



ADITYA COLLEGE OF ENGINEERING & TECHNOLOGY

Aditya Nagar, ADB Road, Surampalem - 533 437

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

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1. Programme Outcomes (POs)

PO1. Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. Problem Analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3. Design/Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4. Conduct Investigations of Complex Problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

PO6. The Engineer and Society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. Environment and Sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, give and receive clear instructions.

PO11. Project Management and Finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. Life-Long Learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.



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2. List of Course in B.Tech. Electronics and Communication Engineering A.Y:2020-21

S. No.	Course Name	Course Code
First Year - First Semester		
1	Communicative English	C111
2	Mathematics -I	C112
3	Applied Chemistry	C113
4	Programming for Problem Solving Using C	C114
5	Engineering Drawing	C115
6	English Communication Skills Laboratory	C116
7	Applied Chemistry Lab	C117
8	Programming for Problem Solving using C Lab	C118
First Year - Second Semester		
9	Mathematics – II	C121
10	Applied Physics	C122
11	Object Oriented Programming through Java	C123
12	Network Analysis	C124
13	Basic Electrical Engineering	C125
14	Electronic workshop Lab	C126
15	Basic Electrical Engineering Lab	C127
16	Applied Physics Lab	C128
17	Environmental Science	C129
Second Year - First Semester		
18	Electronic Devices and Circuits	C211
19	Switching Theory and Logic Design	C212
20	Signals and Systems	C213
21	Random Variables and Stochastic Processes	C214
22	Object Oriented Programming through Java	C215
23	Managerial Economics & Financial Analysis	C216
24	Electronic Devices and Circuits - Lab	C217
25	Switching Theory and Logic Design – Lab	C218
26	Constitution of India	C219
Second Year - Second Semester		
27	Electronic Circuit Analysis	C221
28	Linear Control Systems	C222
29	Electromagnetic Waves and Transmission Lines	C223
30	Analog Communications	C224
31	Computer Architecture and Organization	C225
32	Management and Organizational Behavior	C226
33	Electronic Circuit Analysis Lab	C227
34	Analog Communications Lab	C228
Third Year - First Semester		
35	Computer Architecture and Organization	C311
36	Linear IC Applications	C312
37	Digital IC Applications	C313
38	Digital Communications	C314
39	Antenna and Wave Propagation	C315
40	Pulse and Digital Circuits Lab	C316
41	Linear IC Applications Lab	C317
42	Digital IC Applications Lab	C318
43	Professional Ethics & Human Values	C319



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	Third Year - Second Semester	
44	Micro Processors & Micro Controllers	C321
45	Micro Wave Engineering	C322
46	VLSI Design	C323
47	Digital Signal Processing	C324
48	Bio-Medical Engineering	C325
49	Micro Processors & Micro Controllers Lab	C326
50	VLSI Lab	C327
51	Digital Communications Lab	C328
52	IPR & Patents	C329
	Fourth Year - First Semester	
53	Radar Systems	C411
54	Digital Image Processing	C412
55	Computer Networks	C413
56	Optical Communications	C414
57	Electronic Switching Systems	C415
58	Embedded Systems	C416
59	Micro Wave Engineering & Optical Lab	C417
60	Digital Signal Processing Lab	C418
	Fourth Year - Second Semester	
61	Cellular Mobile Communications	C421
62	Electronic Measurements and Instrumentation	C422
63	Satellite Communications	C423
64	Wireless sensors & Networks	C424
65	Seminar	C425
66	Project	C426



