



VAAGDEVICOLLEGE OF ENGINEERING

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Bollikunta, Khila Warangal (Mandal), Warangal Urban-506005 (T.S), www.vaagdevi.edu.in

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

Course Outcomes for B.Tech–ECE (R22) for the academic year 2022-2023 onwards

Course Outcome	Year/Semester I Year/ I Sem	Subject Name (Subject Code) Matrices And Calculus(B22MA01)	No. of Hours L:3 T:1P:0	Credits:4
After the completion of this course, the students should be able to				
1	Write the matrix representation of a set of linear equations and to analyze the solution of the system equations.			
2	Find the Eigen values and Eigen vectors. Reduce the quadratic form to canonical form using orthogonal transformations.			
3	Solve the applications on the mean value theorems.			
4	Evaluate the improper integrals using Beta and Gamma functions.			
5	Find the extreme values of functions of two variables with/ without constraints. Evaluate the multiple integrals and apply the concept to find areas, volumes			
Course Outcome	Year/Semester I Year/ I Sem	Subject Name (Subject Code) Applied Physics (B22PH01)	No. of Hours L:3 T:1P:0	Credits:4
After the completion of this course, the students should be able to				
1	Understand physical world from fundamental point of view by the concepts of Quantum Mechanics and visualize the difference between conductor, semiconductor, and an insulator by classification of solids.			
2	Identify the role of semiconductor devices in science and engineering Applications.			
3	Explore the fundamental properties of dielectric, magnetic materials and energy for their applications.			
4	Appreciate the features and applications of Nanomaterials.			
5	Understand various aspects of Lasers and Optical fibre and their applications in diverse fields.			
Course Outcome	Year/Semester I Year/ I Sem	Subject Name (Subject Code) C Programming for Engineers (B22CS08)	No. of Hours L:3 T:0P:0	Credits:3
After the completion of this course, the students should be able to				
1	Draw flowcharts for solving arithmetic and logical problems			
2	Explore the concepts of control statements in C Programming			
3	Develop modular reusable code by understanding the concepts of functions.			
4	Understand the concepts of pointers and files.			
5	Analyze various searching and sorting algorithms.			
Course Outcome	Year/Semester I Year/ I Sem	Subject Name (Subject Code) Engineering Workshop(B22ME01)	No. of Hours L:0 T:1P:3	Credits:2.5
After the completion of this course, the students should be able to				
1	Study and practice on machine tools and their operations.			
2	Practice on manufacturing of components using workshop trades including plumbing fitting, Carpentry, foundry, house wiring and welding.			
3	Identify and apply suitable tools for different trades of Engineering processes including drilling, material removing, measuring, chiselling.			
4	Apply basic electrical engineering knowledge for house wiring practice.			
Course Outcome	Year/Semester I Year/ I Sem	Subject Name (Subject Code) English for Skill Enhancement (B22EN01)	No. of Hours L:2 T:0P:0	Credits:2
After the completion of this course, the students should be able to				
1	Understand the importance of vocabulary and sentence structures.			
2	Choose appropriate vocabulary and sentence structures for their oral and written communication.			



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3	Demonstrate their understanding of the rules of functional grammar.			
4	Develop comprehension skills using known and unknown passages.			
5	Take an active part in drafting paragraphs, letters, essays, abstracts, précis and reports in various contexts			
Course Outcome	Year/Semester I Year/ I Sem	Subject Name (Subject Code) Elements of Electronics and Communication Engineering (B22EC01)	No. of Hours L:0 T:0P:2	Credits:1
After the completion of this course, the students should be able to				
1	Identify the different components used for electronics applications.			
2	Measure different parameters using various measuring instruments.			
3	Distinguish various signal used for analog and digital communications.			
4	Know the software's to be used in Electronics and communication and engineering			
Course Outcome	Year/Semester I Year/ I Sem	Subject Name (Subject Code) Applied Physics Laboratory (B22PH02)	No. of Hours L:0 T:0P:3	Credits:1.5
After the completion of this course, the students should be able to				
1	Know the determination of the Planck's constant using Photo electric effect and time constant of RC circuit experiment.			
2	Appreciate quantum physics in semiconductor devices and optoelectronics.			
3	Gain the knowledge about frequency of AC power supply.			
4	Understand the variation of magnetic field and behaviour of hysteresis curve.			
5	Able to measure the time Constant of RC Circuit			
Course Outcome	Year/Semester I Year/ I Sem	Subject Name (Subject Code) English Language and Communication Skills Laboratory (B22EN02)	No. of Hours L:0 T:0P:2	Credits:1
After the completion of this course, the students should be able to				
1	Understand the nuances of English language through audio- visual experience and group activities.			
2	Neutralize their accent for intelligibility.			
3	Develop their listening skills so that they may appreciate its role in developing LSRW skills of language and improve their pronunciation.			
4	Involve in speaking activities in various contexts.			
5	Speak with clarity and confidence which in turn enhance their employability skills.			
Course Outcome	Year/Semester I Year/ I Sem	Subject Name (Subject Code) C Programming for Engineers Laboratory (B22CS09)	No. of Hours L:0 T:0P:2	Credits:1
1	Write algorithms and to draw flowcharts for solving problems and translate the algorithms/flow charts to programs (in C language).			
2	Use functions to develop modular reusable code.			
3	Use arrays, pointers, strings and structures to formulate algorithms and programs.			
4	Understand Searching and sorting algorithms			
Course Outcome	Year/Semester I Year/ I Sem	Subject Name (Subject Code) Environmental Science (B22CH03)	No. of Hours L:3 T:0P:0	Credits:0
After the completion of this course, the students should be able to				
1	Based on this course, the Engineering graduate will understand /evaluate / develop technologies on the basis of ecological principles and environmental regulations which in turn helps in sustainable development			
Course Outcome	Year/Semester I Year/ II Sem	Subject Name (Subject Code) Ordinary Differential Equations and	No. of Hours L:3 T:1P:0	Credits:4



