RVS COLLEGE OF ENGINEERING AND TECHNOLOGY

COIMBATORE – 641 402

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

COURSE OUTCOMES

Regulation – 2017

COURSE NUMBER	SEMESTER	SUBJECT CODE	NAME OF THE COURSE	COURSE OUTCOMES	
C101	I	HS8151	Communicative English	C01	Communicate clearly both in the written form and orally using appropriate vocabulary and comprehend written texts to make inferences.
				C02	Speak persuasively in different social contexts and write biographical details and technical documents cohesively, coherently and flawlessly using appropriate words.
				C03	Speak, read and write effectively for a variety of professional and social settings.
				C04	Read descriptive, narrative, expository and interpretive texts and write using creative, critical, analytical and evaluative methods
				C05	Listen, comprehend and respond to different spoken and written discourses/excerpts in different accents and write different genres of texts adopting various writing strategies.
C102	I	MA8151	Engineering Mathematics - I	C01	Use both the limit definition and rules of differentiation to differentiate functions.
				C02	Apply differentiation to solve maxima and minima problems.
				C03	Evaluate integrals both by using Riemann sums and by using the Fundamental Theorem of Calculus, also evaluate integrals using techniques of integration, such as substitution, partial fractions and integration by parts, in addition to determine convergence/divergence of improper integrals and evaluate convergent improper integrals.
				C04	Apply integration to compute multiple integrals, area, volume, integrals in polar coordinates, in addition to change of order and change of variables.

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				C05	Apply various techniques in solving differential equations
C103	I	PH8151	Engineering Physics	C01	Analyze the elastic nature of materials and be able to choose the materials dependingupon the modulus of elasticity for different application
				C02	Illustrate the advantages of optical communication using LASER.
				C03	Explain the conducting properties of solids, liquids, good thermal conductor and bad thermal conductors
				C04	Apply the knowledge of quantum mechanics and classical mechanics in addressing the problems related to science and technology
				C05	Describe the crystal structures, crystal defects and various crystal growth techniques
C104	I	CY8151	Engineering Chemistry	C01	Describe the importance of water technology in the purification of water and its domestic and industrial applications.
				C02	Illustrate the concept of absorption in surface chemistry and catalysis and its applications
				C03	Review use of the phase rule in identifying its application in metallurgy and manufacture of alloys.
				C04	Compare the different types of industrial techniques of petroleum processing and the determination of caloric values and combustion parameters.
				C05	Explain the fundamentals of different alternative source of energy, the generation process and batteries
C105	I	GE8151	Problem Solving and Python Programming	C01	Develop algorithmic solutions to simple computational problems
				C02	Demonstrate programs using simple Python statements and expressions.
				C03	Explain control flow and functions concept in Python for solving problems.
				C04	Use Python data structures – lists, tuples & dictionaries for representing compound data
				C05	Explain files, exception, modules and packages in Python for solving problems.
C106	I	GE8152	Engineering Graphics	C01	Familiarize the fundamentals and standards of engineering graphics
				C02	Perform free hand sketching of basic construction and machine equipments.
				C03	Project orthographic projection of lines and plane surfaces

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				C04	Draw the projection of solids and development of solid.
				C05	Visualize and project isometric perspective section of solids and surfaces.
C107	I	GE8161	Problem Solving and Python Programming Laboratory	C01	Write, test, and debug simple Python programs.
				C02	Implement Python programs with conditionals and loops.
				C03	Develop Python programs step-wise by defining functions and calling them.
				C04	Demonstrate the use Python lists, tuples, and dictionaries for representing compound data
				C05	Illustrate the concepts of read and write data from/to files in Python.
C108	I	BS8161	Physics and Chemistry Laboratory	C01	Test materials by using their knowledge of applied physics principles in optics and properties of matter.
				C02	Perform the quantitative chemical analysis of chloride, dissolved oxygen, hardness, alkalinity and copper ions by titration methods.
				C03	Demonstrate basic concepts in the determination of acids, sodium, potassium and iron by the instrumental methods of analysis
C109	II	HS8251	Technical English	C01	Read technical texts and write area specific texts effortlessly.
				C02	Listen and comprehend lectures and talks in their areas of specialization and write effectively for a variety of professional and social settings.
				C03	Speak and write appropriately and effectively in varied formal and informal contexts.
				C04	Write effectively and persuasively and produce different types of writing such as letters, minutes, reports and winning job applications.
				C05	Communicate clearly using technical vocabulary in their professional correspondences.
C110	II	MA8251	Engineering Mathematics - II	C01	Compute the Eigenvalues and eigenvectors, diagonalization of a matrix, Symmetric matrices, Positive definite matrices and similar matrices.
				C02	Find Gradient, divergence and curl of a vector point function and related identities, Evaluation of line, surface and volume integrals using Gauss, Stokes and Green's theorems and their verification.
				C03	Solve problems on Analytic functions and conformal mapping
				C04	Evaluate complex integrals

