



VAAGDEVI COLLEGE OF ENGINEERING AUTONOMOUS

Bollikunta, Khila Warangal (Mandal), Warangal Urban-506 005 (T.S), www.vaagdevi.edu.in

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

VISION OF THE DEPARTMENT

- Towards a Global Knowledge Hub, striving continuously in pursuit of excellence in Education, Research, Entrepreneurship and Technological services to the society in the field of ECE.

MISSION OF THE DEPARTMENT

- To turn out full-fledged Engineers in the field of Electronics & Communication Engineering with an overall back-ground suitable for making a successful career either in industry/research or higher education in India and abroad.
- Imparting total quality education to develop innovative, entrepreneurial and professionals fit for globally competitive environment. Fostering product oriented research for establishing self-sustaining creative centres in ECE to serve the societal needs.



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DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING Program Educational Objectives (PEOs)

B.Tech –Electronics and Communication Engineering

- **PEO1:** Be able to employable as hardware & software professionals in reputed industries.
- **PEO2:** Be able to analyze the problems by applying the principles of Electronics & Communication Engineering, mathematics, and scientific investigation and to design and implement industry accepted solutions using latest technologies.
- **PEO3:** Be able to work productively in supportive and leadership roles on multidisciplinary teams with effective communication and team work skills with high regard to legal and ethical responsibilities.
- **PEO4:** Be able to embrace lifelong learning to meet ever changing developments in Electronics & Communication Engineering.



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DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING Program Outcomes (POs)

B.Tech –Electronics and Communication Engineering:

The following program outcomes are expected to be found in the graduate students on their completion of the 4-year program.

PO-1: Engineering Knowledge: An ability to apply knowledge of mathematics, computing, science, electronics and communication engineering.

PO-2: Problem Analysis: Identify, formulate, research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO-3: 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 public health and safety, and cultural, societal, and environmental considerations.

PO-4: 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.

PO-5: Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO-6: 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.

PO-7: 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.

PO-8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO-9: Individual and Team Work: Function effectively as an individual, and as a member or leader



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in diverse teams, and in multidisciplinary settings.

PO-10: Communication: Communicate effectively on complex engineering activities with the engineering community and with the society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO-11: 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.

PO-12: Life-Long Learning: Recognise the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes (PSOs)

B.Tech –Electronics and Communication Engineering:

Electronics and Communication Engineering Graduates will be able to:

- **PSO1:** To gain an in-depth knowledge about the working principles of Electronics and Communication Engineering System.
- **PSO2:** To design, implement and build systems in Networking, Embedded, VLSI, RF and Wireless Systems.
- **PSO3:** To apply knowledge in order to solve real time problems using the state of the art hardware and software tools and to work in team with ethical and social responsibility.



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Course Outcomes for B.Tech – ECE-R18 for the academic year 2018-19 onwards

Course Outcome	Semester I Sem	Subject Name (Subject Code) LINEAR ALGEBRA AND CALCULUS (B18MA01)	L: 3 T: 1 P: 0 C: 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 analyse the solution of the system of equations.		
2	Find the Eigen values and Eigen vectors and Reduce the quadratic form to canonical form using orthogonal transformations.		
3	Analyse the nature of sequence and series.		
4	Solve the applications on the mean value theorems and Evaluate the improper integrals using Beta and Gamma functions.		
5	Find the extreme values of functions of two variables with/ without constraints.		
Course Outcome	Semester I Sem	Subject Name (Subject Code) PROGRAMMING FOR PROBLEM SOLVING (B18CS01)	L: 4 T: 0 P: 0 C: 4
After the completion of this course, the students should be able to			
1	Understand how problems are posed and how they can be analyzed for obtaining solutions.		
2	Understanding the fundamentals of C programming.		
3	Learn the sequencing, branching, looping and decision making statements to solve scientific and engineering problems.		
4	Implement different operations on arrays and creating and using of functions to solve problems.		
5	Design and implement different types of file structures using standard methodology.		
Course Outcome	Semester I Sem	Subject Name (Subject Code) APPLIED PHYSICS (B18PH01)	L:4 T: 0 P: 0 C: 4
After the completion of this course, the students should be able to			