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		Vector Calculus(B22MA02)		
After the completion of this course, the students should be able to				
1	Identify whether the given differential equation of first order is exact or not			
2	Solve higher differential equation and apply the concept of differential equation to real world problems.			
3	Extend the basic concepts of differential calculus to vector functions in a simple and natural fashion.			
4	Extend the basic concepts of differential calculus to vector functions in a simple and natural fashion.			
5	Evaluate the line, surface and volume integrals and converting them from one to another			
Course Outcome	Year/Semester I Year/ II Sem	Subject Name (Subject Code) Engineering Chemistry(B22CH01)	No. of Hours L:3 T:1P:0	Credits:4
After the completion of this course, the students should be able to				
1	Students will acquire the basic knowledge of electrochemical procedures related to corrosion and its control.			
2	The students are able to understand the basic properties of water and its usage in domestic and industrial purposes.			
3	They can learn the fundamentals and general properties of polymers and other engineering materials.			
4	They can predict potential applications of chemistry and practical utility in order to become good engineers and entrepreneurs.			
Course Outcome	Year/Semester I Year/ II Sem	Subject Name (Subject Code) Computer Aided Engineering Graphics (B22ME03)	No. of Hours L:1 T:0P:4	Credits:3
After the completion of this course, the students should be able to				
1	Apply computer aided drafting tools to create 2D and 3D objects sketch conics and different types of solids			
2	Appreciate the need of Sectional views of solids and Development of surfaces of solids			
3	Read and interpret engineering drawings			
4	Conversion of orthographic projection into isometric view and vice versa manually and by using computer aided drafting			
Course Outcome	Year/Semester I Year/ II Sem	Subject Name (Subject Code) Basic Electrical Engineering(B22EE03)	No. of Hours L:2 T:0P:0	Credits:2
After the completion of this course, the students should be able to				
1	Analyze circuit theorems, mesh and nodal analysis, series and parallel networks, Electrical power			
2	Gain knowledge on AC circuits, reactance, Impedance, Susceptance and Admittance and Power Factor			
3	Learn the working principle of DC motors, Transformers			
4	Understand the construction and performance characteristics of Electrical Machines			
5	Introduce components of Low Voltage Electrical Installations			
Course Outcome	Year/Semester I Year/ II Sem	Subject Name (Subject Code) Electronic Devices and Circuits(B22EC02)	No. of Hours L:2 T:0P:0	Credits:2
After the completion of this course, the students should be able to				
1	Acquire the knowledge of PN diode and its characteristics.			
2	Design the rectifiers with and without filters for specified DC voltage.			
3	Illustrate the voltage- current characteristics of Junction Transistor and different configurations of transistor			
4	Acquire knowledge about the construction, theory and characteristics of FET and MOSFET			
5	Acquire the knowledge about the role of special purpose devices and their applications			
Course Outcome	Year/Semester I Year/ II Sem	Subject Name (Subject Code) Applied Python Programming Laboratory(B22CS10)	No. of Hours L:0 T:1P:2	Credits:2