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				C05	Find Laplace transform and inverse transform of simple functions, properties, various related theorems and application to differential equations with constant coefficients.
C111	II	PH8253	Physics for Electronics Engineering	C01	Explain the properties of conducting materials using classical and quantum concepts.
				C02	Apply the fundamental knowledge about the semiconductors and able to differentiate different types of semiconductors.
				C03	Explain the properties of Magnetic, Dielectric materials and devices for modern day to day applications.
				C04	Explain the properties and applications of Optical materials and devices.
				C05	Apply the knowledge about the Nano-Electronic materials and devices for various applications
C112	II	BE8254	Basic Electrical and Instrumentation Engineering	C01	Explain the operation of three phase electrical circuits and power system.
				C02	Determine the regulation and efficiency of transformers
				C03	Describe the characteristics of DC Generator and Motor
				C04	Analyze the performance of AC and DC machines.
				C05	Apply the concepts of measurements and instruments for real time applications.
C113	II	EC8251	Circuit Analysis	C01	Determine current and voltage in circuits using Ohm's Law, Kirchhoff's laws, mesh current method, node voltage method and network topology
				C02	Apply the Network theorems to the analysis of AC and DC circuits.
				C03	Calculate the response of the series and parallel resonance circuits, coupled circuits and tuned circuits.
				C04	Solve first and second order AC and DC circuits for steady-state and transient response in the time domain using Laplace transforms.
				C05	Understand the concept of two port network, its various parameters and symmetrical
C114	II	EC8252	Electronic Devices	C01	Explain the structure, operations and characteristics of PN Junction diode
				C02	Describe the basic geometry, operation and various configuration of Bipolar Junction Transistor.
				C03	Analyze the operation of various Field Effect Transistors.
				C04	Describe the operations of Special Semiconductor Devices

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				C05	Explain the basic concepts of Power and Display devices.
C115	II	EC8261	Circuits and Devices Laboratory	C01	Analyze the characteristics of basic electronic devices
				C02	Determine the transient response of RL and RC circuits.
				C03	Perform Kirchoff's Current Law and Kirchoff's Voltage Law.
				C04	Verify Thevinin, Norton, Superposition, Maximum Power Transfer and Reciprocity Theorems.
				C05	Determine the Resonant frequency of RLC circuits
C116	II	GE8261	Engineering Practices Laboratory	C01	Construct carpentry components and pipe connections including plumbing works.
				C02	Use welding equipment's to join the structures
				C03	Illustrate the basic machining operations
				C04	Construct the models using sheet metal works
				C05	Describe centrifugal pump, Air conditioner, operations of smithy, foundry and fittings.
				C06	Construct the basic Electrical and Electronics circuits.
				C07	Examine the different types of electronic circuits and components.
				C08	Explain the electrical safety rules, grounding, general house wiring.
				C09	Perform soldering in various electronic circuits.
				C10	Illustrate the basic operation of domestic electrical appliances
C201	III	MA8352	Linear Algebra and Partial Differential Equations	C01	Explain the fundamental concepts of advanced algebra and their role in modern mathematics and applied contexts, to demonstrate accurate and efficient use of advanced algebraic techniques and to demonstrate their mastery by solving non - trivial problems related to the concepts and by proving simple theorems about the statements proven by the text on the topic Vector Spaces.
				C02	Explain the fundamental concepts of advanced algebra and their role in modern mathematics and applied contexts, to demonstrate accurate and efficient use of advanced algebraic techniques and to demonstrate their mastery by solving non - trivial problems related to the concepts and by proving simple theorems about the statements proven by the text on the topic Vector Spaces Diagonalization.

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				C03	Explain the fundamental concepts of advanced algebra and their role in modern mathematics and applied contexts, to demonstrate accurate and efficient use of advanced algebraic techniques and to demonstrate their mastery by solving non - trivial problems related to the concepts and by proving simple theorems about the statements proven by the text on the topic Inner Product Spaces.
				C04	Solve various types of partial differential equations
				C05	Solve engineering problems using Fourier series.
C202	III	EC8393	Fundamentals of Data Structures In C	C01	Develop the programs in C using basic constructs
				C02	Develop the programs in C using function, pointers, structures and unions
				C03	Suggest and Implement appropriate linear data structure operations for any given data set in C
				C04	Suggest and Implement appropriate non-linear data structure operations for a given application in C.
				C05	Appropriately choose the sorting algorithms and also apply hashing concepts for a given problem
C203	III	EC8351	Electronic Circuits- I	C01	Design the various biasing circuits of BJT, JFET and MOSFET.
				C02	Analyze the small signal equivalent and design BJT amplifier circuits
				C03	Analyze the small signal equivalent and design JFET and MOSFET amplifier circuits
				C04	Plot the frequency response of all amplifiers.
				C05	Design the regulated power supply, troubleshoot and analyze the faults in power supplies
C204	III	EC8352	Signals and Systems	C01	Analyze the various properties of signals and systems.
				C02	Apply Laplace transform and Fourier transform in signal analysis.
				C03	Analyze linear time invariant continuous time systems using Laplace and Fourier Transforms.
				C04	Analyze discrete time signals using Z transform and DTFT.
				C05	Interpret the linear time invariant discrete time systems using Z transform and DTFT.
C205	III	EC8392	Digital Electronics	C01	Apply the concepts of digital electronics in the present contemporary world.