3. Course Outcomes of B. Tech. ECE First Year – First Semester

Course Name with Code	CO No.	Course Outcome
Communicative English (C111)	CO1	Identifying the life of people, culture and tradition interpreting the information, speaking English to elicit information, identifying the vocabulary and Nouns
	CO2	Understanding the responsibility and values , conversing for expressing greetings and leave takings, usage of articles, prepositions
	CO3	Remembering life and contributions of Stephen Hawking discuss about specific topics practice letter writing, CVs, E-mail etiquette, application of verb forms
	CO4	Understanding the life of Wangari Maathai, Role plays, use of adjectives and adverbs, vocabulary
	CO5	Understanding way of life and values,, Technical writing and presentation, Vocabulary, common errors
	CO6	Understanding soft skills, recognize Scientific and Technical English
Mathematics -I (C112)	CO1	Utilize mean value theorems to real life problems
	CO2	Able to form differential equation from physical problems and to solve various first order differential equations.
	CO3	Solve the differential equations related to various engineering fields
	CO4	Familiarize with functions of several variables which is useful in optimization
	CO5	Apply double integration techniques in evaluating areas bounded by region
	CO6	Students will also learn important tools of calculus in higher dimensions. Students will become familiar with 2- dimensional and 3-dimensional coordinate systems
Applied Chemistry (C113)	CO1	Analyze the different types of plastic materials and the mechanism of conduction in conducting polymers.
	CO2	Utilize the theory of construction of electrodes, batteries and fuel cells in redesigning engineering products and the reasons for corrosion and study methods to control corrosion.
	CO3	Synthesize nanomaterials for modern advances of engineering technology
	CO4	Summarize the preparation of semiconductors; Analyze the applications of liquid crystals and superconductors.
	CO5	Analyze the principles of different spectroscopic methods and their applications and design models for energy by different natural sources.
	CO6	Obtain the knowledge of computational chemistry and molecular machines
Programming for Problem Solving using C (C114)	CO1	To write algorithms and to draw flowcharts for solving problems, converts both to C program finally compile and debug the programs.
	CO2	To use different operators, data types and write programs that use two-way/ multi-way selection.
	CO3	To select the best loop construct for a given problem
	CO4	To design and implement programs to analyze the different pointer applications
	CO5	To decompose a problem into functions and to develop modular reusable code
	CO6	To apply File I/O operation
Engineering Drawing (C115)	CO1	Understand plane geometry by drawing different engineering curves like ellipse, cycloids, involute etc.
	CO2	Identify the position of points and lines with use of orthographic projections.
	CO3	Analyze the location and position of plane figures through orthographic projections.
	CO4	Analyze the location and position of solid bodies through orthographic projections.
English Communication Skills Laboratory (C116)	CO1	Develop 2D and 3D objects by converting their views
	CO2	Understand the AutoCAD commands
	CO3	Articulate better pronunciation through stress or word accent, intonation, and rhythm.
	CO4	Acting out about a consistent accent and intelligibility in their pronunciation of English by providing an opportunity for practice in speaking.
	CO5	Experimenting the fluency in spoken English and neutralize mother tongue influence
Applied Chemistry Lab (C117)	CO1	Mind Mapping of the students to a variety of self-instructional and learner-friendly modes of language learning.
	CO2	Understand different types of chemical analysis
	CO3	Experiment volumetric analysis of various classes
	CO4	Use some commonly employed simple instruments
	CO5	Gains Knowledge on various concepts of a C language.
	CO6	Able design and development of C problem solving skills.
Programming for Problem Solving using C Lab (C118)	CO1	Able to design and develop modular programming skills.
	CO2	Able to design and develop file programming skills
	CO3	Identifying the life of people, culture and tradition interpreting the information, speaking English to elicit information, identifying the vocabulary and Nouns
	CO4	Understanding the responsibility and values , conversing for expressing greetings and leave takings, usage of articles, prepositions.
	CO5	Remembering life and contributions of Stephen Hawking discuss about specific topics practice letter writing, CVs, E-mail etiquette, application of verb forms
	CO6	Understanding the life of Wangari Maathai, Role plays, use of adjectives and adverbs, vocabulary