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After the completion of this course, the students should be able to				
1	Install Python in Linux and windows, Installing OS on Raspberry Pi			
2	Build basic programs using fundamental programming constructs			
3	Write and execute python codes for different applications			
4	Capable to implement on hard ware boards			
Course Outcome	Year/Semester I Year/ II Sem	Subject Name (Subject Code) Engineering Chemistry Laboratory(B22CH02)	No. of Hours L:0 T:0P:2	Credits:1
After the completion of this course, the students should be able to				
1	Able to determine the hardness of water			
2	Able to perform methods such as conductometry, and potentiometry in order to find out the concentrations or equivalence points of acid, and P ^H of unknown solutions..			
3	Students are able to prepare polymers like Bakelite and nylon-6,6.			
4	Estimations saponification value and viscosity of lubricant oils			
Course Outcome	Year/Semester I Year/ II Sem	Subject Name (Subject Code) Basic Electrical Engineering Laboratory(B22EE04)	No. of Hours L:0 T:0P:2	Credits:1
After the completion of this course, the students should be able to				
1	Verify the basic electrical circuits through different laws and theorems			
2	Analyze the transient responses of R, L and C circuits for DC excitation			
3	Create resonance condition in series R-L-C circuit			
4	Analyze the performance of DC shunt motor, single phase transformer and three Phase Induction Motor			
Course Outcome	Year/Semester I Year/ II Sem	Subject Name (Subject Code)) Electronic Devices and Circuits Laboratory(B22EC03)	No. of Hours L:0 T:0P:2	Credits:1
After the completion of this course, the students should be able to				
1	Acquire the knowledge of various semiconductor devices and their use in real life.			
2	Design aspects of biasing and keep them in active region of the device for Functional circuits			
3	Acquire the knowledge about the role of special purpose devices and their applications.			
4	Design simple electronic circuits			
Course Outcome	Year/Semester II Year/ I Sem	Subject Name (Subject Code) Numerical Methods and Complex Variables (B22MA07)	No. of Hours L:3 T:1P:0	Credits:4
After the completion of this course, the students should be able to				
1	Express any periodic function in terms of sine and cosine			
2	Find the root of a given polynomial and transcendental equations.			
3	Estimate the value for the given data using interpolation			
4	Find the numerical solutions for a given first order ODE's			
5	Analyze the complex function with reference to their analyticity, integration using Cauchy's integral and residue theorems			
6	Taylor's and Laurent's series expansions in complex function			
Course Outcome	Year/Semester II Year/ I Sem	Subject Name (Subject Code) Analog Circuits(B22EC04)	No. of Hours L:3 T:0P:0	Credits:3
After the completion of this course, the students should be able to				
1	Design the amplifiers with various biasing techniques.			
2	Design single stage amplifiers using BJT and FET			
3	Design multistage amplifiers and understand the concepts of High Frequency Analysis of BJT.			
4	Utilize the Concept of negative feedback to improve the characteristics of amplifiers.			
5	Utilize the concept of Barkhausen criterion to design various oscillators			



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Course Outcome	Year/Semester II Year/ I Sem	Subject Name (Subject Code) Network analysis and Synthesis(B22EE12)	No. of Hours L:3 T:0P:0	Credits:3
After the completion of this course, the students should be able to				
1	Gain the knowledge on basic RLC circuits behavior.			
2	Analyze the Steady state and transient analysis of RLC Circuits.			
3	Characterization of two port network parameters.			
4	Analyze the Design aspect of various filters and attenuators			
Course Outcome	Year/Semester II Year/ I Sem	Subject Name (Subject Code) Digital Logic Design(B22EC05)	No. of Hours L:3 T:0P:0	Credits:3
After the completion of this course, the students should be able to				
1	Acquire the knowledge on numerical information in different forms and Boolean Algebra theorems for Combinational function minimization			
2	Design logic circuits by applying minimization techniques and also able to characterize the various logic families for their AC and DC parameter's			
3	Design and analyze various combination logic circuits and understand the fundamental's of sequential circuits			
4	Design and analyze sequential circuits for various cyclic functions			
5	Acquire the knowledge on concepts of FSM and ASM charts			
Course Outcome	Year/Semester II Year/ I Sem	Subject Name (Subject Code) Signals and Systems(B22EC06)	No. of Hours L:3 T:1P:0	Credits:4
After the completion of this course, the students should be able to				
1	Apply the knowledge of various signals, and systems.			
2	Analyze the transform techniques in time and frequency domain.			
3	Identify the conditions for transmission of signals through systems and conditions for physical realization of systems.			
4	Analyze the concept of Region of Convergence for different Transformation techniques.			
5	Use sampling theorem for baseband and band pass signals for various types of sampling and apply the correlation and PSD functions for various applications			
Course Outcome	Year/Semester II Year/ I Sem	Subject Name (Subject Code) Analog Circuits Laboratory(B22EC07)	No. of Hours L:0 T:0P:2	Credits:1
After the completion of this course, the students should be able to				
1	Design amplifiers with required Q point and analyze amplifier characteristics			
2	Examine the effect multistage amplification on frequency response			
3	Investigate various feedback topologies and their frequency responses.			
4	Design various oscillator circuits.			
Course Outcome	Year/Semester II Year/ I Sem	Subject Name (Subject Code) Digital logic Design Laboratory(B22EC08)	No. of Hours L:0 T:0P:2	Credits:1
After the completion of this course, the students should be able to				
1	Acquire the knowledge on numerical information in different forms and Boolean algebra theorems.			
2	Define Postulates of Boolean algebra and to minimize combinational functions, and design the combinational circuits.			
3	Design and analyze sequential circuits for various cyclic functions.			
4	Characterize logic families and analyze them for the purpose of AC and DC parameters			
Course Outcome	Year/Semester II Year/ I Sem	Subject Name (Subject Code) Basic Simulation Laboratory(B22EC09)	No. of Hours L:0 T:0P:2	Credits:1
After the completion of this course, the students should be able to				
1	Generate, analyze and perform various operations on Signals/Sequences both in time and Frequency			