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				C02	Design and implement various combinational digital circuits using logic gates.
				C03	Analysis and design synchronous sequential circuits.
				C04	Design and implement asynchronous sequential circuits.
				C05	Apply the concepts of memory devices and programmable logic devices in Integrated Circuits
C206	III	EC8391	Control Systems Engineering	C01	Perform modelling of control system using various techniques
				C02	Obtain the time response and steady state error of control systems.
				C03	Design compensators and to plot the frequency response using various techniques.
				C04	Determine the stability of control systems.
				C05	Analyze and obtain state space model using state variables.
C207	III	EC8381	Fundamentals of Data Structures in C Laboratory	C01	Develop C programs for simple applications making use of basic constructs.
				C02	Apply basic data structures for a given problem using C.
				C03	Implement linear and non-linear data structures using C.
				C04	Implement functions and recursive functions in C.
				C05	Choose appropriate searching, sorting and hashing algorithm for an application and implement it in a modularized way.
C208	III	EC8361	Analog and Digital Circuits Laboratory	C01	Plot the frequency response of CE, CB, CC & CS amplifiers.
				C02	Measure CMRR in differential amplifier
				C03	Analyze the limitation in bandwidth of single stage and multistage amplifiers
				C04	Simulate the amplifiers using SPICE tool
				C05	Design and implement combinational and sequential logic circuits.
C209	III	HS8381	Interpersonal Skills/Listening &Speaking	C01	Speak effectively on various academic topics and respond to questions.
				C02	Converse effectively with the use of conversation starters and discourse markers.
				C03	Listen and respond to various academic dialogues and discussions.
				C04	Participate confidently and appropriately in informal and formal conversations and group discussions
				C05	Use a range of presentation tools like PPT, Videos, and Charts etc. to make an engaging presentation.

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C210	IV	MA8451	Probability and Random Processes	C01	Use the fundamental knowledge of the concepts of probability and standard distributions which can describe real life phenomenon.
				C02	Apply the basic concepts of one and two dimensional random variables in engineering applications.
				C03	Apply the concept random processes in engineering disciplines
				C04	Apply the concept of correlation and spectral densities.
				C05	Analyse the response of random inputs to linear time invariant systems
C211	IV	EC8452	Electronic Circuits II	C01	Analyze the concepts of Feedback Amplifiers in various applications
				C02	Design different types of Oscillator at different frequencies.
				C03	Analyze the performance of Tuned amplifiers
				C04	Design Pulse circuits and Multi vibrators
				C05	Apply the various design techniques to analyze Power Amplifiers and DC convertors
C212	IV	EC8491	Communication Theory	C01	Analyze the various modulation techniques used for communication.
				C02	Elaborate the angle modulation and demodulation techniques.
				C03	Apply the concepts of Random Process.
				C04	Analyze the noise performance of AM and FM systems.
				C05	Implement the basic concepts of source and channel coding in design of communication system.
C213	IV	EC8451	Electromagnetic Fields	C01	Apply the basic mathematical concepts of vector analysis and display an understanding of fundamental electromagnetic laws and concepts
				C02	Solve simple problems requiring estimation of electric and magnetic field quantities based on these concepts and laws
				C03	Develop concepts of Magneto static fields and apply boundary conditions
				C04	Analyze the relation between the fields under time varying situations and apply Maxwell's equations to electric and magnetic fields
				C05	Derive Electromagnetic wave equation and apply the Poynting expression. Propagation of EM wave in free space, conductors & dielectrics.
C214	IV	EC8453	Linear Integrated	C01	Design linear and non-linear applications of op-amps.