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1	Illustrate fabrication of semi conductors, photo detectors, design basis of quantum mechanics		
2	Recall facts of wave optics extend & construct basics of wave optics.		
3	Interpret about lasers, which leads to new innovations and improvements		
4	Elaborate and formulate the study of characterization properties of opto-devices, organize the students to prepare new materials for various engineering applications		
5	Apply basic knowledge on principles and recalls facts of light properties, and motivate for new innovations. analyze applications of optical fibers		
Course Outcome	Semester I Sem	Subject Name (Subject Code) ENGLISH (B18EN01)	L: 2 T: 0 P: 0 C: 2
After the completion of this course, the students should be able to			
1	Recall the enrichment of comprehension and fluency will be adaptable.		
2	Gain confidence in using language in varied situations		
3	Develops neutralization of accent for intelligibility.		
4	Adapt effective speaking abilities.		
5	Develops and Communicates by stating main ideas relevantly and coherently in speaking & writing.		
Course Outcome	Semester I Sem	Subject Name (Subject Code) APPLIED PHYSICS LAB (B18PH02)	L: 0 T: 0 P: 3 C: 1.5
After the completion of this course, the students should be able to			
1	Operate different equipments related to light & electronics.		
2	Develop experimental skills to design new experiments & circuit design.		
3	Understand about modern equipment like solar cell, optical fiber etc.,		
4	Have Exposure to develop novel semi conductor devices.		
Course Outcome	Semester I Sem	Subject Name (Subject Code) ENGINEERING WORKSHOP & IT WORKSHOP (B18ME02)	L: 0 T: 0 P: 3 C: 1.5
After the completion of this course, the students should be able to			
1	Know the usage of various tools and their applications in carpentry, tin smithy.		



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2	Understand the usage of various tools and their application in black smithy, foundry, welding and house wiring.		
3	Make lap joint and dove tail joint in carpentry, scoope, funnel and tray items in tin smithy.		
Course Outcome	Semester I Sem	Subject Name (Subject Code) PROGRAMING FOR PROBLEM SOLVING LAB (B18CS02)	L: 0 T: 0 P: 2 C: 1
After the completion of this course, the students should be able to			
1	Understand how problems are posed and how they can be analyzed for obtaining solutions..		
2	Understand basic structure of the C programming, declaration and usage of variables.		
3	Write C programs using operators. Implement different operations on arrays and creating and using of functions to solve problems.		
4	Learn the sequencing, branching, looping and implement different types of file structures and decision making statements to solve scientific and engineering problems.		
Course Outcome	Semester II Sem	Subject Name (Subject Code) DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS (B18MA02)	L: 3 T: 1 P: 0 C: 4
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 order differential equation and apply the concept of differential equation to real world problems		
3	Evaluate the multiple integrals and apply the concept to find areas, volumes, centre of mass and Gravity for cubes, sphere and rectangular parallelopiped		
4	Utilize the concept of gradient divergence and curl of a vector field to predict area and volumes.		
5	Evaluate the line, surface and volume integrals and converting them from one to another.		
Course Outcome	Semester II Sem	Subject Name (Subject Code) ENGINEERING CHEMISTRY (B18CH01)	L: 3 T: 1 P: 0 C: 4
After the completion of this course, the students should be able to			
1	Recall previous knowledge regarding atomic and molecular structure.		
2	Design polymeric engineering materials. Recall basic organic reactions		



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3	Construct batteries and classify different electronics and electrical like cells , electrodes, e.t.c...help them to construct different electrical/ electronic parts.
4	Examine which type of impurities is present in water, specification of drinking water and explain the corrosion behavior/ activity of metals.
5	Apply phase rule and adsorption to construct the materials by analyzing their compositions.

Course Outcome	Semester II Sem	Subject Name (Subject Code) ENGINEERING GRAPHICS (B18ME01)	L: 1 T: 0 P: 4 C: 3
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After the completion of this course, the students should be able to

1	Learn the development of surfaces.
2	Understand the projections of solids
3	Understand the isometric projections.
4	Understand the orthographic projections.
5	Make the use of drawings, dimensioning, scales and conic sections.

Course Outcome	Semester II Sem	Subject Name (Subject Code) ELECTRICAL CIRCUITS(B18EE04)	L: 3 T: 0 P: 0 C: 3
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After the completion of this course, the students should be able to

1	Learn basic concepts of electrical circuits, electrical parameters etc
2	Relate the learned basics to understand the AC and DC circuits
3	Analyse and solve the electric and magnetic circuits
4	Learn to demonstrate various network theorems and resonance condition
5	Apply various network theorems to solve real time application
6	Assess various above concepts in real world problems

Course Outcome	Semester II Sem	Subject Name (Subject Code) ELECTRONIC DEVICES AND CIRCUITS (B18EC01)	L: 3 T: 0 P: 0 C: 3
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After the completion of this course, the students should be able to



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1.	Explain the semiconductor theory and characteristics of the PN junction diode and Zener diode.
2.	Compare and contrast the rectifiers with and without filters.
3.	Understand the construction and voltage- current characteristics of Junction Transistor and illustrate the different configurations of transistor
4.	Design and analyze the different biasing circuits and amplifier circuits.
5.	Acquire knowledge about the construction, theory and characteristics of FET and MOSFET.