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2	Analyze and Characterize Continuous and Discrete Time Systems both in Time and Frequency domain along with the concept of Sampling			
3	Generate different Random Signals and capable to analyze their Characteristics			
4	Apply the Concepts of Deterministic and Random Signals for Noise removal Applications and on other Real Time Signals			
Course Outcome	Year/Semester II Year/ I Sem	Subject Name (Subject Code) Logical Reasoning & Quantitative Aptitude (B22MC08)	No. of Hours L:3 T:0P:0	Credits:0
After the completion of this course, the students should be able to				
1	Improve their logical thinking in terms of general and mathematical concepts.			
2	Compete in academic as well as competitive levels through which students are able to solve the real world problems.			
3	Analyze the number systems			
4	Make quick decisions to face the critical arithmetic problems.			
5	Analyze the mathematical problems			
Course Outcome	Year/Semester II Year/ II Sem	Subject Name (Subject Code) Probability Theory and Stochastic Processes (B22EC13)	No. of Hours L:3 T:0P:0	Credits:3
After the completion of this course, the students should be able to				
1	Understand the concepts of Probability, random variables, density and distribution functions			
2	Perform operations on single and multiple Random variables.			
3	Determine the temporal characteristics of Random Signals.			
4	Understand the concepts of spectral characteristics of Random processes and Characterize LTI systems driven by stationary random process by using ACFs and PSDs.			
5	Understand the concepts of Noise and Information theory in Communication systems			
Course Outcome	Year/Semester II Year/ II Sem	Subject Name (Subject Code) Electromagnetic Fields and Transmission Lines (B22EC14)	No. of Hours L:3 T:0P:0	Credits:3
After the completion of this course, the students should be able to				
1	Acquire the knowledge of Basic Laws, Concept and proofs related to Electrostatic Fields			
2	Acquire the knowledge of Basic Laws related to Magneto static Fields..			
3	Characterize the static and time-varying fields; establish the corresponding sets of Maxwell's Equations and Boundary Conditions.			
4	Analyze the Wave Equations and classify conductors, dielectrics and evaluate the UPW Characteristics for several practical media of interest.			
5	Analyze the Design aspect of transmission line parameters and configurations			
Course Outcome	Year/Semester II Year/ II Sem	Subject Name (Subject Code) Analog and Digital Communications (B22EC15)	No. of Hours L:3 T:0P:0	Credits:3
After the completion of this course, the students should be able to				
1	Design and analyze various Amplitude Modulation and Demodulation techniques.			
2	Interpret different angle modulation and demodulation systems.			
3	Assess the performance of various transmitters and receivers.			
4	Analyze various pulse modulation and demodulation techniques.			
5	Develop skills in analyzing digital modulation schemes			
Course Outcome	Year/Semester II Year/ II Sem	Subject Name (Subject Code) Linear and Digital IC Applications (B22EC16)	No. of Hours L:3 T:0P:0	Credits:3
After the completion of this course, the students should be able to				
1	A thorough understanding of operational amplifiers with linear integrated circuits.			
2	Attain the knowledge of functional diagrams and design applications of IC555 and IC565.			
3	Acquire the knowledge and design the Data converters.			



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4	Choose the proper digital integrated circuits by knowing their characteristics.			
5	Attain the knowledge about 74xx and CMOS 40xx series integrated circuits for sequential logic			
Course Outcome	Year/Semester II Year/ II Sem	Subject Name (Subject Code) Electronic Circuit Analysis(B22EC17)	No. of Hours L:3 T:0P:0	Credits:3
After the completion of this course, the students should be able to				
1	Design the power amplifiers			
2	Design the tuned amplifiers and analyze its frequency response			
3	Design Multivibrators for various applications.			
4	Analyze different sweep generator circuits.			
5	Utilize the concepts of synchronization, frequency division and sampling gates			
Course Outcome	Year/Semester II Year/ II Sem	Subject Name (Subject Code) Analog and Digital Communications Laboratory(B22EC18)	No. of Hours L:0 T:0P:2	Credits:1
After the completion of this course, the students should be able to				
1	Design and implement various Analog modulation and demodulation Techniques and observe the time and frequency domain characteristics			
2	Design and implement various Pulse modulation and demodulation Techniques and observe the time and frequency domain characteristics			
3	Apply different types of Sampling with various Sampling rates and duty Cycles			
4	Design and implement various Digital modulation and demodulation Techniques and observe the waveforms of these modulated Signals practically			
Course Outcome	Year/Semester II Year/ II Sem	Subject Name (Subject Code) Linear and Digital IC Applications Laboratory(B22EC19)	No. of Hours L:0 T:0P:2	Credits:1
After the completion of this course, the students should be able to				
1	Design and implementation of various analog circuits using 741 ICs.			
2	Design and implementation of various Multivibrators using 555 timer.			
3	Design and implement various circuits using digital ICs.			
4	Design and implement ADC, DAC and voltage regulators.			
Course Outcome	Year/Semester II Year/ II Sem	Subject Name (Subject Code) Electronic Circuit Analysis Laboratory(B22EC20)	No. of Hours L:0 T:0P:2	Credits:1
After the completion of this course, the students should be able to				
1	Design power amplifiers and find its efficiency			
2	Design tuned amplifiers and find its Q-factor			
3	Design various multivibrators and sweep circuits. Understand the necessity of linearity			
4	Design sampling gates.			
Course Outcome	Year/Semester II Year/ II Sem	Subject Name (Subject Code) Gender Sensitization Lab(B22MC07)	No. of Hours L:0 T:0P:2	Credits:0
1	Students will have developed a better understanding of important issues related to gender in contemporary India.			
2	Students will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film.			
3	Students will attain a finer grasp of how gender discrimination works in our society and how to counter them. Students will acquire insight into the gendered division of labor and its relation to politics and economics.			
4	Students will develop a sense of appreciation of women in all walks of life. Men and women students and professionals will be better equipped to work and live in harmony			
5	Through providing accounts of studies and movements as well as the new laws that provide protection and relief to women, the textbook will empower students to understand and respond to			