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			Circuits	C02	Design applications using Analog multipliers and PLL
				C03	Design ADC and DAC using op-amps.
				C04	Design waveform Generators using op-amps.
				C05	Analyze special function ICs.
C215	IV	GE8291	Environmental Science and Engineering	C01	Summarize the importance of environment, biodiversity, ecosystem and how to solve environmental related problems.
				C02	Describe the causes, effect and control measures of air pollution, water pollution, soil pollution, noise pollution, radioactive pollution and thermal pollution with their relevant case studies.
				C03	Discuss the various renewable and non-renewable resources and energy conservation processes.
				C04	Explain the social issues and solutions for sustainable environment with relevant Acts and case studies.
				C05	Review the impact of human population in the environment and its remedial measures.
C216	IV	EC8461	Circuits Design and Simulation Laboratory	C01	Differentiate feedback amplifiers with oscillators
				C02	Calculate the frequency response & the output impedance for various types of feedback amplifiers
				C03	Design different types of RC, LC oscillators and tuned amplifiers
				C04	Analyze the various types of wave shaping circuits and multivibrators
				C05	Simulate oscillators, tuned amplifiers and power amplifiers using SPICE tool
C217	IV	EC8462	Linear Integrated Circuits Laboratory	C01	Analyze the basics of linear integrated circuits and available ICs.
				C02	Design the oscillators, amplifiers and filters using operational amplifiers.
				C03	Analyze and implement the frequency multiplier using PLL
				C04	Design DC power supply using ICs
				C05	Analyze the performance of filters, Multivibrators, A/D converters and analog multiplier using SPICE.
C301	V	EC8501	Digital Communication	C01	Design applications using the various source coding techniques.
				C02	Interpret the various waveform coding schemes and their representation.
				C03	Analyze the various baseband transmission schemes.

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				C04	Develop applications using the various band pass signalling schemes
				C05	Apply the basic concepts of channel coding techniques.
C302	V	EC8553	Discrete-Time Signal Processing	C01	Apply Discrete Fourier Transform (DFT) for the analysis of digital signals and systems. Compute DFT of a given discrete time sequence using FFT
				C02	Design an analog to digital Infinite Impulse Response (IIR) filters for a given specification and its realization.
				C03	Design of digital Finite Impulse Response (FIR) filters using the windowing technique & frequency sampling method and to realize their structure.
				C04	Analyze the effects of finite word length on filter implementation
				C05	Apply the design of filters for real time applications
C303	V	EC8552	Computer Architecture and Organization	C01	Analyze the performance of the computer system and understand the different instructions formats in MIPS architecture.
				C02	Illustrate the internals of arithmetic and logic units for fixed point and floating point operations
				C03	Describe the purposes of data path and control path, pipeline for execution of instructions and its hazards.
				C04	Explain the various memory organizations with its performances, internal communications methodologies for I/O devices.
				C05	Interpret the various parallel processing architectures, principles and their challenges.
C304	V	EC8551	Communication Networks	C01	Describe the concepts of the network fundamentals and different layers.
				C02	Identify the components required to build different types of networks and internetworking protocols.
				C03	Apply the concept of various protocols in routing and multicasting.
				C04	Explain the flow of information from one node to another in the networks.
				C05	Analyze the operations of various application layer protocols such as WWW, HTTP, and DNS.
C305	V	EC8073	Professional Elective I- Medical Electronics	C01	Explain about the physiological parameters and recording methods
				C02	Analyze the bio-chemicals and various physiological information
				C03	Describe various assist devices used in hospitals.

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				C04	Explain the equipment used for physical medicine and the various recently developed diagnostic and therapeutic techniques.
				C05	Apply the concepts of medical Instrumentation in recent technology (Radio pill, Telemedicine, End microscopy unit).
C306	V	ORO551	Open Elective I- Renewable Energy Sources	C01	Explain the physics of solar radiation
				C02	Discuss the classification of solar energy collectors and methodologies of storing solar energy.
				C03	Illustrate the concepts of solar energy utilization in a useful way and applications of solar energy.
				C04	Describe the concepts in wind energy and biomass with its economic aspects.
				C05	Analyze in capturing and applying other forms of energy sources like geothermal, Wave, Tidal, OTEC, mini-hydel energies
C307	V	CS8493	Professional Elective - Operating Systems	C01	Analyze various scheduling algorithms
				C02	Understand deadlock, prevention and avoidance algorithms
				C03	Compare and contrast various memory management schemes.
				C04	Understand the functionality of file systems
				C05	Perform administrative tasks on Linux Servers and compare iOS and Android Operating Systems
C308	V	EC8074	Professional Elective - Robotics and Automation	C01	Explain the concepts of industrial robots in terms of classification, specifications and coordinate systems, along with the need and application of robots & automation.
				C02	Examine different sensors and actuators for applications like maze solving and self driving cars.
				C03	Design a 2R robot & an end-effect or and solve the kinematics and dynamics of motion for robots.
				C04	Explain navigation and path planning techniques along with the control architectures adopted for robot motion planning.
				C05	Describe the impact and progress in AI and other research trends in the field of robotics.
C309	V	EC8075	Professional Elective - Nano Technology and	C01	Describe the basic science behind the properties of materials
				C02	Interpret the creation, characterization, and manipulation of nano scale materials.