Course Outcome	Semester II Sem	Subject Name (Subject Code) ELECTRONIC DEVICES AND CIRCUITS LAB (B18EC02)	L: 0 T: 0 P: 2 C: 1
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After the completion of this course, the students should be able to

1	Identify and find the values of resistors, capacitors and inductors.
2	Measure voltage, frequency and phase of any waveform using CRO
3	Demonstrate the characteristics and operation of electronic devices.
4	Demonstrate various amplifier circuits.

Course Outcome	Semester II Sem	Subject Name (Subject Code) ENGLISH LANGUAGE & COMMUNICATIONS SKILLS LAB (B18EN02)	L: 0 T: 0 P: 2 C: 1
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After the completion of this course, the students should be able to

1	Capable in Better Understanding of nuances of language through audio-visual experience and group activities.
2	Able to develop Neutralization of accent for intelligibility.
3	Capable to Speak out with clarity and confidence thereby enhances the employability skills of the students by acquiring knowledge and techniques.
4	Extends to speak fluent English, through advanced vocabulary to improve quality in speaking.

Course Outcome	Semester II Sem	Subject Name (Subject Code) ENVIRONMENTAL SCIENCE (B18MC02)	L: 0 T: 0 P: 2 C: 0
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After the completion of this course, the students should be able to			
1	Recall previously learned ecosystem and find how the biodiversity changes went in the environment.		
2	Demonstrate outlines of types of pollutions and explain in related to day to day life.		
3	Apply models of food chains and energy flow models to solve the identified parameters.		
4	Classify the types of pollutants and distinguish the functions of sustainable development that take part in the environment.		
5	Design the experiments with BOD,COD, OD and estimate the micro organisms which cause contamination and can propose solutions.		
Course Outcome	Semester III Sem	(Subject Code)Subject Name (B18MA03) NUMERICAL METHODS & COMPLEX VARIABLES	L: 3 T: 1 P: 0 C: 4
After the completion of this course, the students should be able to			
1	Find a better approximate root of a given equation.		
2	Estimate the derivative at a given value and integral of function.		
3	Analyze the complex function with reference to their analyticity, integration using Cauchy's integral and residue theorems.		
4	Taylor's and Laurent's series expansions of complex function.		
5	Evaluate bilinear transformation.		
Course Outcome	Semester III Sem	(Subject Code)Subject Name (B18EC03) SIGNALS AND SYSTEMS	L: 3 T: 1 P: 0 C: 4
After the completion of this course, the students should be able to			
1	Apply the knowledge of vectors, orthogonal basis to signals. Analyze the spectral characteristics of continuous-time periodic signals using Fourier series.		
2	Demonstrate and apply Fourier transform on various signals.		
3	Apply the Laplace transform and Fourier transform for the analysis of continuous-time signals.		
4	Analyze systems based on their properties and determine the response of LTI system.		
5	Understand the concepts of convolution and correlation of signals.		
Course Outcome	Semester III Sem	(Subject Code)Subject Name (B18EC04) ELECTRONIC CIRCUITS ANALYSIS	L: 3 T: 1 P: 0 C: 4
After the completion of this course, the students should be able to			
1	Construct and analyze the Low frequency model of transistor and evaluate the h-parameters.		
2	Analyze the single and multi stage amplifiers in high frequency region.		
3	Design and construct the negative feedback amplifiers and oscillators according to the required specifications.		
4	Determine the efficiencies of large signal amplifiers.		
5	Compare and contrast various tuned amplifiers.		
Course Outcome	Semester III Sem	(Subject Code)Subject Name (B18EC05) SWITCHING THEORY AND LOGIC DESIGN	L: 3 T: 0 P: 0 C: 3