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	gender violence.			
Course Outcome	Year/Semester III Year/ I Sem	Subject Name (Subject Code) MICROCONTROLLERS(B22EC24)	No. of Hours L:3 T:1P:0	Credits:4
1	Known the internal architecture, organization and assembly language programming of 8086processors.			
2	Known the internal architecture, organization and assembly language programming of 8051/controllers			
3	Learn the interfacing techniques to 8086 and 8051 based systems.			
4	Known the internal architecture of ARM processors			
5	Learn the basic concepts of advanced ARM-processors			
Course Outcome	Year/Semester III Year/ I Sem	Subject Name (Subject Code) IoT Architectures and Protocols (B22EC25)	No. of Hours L:3 T:0P:0	Credits:3
1	Explore the Evolution of IoT, its Growth and Applications.			
2	Know the components of IoT and Compare the various architectures of IoT.			
3	Establish the knowledge on various IoT protocols like Data link, Network etc.,			
4	Establish the knowledge on various IoT protocols like like Transport, Session etc.,			
5	Establish the knowledge on various IoT protocols like Service layers, security etc.,			
Course Outcome	Year/Semester III Year/ I Sem	Subject Name (Subject Code) Control Systems(B22EC26)	No. of Hours L:3 T:1P:0	Credits:4
1	Understand the concept of feedback and analyze the control system components by their Mathematical modeling.			
2	Estimate the time domain specification s and steady state error.			
3	Apply various time domain techniques to assess the system performance.			
4	Formulate different types of analysis in frequency domain to explain the nature of stability of the system for different types of controllers			
5	Test system controllability and observability using state space representation and applications of state space representation to various systems			
Course Outcome	Year/Semester III Year/ I Sem	Subject Name (Subject Code) Business Economics & Financial Analysis(B22MB01)	No. of Hours L:3 T:0P:0	Credits:3
1	Understand the various Forms of Business and the impact of economic variables on the Business.			
2	Know what is Demand, Supply, Production, Cost, Market Structure, Pricing aspects.			
3	Know how production function is carried out to achieve least cost combination of Inputs and how to analyze cost			
4	Understand the firm's financial position by analyzing the Financial Statements of a Company			
5	Analyze and interpret financial statements using ratio analysis			
Course Outcome	Year/Semester III Year/ I Sem	Subject Name (Subject Code) Professional Elective-I Computer Organization & Operating Systems (B22EC42)	No. of Hours L:3 T:0P:0	Credits:3
1	Demonstrate and understanding of the functional units of digital computer, instruction sets and their impact on processor design.			
2	Utilize the micro-level operations to control different units in a computer.			
3	Illustrate the concepts of I/O Organization.			
4	Implement operating systems in a computer.			
5	Apply File Management concepts in operating systems and familiarize the directory structure			
Course Outcome	Year/Semester III Year/ I Sem	Subject Name (Subject Code) Professional Elective-I Data Communications and Computer Networks(B22EC43)	No. of Hours L:3 T:0P:0	Credits:3
1	Know the Categories and functions of various Data communication Networks			