4. Course Outcomes of B. Tech. ECE First Year – Second Semester

Course Name with Code	CO No.	Course Outcome
Mathematics-II (C121)	CO1	Compute Line, Surface, Volume integrals using Green's, Stoke's and Divergence theorems.
	CO2	Use Laplace Transform methods to solve initial value problems for constant coefficient linear ordinary differential equations.
	CO3	Discuss the expansion of a given periodic function by Fourier series in the given interval.
	CO4	Solve engineering problems using Fourier Transforms and Inverse Fourier Transforms.
	CO5	Apply a range of techniques to solve first and second order linear partial differential equations.
	CO6	Model physical phenomena of Heat and Wave equations by using Partial differential equations.
Applied Physics (C122)	CO1	Understand the concept of error and its analysis.
	CO2	Compare the theory and correlate with experiment findings.
	CO3	Understand and apply the fundamentals of wave optics.
	CO4	Develop experimental skills on basic physics experiments.
	CO5	Apply object oriented programming features and concepts for solving given problem
	CO6	Solve real time problems using the concepts of class, inheritance, interface and packages
Object Oriented Programming through Java (C123)	CO1	Design the real time applications using graphical user interface
	CO2	Describe the applet life cycle and methods
	CO3	Demonstrate the I/O classes and methods
	CO4	Develop real time applications using multithreading and exception handling
	CO5	Interpret basic R,L,C circuit behavior for dc source
	CO6	Analyze different R,L,C circuit combinations transients with AC & DC sources
Network Analysis (C124)	CO1	Solve various AC complex impedance circuits
	CO2	Determine Q-factor, bandwidth for series & parallel circuits
	CO3	Apply various two port networks to electronic devices, transmission lines & amplifier circuits.
	CO4	Analyze coupled circuits like transformers, generators & motors
	CO5	Discuss the operation of DC generator and analyze the characteristics of DC generator
	CO6	Analyze starting and speed control methods of DC motors along with principle of operation
Basic Electrical Engineering (C125)	CO1	Draw the equivalent circuit of single phase transformer and also compute efficiency
	CO2	Explain the operation of Synchronous Machines
	CO3	Analyze the performance and speed – torque characteristics of 3-phase induction motor
	CO4	Understand the operation of various special machines
	CO5	To identify different active and passive components and to find their values theoretically.
	CO6	To identify different measuring and supply instruments.
Electronic workshop Lab (C126)	CO1	Perform soldering for a given electronic circuit.
	CO2	Design and to make PCB for a simple electronic circuit.
	CO3	Testing of electronic components using appropriate measuring instrument.
	CO4	Observe and measure the voltage and frequency of waveform using CRO.
Basic Electrical Engineering Lab (C127)	CO1	Determine Magnetization characteristics of D.C. Shunt generator.
	CO2	Calculate efficiency of dc machine & single phase transformer Induction motor.
	CO3	Compare and control Speed of D.C.shunt motor above and below rated speeds.
	CO4	Compute regulation of three phase alternator
	CO5	Predict no load and full load losses of single phase transformer without loading transformer.
	CO6	Analyze performance of shunt motor, three phase induction motor
Applied Physics Lab (C128)	CO1	Understand the concept of error and its analysis.
	CO2	Compare the theory and correlate with experiment findings.
	CO3	Understand and apply the fundamentals of wave optics.
Environmental Science (C129)	CO1	Develop experimental skills on basic physics experiments.
	CO2	Overall understanding of the natural resources
	CO3	Basic understanding of the ecosystem and its diversity
	CO4	Acquaintance on various environmental challenges induced due to unplanned anthropogenic activities.
	CO5	An understanding of the environmental impact of developmental activities
	CO6	Awareness on the social issues and global treaties.



