional and directional antennas used at cell sites and their synthesis methods.
C421.5	Apply the vehicle locating methods, various handoff and cell splitting techniques and to estimate dropped call rates in cellular systems.
C421.6	Classify FDMA,T DMA and CDMA multiple access schemes. Discuss the basics of 3G cellular systems.

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Course Name:	Electronic Measurements & Instruments	**Course Index:**	**C422**
REGULATION:	**R16**	**YEAR-SEM:**	**IV-II**

The student will be able to:

CO INDEX	COURSE OUTCOME
C422.1	Understand the basic concepts of various performance characteristics of instruments and working principle and construction of analog meters for the measurement of current, voltage and resistance etc.
C422.2	Analyze the working principle of various waveform generators and able to generate various wave forms and analyze the given spectrum using spectrum analyzers.
C422.3	Understand the construction and principle of operation of oscilloscopes and to measure electrical parameters using oscilloscopes and identify the applications of special oscilloscopes.
C422.4	Design various bridge circuits and their applications in the measurement of different physical parameters like resistance, inductance and capacitance etc.
C422.5	Demonstrate the different types of transducers and their principles and operations.
C422.6	Measure different physical parameters and design different measurement systems using transducers.

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Course Name:	Satellite Communication	**Course Index:**	**C423**
REGULATION:	**R16**	**YEAR-SEM:**	**IV-II**

The student will be able to:

CO INDEX	COURSE OUTCOME
C423.1	Understand the concepts of satellite communications, orbital mechanics and launching vehicles.
C423.2	Discuss about various satellite subsystems.
C423.3	Design the satellite communication links.
C423.4	Demonstrate various Multiple Accessing techniques.
C423.5	Construct earth station technology, low earth orbit and geo-stationary satellite systems.
C423.6	Estimate the satellite Constellations and navigation system.

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Course Name:	WIRELESS SENSOR NETWORKS	**Course Index:**	**C424**
REGULATION:	**R16**	**YEAR-SEM:**	**IV-II**

The student will be able to:

CO INDEX	COURSE OUTCOME
C424.1	Illustrate the familiarity with basic concepts of WSN architectures with some existing applications and to determine its optimization goals.
C424.2	Identify and analyze different topologies and routing algorithms employed in wireless sensor networks like WANETs, MANETs AND PANs
C424.3	Demonstrate the knowledge of different MAC protocols developed for WSN and to understand the necessary scheduling mechanisms.
C424.4	Interpret the design issues of routing protocols for Adhoc Wireless networks and to differentiate them based on classification.
C424.5	Address the key issues and goals in designing the transport layer protocols for Adhoc Wireless networks and to analyze their performance.
C424.6	Apply the knowledge and concepts of various sensor network platforms and tools to analyze the challenges and issues in security provisioning.