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2	Design and analyze various error detection techniques.			
3	Demonstrate the mechanism of routing the data in network layer			
4	Know the significance of various Flow control and Congestion control Mechanisms			
5	Know the Functioning of various Application layer Protocols			
Course Outcome	Year/Semester III Year/ I Sem	Subject Name (Subject Code) Professional Elective-I Electronic Measurements and Instrumentation(B22EC44)	No. of Hours L:3 T:0P:0	Credits:3
1	Measure electrical parameters with different meters and understand the basic definition of measuring parameters.			
2	Use various types of signal generators, signal analyzers for generating and analyzing various real-time signals.			
3	Select specific Oscilloscope to measure various signals in practical fields.			
4	Explain the operations of various transducers required in measurements.			
5	Measure various physical parameters by appropriately selecting the transducers			
Course Outcome	Year/Semester III Year/ I Sem	Subject Name (Subject Code) Microcontrollers Laboratory (B22EC27)	No. of Hours L:0 T:0P:2	Credits:1
1	Write assembly language programs and implement on 8086.			
2	Write assembly language programs and implement on 8051			
3	Interface the I/O devices with 8051 micro controllers			
4	Perform experiments on Cortex-M3 development boards using GNU tool-chain			
Course Outcome	Year/Semester III Year/ I Sem	Subject Name (Subject Code) IoT Architectures and Protocols Laboratory (B22EC28)	No. of Hours L:0 T:0P:2	Credits:1
1	Utilize the different sensors like room temperature, DHT, Humidity etc.,			
2	Interface the sensors and processor for transmission of data.			
3	Capture the images and process it on Arduino/NodeMCU/Raspberry Pi.			
4	know the utilization of various protocols like I2c, UART communication etc			
Course Outcome	Year/Semester III Year/ I Sem	Subject Name (Subject Code) Advanced English Communication Skills Laboratory(B22EN03)	No. of Hours L:0 T:0P:2	Credits:1
1	Participate in group discussion to present their viewpoints briefly and effectively.			
2	Inculcate flair for writing and felicity in written expression in Resume / Curriculum vVitae/Reports.			
3	Participate confidently with appropriate body language in interviews.			
4	Enhance their team building skills and capabilities for effective decision making			
Course Outcome	Year/Semester III Year/ I Sem	Subject Name (Subject Code) Intellectual Property Rights(B22MB06)	No. of Hours L:3 T:0P:0	Credits:0
1	The students get the knowledge about intellectual property, trademarks and copy rights. They also know the rules and regulations related to copy rights. The students will understand the new development in different areas of intellectual property, trade and copy rights.			
Course Outcome	Year/Semester III Year/ II Sem	Subject Name (Subject Code) Antennas and Wave Propagation(B22EC29)	No. of Hours L:3 T:0P:0	Credits:3
1	Explain the mechanism of radiation, definitions of different antenna characteristic parameters and establish their mathematical relations			
2	Estimate the array factor and characteristics of Linear Arrays, Binomial array and sketch their pattern. Illustrate antenna measurements.			
3	Characterize the antennas based on frequency, configure the geometry and establish the radiation patterns of various Antennas and to acquire the knowledge of their analysis, design and development			



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4	Analyze a Microstrip, rectangular patch antenna and a parabolic reflector antenna, identify the requirements and relevant feed structure, carry out the design and establish their patterns			
5	Classify the different wave propagation mechanisms, determine the characteristic features of different wave propagations, and estimate the parameters involved			
Course Outcome	Year/Semester III Year/ II Sem	Subject Name (Subject Code) Digital Signal Processing (B22EC30)	No. of Hours L:3 T:0P:0	Credits:3
1	Outline the properties of systems and signals			
2	Identify the various important characteristics of different transform techniques used in digital signal processing.			
3	Design IIR filters based on the specifications given			
4	Design FIR filters for given specifications			
5	Demonstrate different realizations of digital filters			
Course Outcome	Year/Semester III Year/ II Sem	Subject Name (Subject Code) CMOS VLSI Design (B22EC31)	No. of Hours L:3 T:0P:0	Credits:3
1	Understand IC technology and basic electrical properties of MOS and BiCMOS.			
2	Design the layout of circuits using various design rules.			
3	Develop and design the gate level circuits			
4	Gain the knowledge to design data path subsystems like Adders, Shifters, ALUs etc.			
5	Illustrate different programmable logic devices and CMOS testing			
Course Outcome	Year/Semester III Year/ II Sem	Subject Name (Subject Code) Professional Elective – II Digital Image Processing (B22EC45)	No. of Hours L:3 T:0P:0	Credits:3
1	Explore the fundamental relations between pixels and utility of 2-D transforms in image processing.			
2	Inspect image enhancement in both the spatial and frequency domain.			
3	Evaluate various image restoration techniques.			
4	Explain various image segmentation techniques and morphological operations..			
5	Analyze the different image compression techniques.			
Course Outcome	Year/Semester III Year/ II Sem	Subject Name (Subject Code) Professional Elective – II Mobile Communications and Networks (B22EC46)	No. of Hours L:3 T:0P:0	Credits:3
1	Known the evolution of cellular and mobile communication system.			
2	Explore the Co-Channel and Non-Co-Channel interferences.			
3	Known how to overcome the different fading effects?			
4	Familiar with cell coverage for signal and traffic, diversity, techniques, frequency management, Channel assignment and types of handoff.			
5	Demonstrate the difference between cellular and Adhoc Networks and design goals of MAC Layer protocol			
Course Outcome	Year/Semester III Year/ II Sem	Subject Name (Subject Code) Professional Elective – II Embedded System Design (B22EC47)	No. of Hours L:3 T:0P:0	Credits:3
1	Familiarize the selection procedure of Processors in the embedded domain.			
2	Understand different components required to develop a embedded systems			
3	Design Procedure for Embedded Firmware.			
4	Visualize the role of Real time Operating Systems in Embedded Systems.			
5	Evaluate the Correlation between task synchronization and latency issues			
Course	Year/Semester	Subject Name (Subject Code)	No. of Hours	Credits:1