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			Apllications	C03	Describe the Properties and measurement of nano materials
				C04	Discuss the exciting applications of nanotechnology at the leading edge of scientific research
				C05	Apply their knowledge of nanotechnology to identify how they can be exploited for new applications
C310	V	GE8074	Professional Elective - Human Rights	C01	Explain the meaning and Development of Human Rights.
				C02	Evaluation of the concept of Human Rights and Universal Declaration of HR.
				C03	Explain the theories of UN Laws and UN Agencies
				C04	Describe the concept of Human Rights in India
				C05	Describe the Human Disadvantaged People and Role of NGO's
C311	V	GE8077	Professional Elective - Total Quality	C01	Explain the importance of quality and Deming's philosophy.
				C02	Describe the process of continuous improvement.
				C03	Apply traditional and quality management tools and techniques to manufacture and service process
				C04	Develop Java applications with threads and generics classes
				C05	Access the implementation of ISO 9000/9001-2008 , 14000 for manufacturing and service sector
C312	V	EC8562	Digital Signal Processing Laboratory	C01	Generate various signals using MATLAB and DSP processor
				C02	Implement Linear and circular convolution programs and Frequency Analysis using DFT in MATLAB
				C03	Implement Auto correlation and Cross Correlation using MATLAB
				C04	Design FIR and IIR Filters using MATLAB and DSP Processor
				C05	Analyze the architecture of a DSP Processor and to implement Up-sampling and Down-sampling operation in DSP Processor
C313	V	EC8561	Communication Systems Laboratory	C01	Analyze the effects of sampling and TDM
				C02	Design AM & FM modulation and demodulation
				C03	Implement Pulse Code Modulation and Delta Modulation
				C04	Implement the signal constellations of Digital Modulation schemes
				C05	Implement various Error control coding schemes

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C314	V	EC8563	Communication Networks Laboratory	C01	Perform client-server communication between two desktop computers using Socket Programming.
				C02	Implement the different protocols
				C03	Simulate various network topologies like Star, Bus and Ring.
				C04	Implement and compare the different routing algorithms.
				C05	Simulate the algorithms with the help of Network Simulator tool.
C315	VI	EC8691	Microprocessors and Microcontrollers	C01	Describe the architecture of microprocessor 8086 and execute programs based on 8086 microprocessor.
				C02	Explain about design aspects of I/O and Memory Interfacing circuits.
				C03	Interface 8086 microprocessors with supporting chips.
				C04	Describe the architecture of microcontroller 8051.
				C05	Implement 8051 microcontroller based systems
C316	VI	EC8095	VLSI Design	C01	Realize the concepts of digital building blocks using MOS transistor.
				C02	Design combinational MOS circuits and power strategies
				C03	Design and construct Sequential Circuits and Timing systems
				C04	Design arithmetic building blocks and memory subsystems.
				C05	Apply and implement FPGA design flow and testing.
C317	VI	EC8652	Wireless Communication	C01	Elaborate the characteristics of a wireless channel and evolve the system design specifications
				C02	Apply the various cellular concepts like frequency reuse, channel assignments, handoff strategies etc., in mobile communication
				C03	Analyze the performance of various digital signalling schemes of fading channels
				C04	Apply the multipath mitigation techniques based on the application.
				C05	Implement the concept of transmit/receive diversity in MIMO systems.
C318	VI	MG8591	Principles of Management	C01	Discuss the evolution of management, functions and roles of managers.
				C02	Explain the different types of planning process and tools used for planning
				C03	Elaborate different organization structures and functions of human resources manager.

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				C04	Interpret the concepts in motivation techniques, leadership and communication processes
				C05	Describe the control techniques and the role of technology in management.
C319	VI	EC8651	Transmission Lines and RF Systems	C01	Analyze the various types of transmission lines and the losses associated.
				C02	Analyze different parameters and constraints in high frequency transmission of information.
				C03	Analyze impedance matching by stubs using smith charts.
				C04	Analyze the characteristics of TE and TM waves in Guided systems.
				C05	Design a RF transceiver system for wireless communication.
C320	VI	EC8004	Professional Elective - II - Wireless Networks	C01	Explain the various protocols and standards of wireless LAN.
				C02	Describe the protocols for mobile network layer and routing in mobile ad-hoc network
				C03	Illustrate the 3G Overview.
				C04	Discuss about the different wireless WAN architectures.
				C05	Explain the 4G technologies and its applications
C321	VI	EC8681	Microprocessors and Microcontrollers Laboratory	C01	Write ALP programmes for arithmetic operation, logical operations and data movement using 8086 microprocessor instructions.
				C02	Implement ALP programmes for code conversion, decimal arithmetic and matrix operations using 8086 instructions
				C03	Generate result for floating point operations, string manipulations, sorting, Searching, Password checking, Print RAM size, System Date, Counters and Time Delay using 8086 microprocessor and MASM software
				C04	Design 8086/8051 based systems using peripherals and interfaces.
				C05	Calculate outputs for arithmetic operation, logical operation, square of a number and cube of a number using 8051 microcontroller/MASAM software.
C322	VI	EC8661	VLSI Design Laboratory	C01	Write HDL code for basic as well as advanced digital integrated circuit.
				C02	Import the logic modules into FPGA Boards.
				C03	Synthesize Place and Route the digital IPs
				C04	Design, Simulate and Extract the layouts of Digital IC Blocks using EDA tools.
				C05	Design, Simulate and Extract the layouts of Analog IC Blocks using EDA tools