5. Course Outcomes of B. Tech. ECE Second Year – First Semester

Course Name with Code	CO No.	Course Outcome
Electronic Devices and Circuits (C211)	CO1	Illustrate PN junction characteristics from semiconductor materials.
	CO2	Compare the characteristics of rectifiers with and without filters.
	CO3	Summarize the characteristics of BJT in different configurations.
	CO4	Discuss the construction and operation of Field Effect Transistor characteristics and its applications
	CO5	Apply biasing methods for stabilization of BJT and FET amplifiers.
	CO6	Analyze small signal low frequency equivalent models of BJT and FET.
Switching Theory and Logic Design (C212)	CO1	Apply different digital number systems to generate various codes.
	CO2	Use the concept of Boolean algebra in minimization of switching functions
	CO3	Illustrate different types of combinational logic circuits with relevant ICs
	CO4	Compute the Boolean expressions using PLDs
	CO5	Apply knowledge of flip-flops in designing of Registers and counters
	CO6	Analyze clocked sequential circuits
Signals and Systems (C213)	CO1	Differentiate the various classifications of signals and systems
	CO2	Analyze the frequency domain representation of signals using Fourier concepts
	CO3	Classify the systems based on their properties and determine the response of LTI Systems
	CO4	Know the sampling process and various types of sampling techniques.
	CO5	Apply Laplace Transforms to analyze continuous time signals and Systems
	CO6	Apply Z-Transforms to analyze discrete time signals and Systems
Random Variables and Stochastic Processes (C214)	CO1	Solve the simple probabilistic problems and define the different distributions of random variables
	CO2	Explain the concept of single random variable and compute the statistical averages of the random variables
	CO3	Extend the probability models and different functions based on multiple random variables.
	CO4	Illustrate the random processes concept in the time domain.
	CO5	Illustrate the random processes concept in the frequency domain
	CO6	Analyze the LTI systems in the presence of different types of noise.
Object Oriented Programming through Java (C215)	CO1	Develop java programs using basic programming constructs in java, and able to use Control structures in the program development
	CO2	Experiment with Object Oriented Concepts like classes, objects.
	CO3	Apply and create programs using Object Oriented Constructs such as Inheritance, interfaces, and exception handling.
	CO4	Construct applications using code reusability and extend the code to enhance existing programs
	CO5	Design programs using object oriented construct and handle any time of run time errors
	CO6	Implement multithreading concepts in application development with database connectivity.
Managerial Economics & Financial Analysis (C216)	CO1	Enumerate the concepts of Economics, Demand and its Forecasting methods
	CO2	Understanding the relationship among inputs, output, nature of cost, cost combinations.
	CO3	State the nature of Markets, its structure, Price- Output decisions under different market structures & pricing strategies
	CO4	Identify various types of organizations and their characteristics based on ownership
	CO5	Illustrate financial statements by using various accounting tools
	CO6	Discuss various methods to select a financial proposal by using capital budgeting methods
Electronic Devices and Circuits Lab (C217)	CO1	Experiment and characterize the two terminal devices.
	CO2	Construct a Rectifier circuit with and without filter
	CO3	Examine the characteristics of BJT and FET
	CO4	Demonstrate the operation of CRO
	CO5	Experiment and characterize the UJT.
	CO6	Analyse the frequency response characteristics of BJT and FET
Switching Theory and Logic Design Lab (C218)	CO1	Test the operation of different logic gates using relevant IC's.
	CO2	Examine the operation of different combinational logic circuits.
	CO3	Apply the concept of Boolean algebra or k-maps to reduce and Construct logic circuit for given function.
	CO4	Analyse the Truth tables of different Flip-Flops.
	CO5	Design of registers using sequential logic circuits.
	CO6	Design of Synchronous and Asynchronous counters using Flip-Flops.
Constitution of India (C219)	CO1	To Enable the student to understand the importance of constitution
	CO2	To understand the structure of executive, legislature and judiciary
	CO3	To understand philosophy of fundamental rights and duties
	CO4	To understand the autonomous nature of constitutional bodies like Supreme Court and high court controller and auditor general of India
	CO5	To understand the election commission of India
	CO6	To understand the central and state relation financial and administrative



6. Course Outcomes of B. Tech. ECE Second Year – Second Semester

Course Name with Code	CO No.	Course Outcome
Electronic Circuit Analysis (C221)	CO1	Construct small signal high frequency transistor amplifiers.
	CO2	Compare single and multi-stage amplifiers.
	CO3	Analyze different voltage and current feedback amplifiers.
	CO4	Design RC and LC oscillators as per the given specifications.
	CO5	Summarize the performance metrics of power amplifiers.
	CO6	Select the appropriate tuned amplifier circuit to build a given application.
Linear Control Systems (C222)	CO1	Understand the concepts of linear control system and to obtain the overall transfer function
	CO2	Analyze the system stability by Routh Hurwitz's techniques
	CO3	Analyze the time domain response of first order and second order system with different test signals
	CO4	Analyze the system stability by Root Locus techniques
	CO5	Sketch and test the system's stability with Polar plots, Bode plots and Nyquist plots.
	CO6	Understand the concepts of state variable analysis and to design the different control systems
Electromagnetic Waves and Transmission Lines (C223)	CO1	Construct transmission line equation and expressions for primary & secondary constants
	CO2	Calculate the expressions for input impedance, reflection coefficient, VSWR of transmission lines, Impedance transformation & matching and applications of smith chart
	CO3	Determine E & H using various laws and applications of electric fields
	CO4	Apply the Maxwell equations to analyze the time varying behavior of EM waves
	CO5	Employ the knowledge of uniform plane wave concept and characteristics of uniform plane wave in various media
	CO6	Demonstrate the expressions for the reflection & refraction of plane waves in perfect conductor & dielectric medium and power analysis.
Analog Communications (C224)	CO1	Building blocks in analog communication systems and basic understanding of Amplitude Modulation and Demodulation.
	CO2	Time and frequency domain analysis of DSB-SC and SSB-SC and their generation and detection schemes.
	CO3	Classification of angle modulation and detailed analysis of modulation and demodulation schemes in FM.
	CO4	Classifications of radio transmitters and receivers.
	CO5	Noise analysis of analog modulation systems.
	CO6	Comparison of various pulse modulation techniques and also between FDM and TDM techniques.
Computer Architecture and Organization (C225)	CO1	Can interpret the functional components of a computer and their operations.
	CO2	To determine effective address of an operand using the addressing modes.
	CO3	Can analyze the type of instructions.
	CO4	To examine various bus configurations and their applications
	CO5	List various types of memory systems
	CO6	Explain the operations inside the processing unit
Management and Organizational Behavior (C226)	CO1	Explain various concepts of management, principles, leadership styles and basic concepts on Organization
	CO2	Discuss conceptual knowledge on functional management that is on Human resource management and Marketing management
	CO3	Explain the basic Concepts into select contemporary management practices and Strategic Management
	CO4	Discuss the theories of motivation and also deals with individual behavior, their personality and perception of individuals
	CO5	Understand about organizations groups that affect the organizational climate
	CO6	Analyze entire organizations which helps employees in stress management
Electronic Circuit Analysis Lab (C227)	CO1	Calculate bandwidth of given two stage RC coupled amplifier
	CO2	Compare different types of Feedback amplifiers according to their input and output impedances.
	CO3	Classify different types of Oscillator circuits.
	CO4	Demonstrate different Power amplifier - Class A, Class B
	CO5	Analyze the response of the tuned amplifier.
	CO6	Simulate different types of Amplifiers and Oscillator circuits using software tool.
Analog Communications Lab (C228)	CO1	Understand different analog modulation and demodulation scheme and analysis of signals on Spectrum Analyzer.
	CO2	Detailed analysis of diode detector.
	CO3	Understand different frequency modulation and demodulation schemes. Extend the analysis of FM with Pre-emphasis & De-emphasis circuits.
	CO4	Prove Sampling Theorem.
	CO5	Understand the basics of different pulse modulation and demodulation schemes.
	CO6	Evaluate the performance of various components like AGC that improve radio receiver's performance.