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Outcome	III Year/ II Sem	Digital Signal Processing Laboratory (B22EC32)	L:0 T:0P:2	
1	Analyze signals using the discrete Fourier transform (DFT).			
2	Understand FFT algorithm for efficient computation of DFT.			
3	Design IIR & FIR filters.			
4	Design multi rate signal processing of signals through systems			
Course Outcome	Year/Semester III Year/ II Sem	Subject Name (Subject Code) CMOS VLSI Design Laboratory (B22EC33)	No. of Hours L:0 T:0P:2	Credits:1
1	Acquire knowledge on High end Simulation tools like Mentor Graphics, Tanner EDA etc.			
2	Design digital circuits at different levels using programming concepts.			
3	Implement any type of digital systems.			
4	Program any available FPGA and CPLD using implementation tool			
Course Outcome	Year/Semester III Year/ II Sem	Subject Name (Subject Code) Advanced Communication Laboratory (B22EC34)	No. of Hours L:0 T:0P:2	Credits:1
1	Understand the features of Spectrum Analyzer.			
2	Analyze to select coding techniques for efficient transmission & reception.			
3	Demonstrate and simulate various modulation and demodulation techniques.			
4	Simulate the Multiplexing technique			
Course Outcome	Year/Semester III Year/ II Sem	Subject Name (Subject Code) Environmental Science (B22CH03)	No. of Hours L:3 T:0P:0	Credits:0
1	Based on this course, the Engineering graduate will understand/evaluate/develop technologies on the basis of ecological principles and environmental regulations which in turn helps in sustainable development			
Course Outcome	Year/Semester IV Year/ I Sem	Subject Name (Subject Code) Microwave and Optical Communications (B22EC38)	No. of Hours L:3 T:1P:0	Credits:4
1	Compare the Power generation of Microwave Tubes and derive the performance characteristics.			
2	Illustrate the concepts, principles of microwave solid-state devices.			
3	Distinguish between the different types of waveguide, ferrite components and select proper components for engineering applications			
4	Measure the S-parameters in microwave component design.			
5	Demonstrate the mechanism of light propagation through Optical Fibres			
Course Outcome	Year/Semester IV Year/ I Sem	Subject Name (Subject Code) Professional Elective – III Radar Systems (B22EC48)	No. of Hours L:3 T:0P:0	Credits:3
1	Illustrate the importance of Radar Fundamentals and analysis of Radar equation.			
2	Compare the functioning of CW and FM-CW Radars.			
3	Distinguish the working principle of MTI with Pulse Doppler Radar.			
4	Evaluate different Radar Tracking Methods.			
5	Perceive detection of Radar signals in Noise and Radar receivers			
Course Outcome	Year/Semester IV Year/ I Sem	Subject Name (Subject Code) Professional Elective – III CMOS Analog IC Design (B22EC49)	No. of Hours L:3 T:0P:0	Credits:3
1	Understand the basic concepts of MOS devices and their models.			
2	Design basic building blocks of CMOS Analog ICs.			