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C323	VI	EC8611	Technical Seminar	C01	Explain the significance of learning recent advancement in electrical and electronics engineering discipline.
				C02	Review and prepare the State-of-art technologies in the present technological developments.
				C03	Organize the presentation using the concepts of ordering and determining the central, main and supporting ideas.
				C04	Present any topic in any recent advancement with good communicative skill infront of peers and faculty members.
				C05	Perform well in placement recruitment drive with good technical skills and communication skills.
C324	VI	HS8581	Professional Communication	C01	Exhibit soft skills and awareness of different cultures in varied contexts.
				C02	Make effective presentations
				C03	Participate confidently in Group Discussions.
				C04	Attend job interviews and be successful in them.
				C05	Set short-term and long-term career goals.
C325	VI	CS8792	Professional Elective - Cryptography and Network Security	C01	Understand the fundamentals of networks security, security architecture, threats and vulnerabilities
				C02	Apply the different cryptographic operations of symmetric cryptographic algorithms
				C03	Apply the different cryptographic operations of public key cryptography.
				C04	Apply the various Authentication schemes to simulate different applications.
				C05	Understand various Security practices and System security standards.
C326	VI	EC8091	Professional Elective - Advanced digital signal processing	C01	articulate and apply the concepts of special random process in pratical applications
				C02	chooses appropriate spectrum estimation techniques for a given random process
				C03	Apply optimum filters appropriately for a given communication system
				C04	Apply appropriate adaptive algorithm for processing non-stationary signals
				C05	Apply and analyse wavelet transforms for signal and image processing based application
C327	VI	EC8001	Professional Elective -	C01	Interpret the basics of micro/Nano electromechanical systems including their

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			MEMS and NEMS		application and advantages
				C02	Recognize the use of materials in micro fabrication and describe the fabrication processes including surface micromachining bulk micromachining and LIGA
				C03	Analyze the key performance aspects of electromechanical devices using sensors
				C04	Analyze the key performance aspects of electromechanical devices using actuators
				C05	Comprehend the theoretical foundations of quantum mechanics and Nano systems
C328	VI	EC8002	Professional Elective - Multimedia Compression and Communication	C01	Design audio compression techniques
				C02	Configure image and video compression techniques
				C03	Configure Text compression techniques.
				C04	Select suitable service model for specific application
				C05	Configure multimedia communication network
C329	VI	EC8003	Professional Elective - Intellectual Property Rights Design	C01	Realize the concepts of Analog MOS devices and current mirror circuits
				C02	Design different configuration of Amplifiers and feedback circuits
				C03	Analyze the characteristics of frequency response of the amplifier and its noise
				C04	Analyze the performance of the stability and frequency compensation techniques of op amp circuits
				C05	Construct switched capacitor circuits and PLLs
C330	VI	GE8075	Professional Elective - Intellectual Property Rights	C01	understand the knowledge of the basic principles and sources of international intellectual property and human right
				C02	analyze the interaction between national and international Registration, Patents and designs
				C03	Understand the knowledge of copy right, trademarks, designs and information technology act
				C04	Analyses and evaluate complicated international legal issues of intellectual property issues from a human right perspective and digital innovations
				C05	Discuss in a qualified manner, of intellectual property issues from human right perspective