7. Course Outcomes of B. Tech. ECE Third Year – First Semester

Course Name with Code	CO No.	Course Outcome
Computer Architecture and Organization (C311)	CO1	Students can interpret the functional components of a computer and their operations.
	CO2	They can compute effective address of an operand using the addressing modes.
	CO3	Students can analyze the type of instructions.
	CO4	They can explain bus system and I/O organization.
	CO5	Students can characterize the Basic memory circuits and secondary storage devices.
	CO6	They can illustrate fundamental operations of the processing unit and Micro programmed Control.
Linear IC Applications (C312)	CO1	Explain the basic operation and performance parameters of differential amplifiers
	CO2	Discuss the internal operation of Op-Amp and its Parameters
	CO3	Analyze different linear and non-linear applications using Op-Amp
	CO4	Analyze active filters using Op-Amp
	CO5	Analyze the 555 Timers and Phase Locked Loop
	CO6	Discuss the concepts of different types of D-A & A-D Converters
Digital IC Applications (C313)	CO1	Compare different digital logic families.
	CO2	Demonstrate syntax of VHSIC Hardware Description Language.
	CO3	Categorize the different levels of abstraction.
	CO4	Model a combinational logic circuit at various levels of abstractions.
	CO5	Develop a code for the sequential logic circuit at various levels of abstraction.
	CO6	Analyze synchronous and asynchronous sequential circuits using VHDL.
Digital Communications (C314)	CO1	Explain the process of encoding and decoding of analog signals.
	CO2	Explain various line coding & digital modulation techniques
	CO3	Evaluate the probability of error for various digital modulation schemes
	CO4	Predict the average and mutual information of discrete messages
	CO5	Distinguish the data compression techniques in source coding
	CO6	Demonstrate different error detection & correction coding schemes for reliable transmission
Antenna and Wave Propagation (C315)	CO1	Describe how antenna converts the electrical energy to electromagnetic wave and vice versa
	CO2	Define the concepts of retarded potential, near field, far field & able to calculate the radiation of wired antennas
	CO3	Demonstrate the types of arrays and capable to characterize simple arrays based on their applications
	CO4	Apply the concepts of resonant and non resonant antennas for practical applications
	CO5	Apply the concepts simple VHF and UHF antennas
	CO6	Describe various types of propagation and terrestrial effects on radiowave
Pulse and Digital Circuits Lab (C316)	CO1	Design various linear & non-linear circuits and analyze their response.
	CO2	Study the characteristics of transistors
	CO3	Design of non-sinusoidal oscillators
	CO4	Analyzing various types of non-sinusoidal waveforms using multi vibrators.
	CO5	Design current and voltage sweep circuits based on given specifications.
	CO6	Study of various digital logic circuits.
Linear IC Applications Lab (C317)	CO1	Describe the Functioning, Parameters and Specifications of IC 741, IC 555, IC 565, IC 566, IC 1496
	CO2	Analyze and Construct Op-Amp circuits for linear applications with the given specifications.
	CO3	Analyze and Construct Op-Amp circuits for Non-linear applications with the given specifications.
	CO4	Analyze and Design various types of active filters using Op-Amp
	CO5	Experiment monostable and astable circuits using IC555 Timer, Construct PLL using 565
	CO6	Examine different types of regulators using op-amp.
Digital IC Applications Lab (C318)	CO1	Interpret the functionality of logic gates and full adder circuit using HDL simulator.
	CO2	Synthesize, simulate and implement Decoder – encoder circuit using HDL simulator
	CO3	Synthesize, simulate and implement Mux-Demux & 4-bit comparator circuit using HDL simulator
	CO4	Synthesize, simulate and implement Sequential Circuits using HDL simulator
	CO5	Synthesize & simulate MAC circuit using HDL simulator
	CO6	Analyze ALU Design using HDL simulator
Professional Ethics & Human Values (C319)	CO1	Understand about morals, values ,work ethics, learn to respect others and develop civic virtue
	CO2	Discuss about Customs and Traditions and human rights and value.
	CO3	Demonstrate knowledge to become a social experimenter.
	CO4	Understand about the ethical responsibilities of the engineers.
	CO5	Demonstrate the duties of an Engineers
	CO6	Develop knowledge about global issues.