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3	Design various amplifiers like differential, current and operational amplifiers			
4	Carryout the design of single and two stage operational amplifiers.			
5	Understand the characteristics of comparator's and their design.			
Course Outcome	Year/Semester IV Year/ I Sem	Subject Name (Subject Code) Professional Elective – III Artificial Neural Networks(B22EC50)	No. of Hours L:3 T:0P:0	Credits:3
1	Explore the basic elements of Artificial Neural networks and learning process.			
2	Develop different single layer / multilayer perceptron learning algorithms.			
3	Demonstrate the concepts of back propagation.			
4	Explain the concepts of self organizing maps.			
5	Construct the Hopfield models			
Course Outcome	Year/Semester IV Year/ I Sem	Subject Name (Subject Code) Professional Elective – IV Network Security and Cryptography (B22EC51)	No. of Hours L:3 T:0P:0	Credits:3
1	Describe network security fundamental concepts and principles			
2	Encrypt and decrypt messages using block ciphers and network security technology and protocols			
3	Ability to apply cryptographic algorithms, and understand the concepts of number the 27			
4	Analyze key agreement algorithms to identify their weaknesses			
5	Identify and assess different types of threats, malware, spyware, viruses, vulnerabilitie			
Course Outcome	Year/Semester IV Year/ I Sem	Subject Name (Subject Code) Professional Elective – IV Satellite Communications (B22EC52)	No. of Hours L:3 T:0P:0	Credits:3
1	Explore the basic concepts and frequency allocations for satellite communication, orbital mechanics and launch vehicles.			
2	Explain the satellite sub systems and satellite Antennas.			
3	Compare various multiple access techniques and design Satellite Link for specified C/N.			
4	Illustrate the earth station technology and Tracking system.			
5	Relate the concepts of LEO and GEO Stationary Satellite Systems, satellite navigation			
Course Outcome	Year/Semester IV Year/ I Sem	Subject Name (Subject Code) Professional Elective – IV Biomedical Instrumentation(B22EC53)	No. of Hours L:3 T:0P:0	Credits:3
1	Explore bio-systems and medical systems from an engineering perspective.			
2	Identify the techniques to acquire record and primarily understand physiological activity of the human body through cell potential, ECG, EEG, BP and blood flow measurement.			
3	Acquires knowledge about Neurological Instrumentation.			
4	Articulate the working of various medical instruments and critical care equipment.			
5	Explain the imaging techniques including CT,PET, SPECT and MRI used in diagnosis of various medical conditions.			
Course Outcome	Year/Semester IV Year/ I Sem	Subject Name (Subject Code) Professional Practice, Law & Ethics (B22MB10)	No. of Hours L:2 T:0P:0	Credits:2
1	Understand the importance of professional practice			
2	Learn the rights and responsibilities as an employee			
Course Outcome	Year/Semester IV Year/ I Sem	Subject Name (Subject Code) Microwave and Optical Communications Laboratory(B22EC39)	No. of Hours L:0 T:0P:4	Credits:2
1	Demonstrate a microwave bench for measuring microwave parameters			
2	Measure parameters like attenuation, VSWR etc.			
3	Analyze the characteristics of all microwave engineering components			
4	Demonstrate the mechanism of light propagation through optical fibres			



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Course Outcome	Year/Semester IV Year/ II Sem	Subject Name (Subject Code) Professional Elective – V Artificial Intelligence(B22EC54)	No. of Hours L:3 T:0P:0	Credits:3
1		Understand the basics of the theory and about intelligent agents.		
2		Capable of using heuristic searches, aware of knowledge based systems and expert systems.		
3		Apply AI techniques to real-world problems to develop intelligent systems.		
4		Ability to apply knowledge learning techniques to develop intelligent systems.		
5		Select appropriately from a range of techniques when implementing intelligent systems		
Course Outcome	Year/Semester IV Year/ II Sem	Subject Name (Subject Code) Professional Elective – V 5G and beyond Communications (B22EC55)	No. of Hours L:3 T:0P:0	Credits:3
1		Describe the concept of massive MIMO communications		
2		Illustrate mobile wireless technology generations and define SMNAT		
3		Analyze wireless communication channel and channel models for radio wave propagation		
4		Understand device to device (D2D) communication and standardization		
5		Create interference management, mobility management and security issues in 5G		
Course Outcome	Year/Semester IV Year/ II Sem	Subject Name (Subject Code) Professional Elective – V Machine learning(B22EC56)	No. of Hours L:3 T:0P:0	Credits:3
1		Ability to understand the concepts of Neural Networks		
2		Ability to select the Learning Networks in modeling real world systems		
3		Ability to use an efficient algorithm for Deep Models		
4		Ability to apply optimization strategies for large scale applications		
5		Ability to apply graphical models & strategies in machine learning		
Course Outcome	Year/Semester IV Year/ II Sem	Subject Name (Subject Code) Professional Elective – VI Multimedia Database Management Systems(B22EC57)	No. of Hours L:3 T:0P:0	Credits:3
1		Gain knowledge of fundamentals of DBMS, database design and normal forms.		
2		Apply relational model techniques for relational data.		
3		Master the basics of SQL for retrieval and management of data.		
4		Be acquainted with the basics of transaction processing and concurrency control.		
5		Familiarity with database storage structures and access techniques		
Course Outcome	Year/Semester IV Year/ II Sem	Subject Name (Subject Code) Professional Elective – VI System on Chip Architecture (B22EC58)	No. of Hours L:3 T:0P:0	Credits:3
1		Expected to understand SOC Architectural features.		
2		To acquire the knowledge on processor selection criteria and limitations		
3		To acquires the knowledge of memory architectures on SOC.		
4		To understands the interconnection strategies and their customization on SOC.		
5		To learn the different configurations of SOC		
Course Outcome	Year/Semester IV Year/ II Sem	Subject Name (Subject Code) Professional Elective – VI Wireless sensor Networks(B22EC59)	No. of Hours L:3 T:0P:0	Credits:3
1		Analyze and compare various architectures of Wireless Sensor Networks.		
2		Understand Design issues and challenges in wireless sensor networks.		



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3	Understand various routing protocols and MAC protocols.
4	Analyze and compare various data gathering and data dissemination methods.
5	Design, Simulate and Compare the performance of various routing and MAC protocol