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C401	VII	EC8701	Antennas and Microwave Engineering	C01	Analyze the basic antenna parameters and link power budget.
				C02	Describe the design and radiation mechanism of various types of antennas.
				C03	Explain about the various kinds of antenna arrays.
				C04	Explain the basic concept of various microwave devices
				C05	Design a microwave system for the given application
C402	VII	EC8751	Optical Communication	C01	Apply the fundamental concept of optical fiber modes and their configurations
				C02	Analyze the various signal degradation factors associated with optical fiber.
				C03	Explain the Various optical sources and optical detectors and their use in the optical communication system
				C04	Apply the techniques required to measure the optical fiber systems based on the applications
				C05	Analyze the Digital Transmission and its associated parameters on system performance
C403	VII	EC8791	Embedded and Real Time Systems	C01	Explain the fundamental concepts of designing and the computing required for Embedded Systems.
				C02	Describe the architecture and programming of ARM processor
				C03	Apply the programming concepts in embedded system.
				C04	Analyze the techniques required for creating Real Time Embedded Systems.
				C05	Apply the concepts of scheduling in Real Time Operating System and creating the model for Real Time applications.
C404	VII	EC8702	Ad hoc and Wireless Sensor Networks	C01	Explain the Basics of Adhoc networks and Wireless Sensor Networks
				C02	Apply suitable routing algorithm based on network and user requirement
				C03	Identify appropriate physical and MAC Layer protocols
				C04	Describe the transport layer and security issues possible in wireless sensor networks
				C05	Apply sensor network platforms and tools for various applications
C405	VII	GE8071	Professional Elective -	C01	Discuss about disasters, their significance and types
				C02	Explain the relation between vulnerability, disaster, disaster prevention and risk reduction
				C03	Identify approaches of Disaster Risk Reduction (DRR).

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			III - Disaster Management	C04	Create awareness of institutional process in India.
				C05	Develop rudimentary ability to respond their surrounding with potential disaster response in living area
C406	VII	OCE751	Open Elective II Environmental and Social Impact Assessment	C01	Understand the necessity to study the impacts of development on environment.
				C02	Carry out scoping and screening of developmental projects for environmental and social assessments and explain different methodologies for environmental impact prediction and assessment.
				C03	Plan environmental impact assessments, environmental management plans and evaluate environmental impact assessment reports.
				C04	Carry out economic valuation of environmental impacts.
				C05	Conduct case studies on different types of projects pertaining EIA.
C407	VII	EC8711	Embedded Laboratory	C01	Write programs in ARM for a specific application
				C02	Interface memory, A/D and D/A convertors with ARM system.
				C03	Analyze the performance of interrupt..
				C04	Write program for interfacing keyboard, display, motor and sensor
				C05	Formulate a mini project using embedded system
C408	VII	EC8761	Advanced Communication Laboratory	C01	Analyze the performance of simple optical link by measurement of losses
				C02	Analyze the mode characteristics of fiber, eye pattern and the impact on BER
				C03	Estimate the wireless channel characteristics and analyze the performance of wireless communication system
				C04	Understand the intricacies in microwave system design and analyze the characteristics of Directional Couplers, Isolators, Circulators
				C05	Understand the characteristics of Gunn diode and Microwave IC filter
C409	VII	EC8092	Advanced Wireless Communication	C01	Apply the knowledge about the importance of improving the data rate of wireless channel using MIMO
				C02	Discuss about characteristics of wireless fading channels
				C03	Discuss the significance of channel impairment mitigation using space-time block codes
				C04	Discuss channel impairment mitigation using Trellis codes

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C410	VII	EC8071	Professional Elective - Cognitive Radio	C01	Discuss the evolving software defined radio and cognitive radio techniques and their essential functionalities
				C02	Describe the basic architecture and standard for cognitive radio.
				C03	Develop the ability to design and implement algorithms for cognitive radio spectrum sensing and dynamic spectrum access
				C04	Design a speech recognition system
				C05	Use different speech synthesis techniques
C411	VII	GE8072	Professional Elective - Foundation Skills in Integrated Product Development	C01	Define, formulate and analyze a problem.
				C02	Solve specific problems independently or as part of a team
				C03	Gain knowledge of the Innovation & Product Development process in the Business Context
				C04	Work independently as well as in teams
				C05	Manage a project from start to finish.
C412	VII	CS8082	Professional Elective - Machine Learning Techniques	C01	Differentiate between supervised, unsupervised, semi-supervised machine learning approaches.
				C02	Apply specific supervised or unsupervised machine learning algorithm for a particular problem.
				C03	Analyse and suggest the appropriate machine learning approach for the various types of problem.
				C04	Design and make modifications to existing machine learning algorithms to suit an individual application
				C05	Provide useful case studies on the advanced machine learning algorithms
C413	VII	EC8005	Professional Elective - Electronics Packaging and Testing	C01	Discuss the various types of IC packaging
				C02	Identify the electrical issues, digital and RF issues
				C03	Explain various IC technologies and bonding
				C04	Describe PCB/CAD tools for design, fabrication of SMT
				C05	Discuss the IC packaging concepts
C414	VII	EC8006	Professional Elective - Mixed Signal IC Design	C01	Apply the concepts for mixed signal MOS circuit
				C02	Analyze the characteristics of IC based CMOS filters
				C03	Design of various data converter architecture circuits.