8. Course Outcomes of B. Tech. ECE Third Year – Second Semester

Course Name with Code	CO No.	Course Outcome
Micro Processors & Micro Controllers (C321)	CO1	Explain the Architecture of 8086 Microprocessor with Timing diagrams and interrupts.
	CO2	Develop Programming skills in assembly language for 8086 Microprocessor
	CO3	Design the interfacing techniques of various peripherals to Microprocessor.
	CO4	Distinguish the key features of advanced processors and Pentium processors.
	CO5	Explain the features of 8051 Microcontroller, its instruction set, addressing modes and programming of 8051.
	CO6	Learn concept of PIC controller.
Micro Wave Engineering (C322)	CO1	Analyze the mode characteristics and propagation of microwave signals.
	CO2	Determine the various parameters and characteristics of circular waveguides and cavity resonators.
	CO3	Compare the difference between the conventional tubes and the microwave tubes for the transmission of the microwaves.
	CO4	Classify O-type and M-type tube devices
	CO5	Analyze S-matrix for various waveguide components
	CO6	Compare Microwave tubes and Solid State Devices.
VLSI Design (C323)	CO1	Explain the fabrication process of various MOS technologies and electrical behavior of MOS circuits related problems
	CO2	Apply the concept of Design rules for stick diagrams and Layouts
	CO3	Discuss the scaling and delays of MOS circuits
	CO4	Analyze the testable design techniques and design quality of the chip
	CO5	Describe the architectures of FPGA families
	CO6	Classify various performance issues in low power VLSI circuits
Digital Signal Processing (C324)	CO1	Summarize the concepts of Signals and Z- Transforms
	CO2	Apply DFT for the analysis of Digital signals
	CO3	Design IIR Filters
	CO4	Develop FIR Filters
	CO5	Extend the concept of signal processing to multi rate signal processing
	CO6	Explain Digital Signal Processors
Bio-Medical Engineering (C325)	CO1	Explain the fundamentals of Biomedical Engineering, Man- Instrument methodology and different waveforms generation.
	CO2	Analyze the different types of bioelectric potentials taking from the body using different types of electrodes and transducers.
	CO3	Describe the cardiovascular, respiratory system with instruments used for measurement
	CO4	Analyze different Monitors, Recorders, Prosthetic Instruments
	CO5	Identify different instruments used in assist therapy given to human body.
	CO6	Discuss causes for shock hazards and methods of prevention in hospitals.
Micro Processors & Micro Controllers Lab (C326)	CO1	Write a program on a microprocessor using instruction set of 8086
	CO2	Summarize the concepts of 8086 assembly level language programming and its applications
	CO3	Contrast how input output devices can be interfaced to processor and will explore several techniques of interfacing
	CO4	Write a program on a 8051 microcontroller using instruction set of 8051
	CO5	Summarize the concepts of 8051 assembly level language programming and its applications
	CO6	Contrast how input output devices can be interfaced to microcontroller and will explore several techniques of interfacing
VLSI Lab (C327)	CO1	Design inverter and universal gates at transistor level using Pyxis schematic and perform transient analysis and evaluate performance metrics.
	CO2	Design adder and subtractor circuits using Pyxis schematic and perform transient analysis and evaluate performance metrics.
	CO3	Design various Decoders and evaluate their performance metrics using Mentor Graphics EDA tools with 130nm technology
	CO4	Design various sequential circuits and evaluate their performance metrics using Mentor Graphics EDA tools with 130nm technology
	CO5	Implement S-Ram cell using CMOS 130nm Technology with Mentor Graphics EDA tool
	CO6	Design Digital to Analog converter and evaluate their performance metrics (power, delay) using Mentor Graphics EDA tools with 130nm technology