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				C04	Analyze the signal to noise ratio and modeling of mixed signals.
				C05	Design of oscillators and phase lock loop circuit
C415	V III	GE8076	Professional Elective IV - Professional Ethics in Engineering	C01	Describe an awareness of human values to appreciate the rights of others and stress management
				C02	Illustrate the moral issues and models of professional roles.
				C03	Discuss the ethical issues related to engineering and realize the responsibilities and rights in the society.
				C04	Describe the responsibilities, rights and assesses of the safety and risk.
				C05	Apply the social responsibility on multinational corporations related to engineering.
C416	VIII	EC8093	Professional Elective IV - Digital Image Processing	C01	Explain the fundamentals of digital image processing techniques
				C02	Explain the various image enhancement techniques in spatial and frequency domain.
				C03	Analyze the various filtering methods for image restoration
				C04	Learn the basics of segmentation, features extraction and different segmentation techniques
				C05	Use various coding techniques for image compression and image Recognition
C417	VIII	EC8094	Professional Elective V - Satellite Communication	C01	Describe about satellite orbits.
				C02	Discuss the satellite segment and earth segment.
				C03	Describes the concepts satellite access.
				C04	Explains the applications of satellite
				C05	Apply the concept to satellite network
C418	VIII	EC8072	Professional Elective - Electro Magnetic Interference and Compatibility	C01	Identify the various types of electromagnetic interference.
				C02	Explain the various types of coupling mechanism
				C03	Discuss suitable EMI mitigation technique
				C04	Discuss EMI free PCB layout design
				C05	Describe the various EMC standards and various methods
C419	VIII	EC8007	Professional Elective - Low power SoC	C01	Identify sources of power in an IC.
				C02	Understand basic principle of System on Chip design

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			Design	C03	Learn optimization of power in combinational and sequential logic machines for SoC Design
				C04	Identify suitable techniques to reduce the power dissipation and design circuits with low power dissipation.
				C05	Understand the floor planning concepts and its various issues & challenges
C420	VIII	EC8008	Professional Elective - Photonic Networks	C01	Explain functions of various optical network components.
				C02	Discuss the broadcast-and-select and wavelength routing networks
				C03	Explain the different optical network architectures
				C04	Explain photonic packet switching concepts and access networks
				C05	Discuss the different network management functions
C421	VIII	EC8009	Professional Elective - Compressive Sensing	C01	Explain the necessity of compressive sensing technology
				C02	Discuss the basic theory to reconstruct sparse or nearly sparse signals from under sampled data
				C03	Use recent ideas in modern convex optimization allowing rapid signal recovery
				C04	Design a new algorithm or modify an existing algorithm for different application areas in wireless sensor network
				C05	Apply compressive techniques in real world
C422	VIII	EC8010	Professional Elective - Video Analytics	C01	Explain the need for video Analytics and video analytic components
				C02	Explain the various foreground extraction techniques OR Design custom made video analytics system for the given target application
				C03	Explain the different classifiers used for image classification applications
				C04	Design video analytic algorithms for security applications
				C05	Design video analytic algorithms for business intelligence and traffic monitoring and assistance
C423	VIII	EC 8011	Professional Elective - DSP Architecture and Programming	C01	Analyze the concepts of Digital Signal Processors
				C02	Discuss the Programmable DSP's Architecture, On-chip Peripherals and Instruction set.
				C03	Demonstrate their ability to program the DSP processor for signal processing applications
				C04	Analyze the concepts of Advanced Programmable DSP Processors

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				C05	Analyze various Advanced DSP Processors for real-time signal processing applications
C424	VIII	CS8086	Professional Elective - Soft Computing	C01	Apply various soft computing frame works.
				C02	Distinguish various neural networks.
				C03	Use fuzzy logic
				C04	Apply genetic programming
				C05	Discuss hybrid soft computing
C425	VIII	IT8006	Professional Elective - Principles of Speech Processing	C01	To analyze and to study the speech signal Characteristics.
				C02	Design speech compression techniques
				C03	Configure speech recognition techniques
				C04	Design speaker recognition systems
				C05	Design text to speech synthesis systems
C426	VIII	GE8073	Professional Elective - Fundamentals of Nano Science	C01	Discuss about the basics of Nano material science with its classification.
				C02	Demonstrate the preparation of Nano materials
				C03	Develop knowledge in characteristic Nano materials.
				C04	Explain about the various characterization techniques.
				C05	Discuss the exciting applications of nanotechnology at the leading edge of scientific research.
C427	VIII	EC8811	Project Work	C01	Identify challenging practical problems, solutions to cope up with present scenario of Electronics and Communication Engineering field.
				C02	Analyze the various methodologies and technologies and discuss with team for solving the problem
				C03	Apply technical knowledge and project management skills for solving the problem.
				C04	Design and develop hardware and/or software for their project specific problem.
				C05	Prepare the project reports and give proper explanation during the presentation and demonstration.

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