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Digital Communications Lab (C328)	CO1	Estimate the performance of base band signals.
	CO2	Explain the process of encoding and decoding of analog signals.
	CO3	Analyze different digital modulation techniques in digital communications
	CO4	Apply companding technique in digital communication system.
	CO5	Apply various channel coding schemes & demonstrate their capabilities towards the improvement of the noise performance system.
	CO6	Analyze different techniques in modern digital communications, in particular error detection and correction techniques.
IPR & Patents (C329)	CO1	Identify different types of Intellectual Properties (IPs), the right of ownership, scope of protection as well as the ways to create and to extract value from IP.
	CO2	Recognize the crucial role of IP in organizations of different industrial sectors for the purposes of product and technology development.
	CO3	Identify activities and constitute IP infringements and the remedies available to the IP owner and describe the precautions steps to be taken to prevent infringement of proprietary rights in products and technology development.
	CO4	Be familiar with the processes of Intellectual Property Management (IPM) and various approaches for IPM and conducting IP and IPM auditing and explain how IP can be managed as a strategic resource and suggest IPM strategy.
	CO5	Be able to anticipate and subject to critical analysis arguments relating to the development and reform of intellectual property right institutions and their likely impact on creativity and innovation.
	CO6	Be able to demonstrate a capacity to identify, apply and assess ownership rights and marketing protection under intellectual property law as applicable to information, ideas, new products and product marketing.



9. Course Outcomes of B. Tech. ECE Fourth Year – First Semester

Course Name with Code	CO No.	Course Outcome
Radar Systems (C411)	CO1	Explain the basic principle of RADAR System and calculate different parameters of radar system using radar equation.
	CO2	Analyze the working principle of CW and Frequency Modulated Radar
	CO3	Analyze the principle of each block of MTI and Pulse Doppler Radar.
	CO4	Demonstrate the block diagram Tracking Radar
	CO5	Compute the characteristics of matched filter & receiver performance.
	CO6	Discuss the importance of duplexers, display units & design antennas
Digital Image Processing (C412)	CO1	Summarize the basics of image formation and various transforms used in image processing.
	CO2	Apply spatial and frequency domain filters to enhance an image.
	CO3	Evaluate image restoration operations/techniques on images.
	CO4	Demonstrate Image compression and wavelet-based image processing.
	CO5	Categorize various segmentation techniques and morphological algorithms in image processing.
	CO6	Illustrate various color models, full and pseudo color image processing.
Computer Networks (C413)	CO1	Identify various layers of network and discuss the functions of physical layer
	CO2	Discuss Fundamental Concepts Of Physical Layer
	CO3	Discuss how data flows from one node to another node with regard to data link layer
	CO4	Discuss various MAC Layer protocols
	CO5	Explain the different services of network layer and Various Routing Algorithms
	CO6	Demonstrate Transport Layer and Application Layer Protocols
Optical Communications (C414)	CO1	Illustrate basic functionality parameters of optical fiber communication system
	CO2	Explain various glass fiber materials to minimize the fiber losses
	CO3	Categorize different optical fiber connectors and splicing techniques used to join optical cables
	CO4	Determine different optical sources and detectors used in fiber materials
	CO5	Estimate the power calculations and efficiencies between source to fiber devices
	CO6	Determine the losses in optical links using rise time budget and link loss budget analysis
Electronic Switching Systems (C415)	CO1	Explain the main concepts of telecommunications & switching systems
	CO2	Compare space division switching processes and network stages
	CO3	Evaluate time & space parameters and methods to interconnect sperate digital switches.
	CO4	Demonstrate telephone network for routing data and signaling techniques
	CO5	Estimate the traffic handling capacity of the telephone switching system.
	CO6	Compare telephone network, data network & integrated service digital network
Embedded Systems (C416)	CO1	Understand basic concept of embedded systems and the applications in various processors and domains of embedded system.
	CO2	Analyze the different hardware components and embedded hardware development cycles and tools.
	CO3	Analyze the different software tools and embedded software development cycles.
	CO4	Analyze to understand the concepts of RTOS and what is a microcomputer and Computational models of embedded system.
	CO5	Remember the different types of debugging techniques and tools of embedded systems.
	CO6	Analyze to understand the differences between IDE tools, host and target machines.
Micro Wave Engineering & Optical Lab (C417)	CO1	Demonstrate the characteristics of wave guide components
	CO2	Analyze the characteristics of Reflex klystron and Gunn diode.
	CO3	Measure Attenuation, Frequency, impedance and VSWR of micro wave guides
	CO4	Determine the Characteristics of various antennas and scattering parameters of circulator and magic tee.
	CO5	Demonstrate the Characteristics of analog and digital link transmission and the losses present in optical fiber using LED and LASER
	CO6	Determine the Numerical Aperture of an optical fiber
Digital Signal Processing Lab (C418)	CO1	Illustrate continuous and discrete basic signals and addition of sinusoidal signals.
	CO2	Develop program for Linear and Circular convolution using MATLAB and Code composer studio.
	CO3	Analyse stability using different transformation techniques.
	CO4	Infer frequency responses of IIR and FIR Filters .
	CO5	Apply basic image processing techniques.
	CO6	Compute PSNR and MSE for filtering techniques and. Transformation techniques.



10. Course Outcomes of B. Tech. ECE Fourth Year – Second Semester

Course Name with Code	CO No.	Course Outcome
Cellular Mobile Communications (C421)	CO1	Illustrate the operation of cellular systems with basic elements
	CO2	Outline the wireless channels impairments such as fading, interference and coverage
	CO3	Categorize the cell site and mobile antennas to minimize the interference
	CO4	Infer the channel assignment strategies to combat against interference
	CO5	Examine the dropped call rates under handoff
	CO6	Organize the GSM architecture into individual blocks and GSM channels
Electronic Measurements and Instrumentation (C422)	CO1	Discuss fundamental characteristics of different instruments
	CO2	Assess different signal generators and analyzers in terms of their performance.
	CO3	Use different oscilloscopes in various applications
	CO4	Describe working of various AC bridges
	CO5	Analyze several electrical parameters of transducers
	CO6	Derive various physical parameters of the transducers
Satellite Communications (C423)	CO1	Determine the orbital mechanics, look angle and orbital effects in satellite communication systems performance.
	CO2	Ability to develop commands, monitoring power systems and development of antennas
	CO3	Construct the expression for G/T ratio and to solve some analytical problems on satellite link design
	CO4	Classify the various types of multiple access techniques and architecture of earth station design
	CO5	Describe the concept of low earth orbit & geo-stationary satellite systems
	CO6	Demonstrate the impacts of GPS, NGSO constellation for design for tracking & launching
Wireless sensors & Networks (C424)	CO1	Explain the Fundamental Concepts and applications of wireless sensor networks
	CO2	Analyze the Networking Technologies for wireless sensor networks
	CO3	Discuss the MAC protocol issues of ad hoc wireless sensor networks
	CO4	Compare routing protocols for ad hoc wireless networks with respect to their classifications
	CO5	Illustrate Transport layer protocols for ad hoc wireless networks with respect to TCP design issues
	CO6	Discuss the security, sensor network platforms issues and applications of wireless sensor networks
Seminar (C425)	CO1	Spell for basic concepts of science and technology
	CO2	Contrast the understanding perceptive of techniques applicable to their domain
	CO3	Construct the solutions upon their own knowledge.
	CO4	Improve their Presentation and Communication skills.
	CO5	Make up them to pursue their placements and higher studies.
	CO6	Explain the completed task with seminar report.
Project (C426)	CO1	Identify the problem by applying acquired knowledge.
	CO2	Use literature to identify the objective, scope and the concept of the work.
	CO3	Analyze and categorize executable project modules after considering risks.
	CO4	Choose efficient tools for designing project modules.
	CO5	Integrate all the modules through effective team work after efficient testing.
	CO6	Explain the completed task and compile the project report.