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After the completion of this course, the students should be able to			
1	Utilize and explain the functionality of logic gates (AND, NAND, OR, NOR, XOR, XNOR, NOT).		
2	Design different combinational circuits using minimization techniques.		
3	Explain various flip flops, and design of registers and counters.		
4	Apply the design procedures to design basic sequential circuits.		
5	Analyze and design of small sequential circuits and to use standard sequential functions/building blocks to build more complex circuits.		
Course Outcome	Semester III Sem	(Subject Code)Subject Name (B18EE05) ELECTRICAL TECHNOLOGY	L: 3 T: 0 P: 0 C: 3
After the completion of this course, the students should be able to			
1	Learn various ways of representing electrical networks and explore methods of analyzing the networks		
2	Understand and analyze the dual networks		
3	Study the basics of magnetic circuits and its analysis		
4	Study and analyze the Construction, basic principles of operation and characteristics of DC machines, Transformers and AC machines		
5	Explore various testing and applications of all machines		
Course Outcome	Semester III Sem	(Subject Code)Subject Name (B18EC06) ELECTRONIC CIRCUITS ANALYSIS LAB	L: 0 T: 0 P: 2 C: 1
After the completion of this course, the students should be able to			
1	Understand the concept of multistage amplifiers, analysis of multistage amplifier and plot frequency response.		
2	Design, construct and test amplifier circuits and interpret the results.		
3	Operate electronic test equipment and hardware/software tools to characterize the behavior		
4	Synthesize and evaluate single stage and two stage amplifiers.		
Course Outcome	Semester III Sem	(Subject Code)Subject Name (B18EC07) SIMULATION LAB	L: 0 T: 0 P: 2 C: 1
After the completion of this course, the students should be able to			
1	Illustrate different types of signals and methods of generating them using MATLAB.		
2	Demonstrate the importance of convolution and correlation for different applications.		
3	Capable to understand the characterization of random signals and explains the concept and relevance of noise in signal processing applications.		
4	Design and develop functional simulation, timing analysis using MATLAB.		
Course Outcome	Semester III Sem	Subject Code)Subject Name (B18CS56) PYTHON SCRIPTING LANGUAGE LAB	L: 0 T: 0 P: 2 C: 1
1	Read, write, execute by hand simple Python programs.		
2	Structure simple Python programs and decomposing program into functions.		
3	Represent compound data using Python lists, tuples, dictionaries.		



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4	Read and write data from/to files in Python Programs		
Course Outcome	Semester III Sem	(Subject Code)Subject Name (B18EC08) PULSE AND DIGITAL CIRCUITS	L: 3 T: 1 P: 0 C: 4
After the completion of this course, the students should be able to			
1	Design the circuits for generating desired wave shapes (non-sinusoidal) for different applications like computers, control systems and counting and timing systems.		
2	Analyze the applications of diode as Integrator, differentiator, clippers and clamper circuits.		
3	Analyze the switching characteristics and applications of diode and transistor.		
4	Analyze and design Multivibrators for various applications, synchronization techniques and sweep circuits		
5	Design the time base generators and sampling gates with the knowledge of basic principles		
Course Outcome	Semester IV Sem	(Subject Code)Subject Name (B18EC09) ELECTROMAGNETIC THEORY AND TRANSMISSION LINES	L: 3 T: 1 P: 0 C: 4
After the completion of this course, the students should be able to			
1	Apply vector calculus to electrostatic fields in different engineering situations. Use Gauss's Law, Coulomb's law to find fields and potentials for a variety of situations including charge distributions.		
2	Explain, illustrate & can apply the concept of magnetostatics in different engineering situations.		
3	Analyze & explain the concept of conductors, dielectrics & capacitance, electromagnetic waves characteristics & terminologies and; be able to compute the Pointing vector and identify the power flow direction.		
4	Study time varying Maxwell's equations and their applications is electromagnetic problems.		
5	Describes the transmission lines with equivalent circuit and explain their characteristics & use its knowledge in different engineering situations.		
Course Outcome	Semester IV Sem	(Subject Code)Subject Name (B18EC10) ANALOG COMMUNICATIONS & DIGITAL COMMUNICATIONS	L: 3 T: 1 P: 0 C: 4
After the completion of this course, the students should be able to			
1	Analyze and simulate the concepts of AM and AM Demodulation in communication.		
2	Interpret with various angle modulation and demodulation systems		
3	Demonstrate the understanding of various baseband transmission techniques.		
4	Demonstrate the understanding of various digital modulation and demodulation techniques.		
5	Explain different error detection and error correction codes like block codes, cyclic codes and convolution codes.		
Course Outcome	Semester IV Sem	(Subject Code)Subject Name (B18EC11) PROBABILITY THEORY AND STOCHASTIC PROCESS	L: 3 T: 0 P: 0 C: 3
After the completion of this course, the students should be able to			



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1	Understand the basic concepts of probability theory and random processes.		
2	Solve simple engineering problems with the knowledge of two dimensional random variables.		
3	Compare and contrast the various random processes.		
4	Analyze the autocorrelation and cross correlation functions and their properties.		
5	Understand concepts of information theory and Shannon law.		
Course Outcome	Semester IV Sem	(Subject Code)Subject Name (B18EC12) COMPUTER ORGANIZATION	L: 3 T: 0 P: 0 C: 3
After the completion of this course, the students should be able to			
1	Explain the I/O and memory organization in depth.		
2	Develop assembly language programs for various applications		
3	Estimate the basic components of computers and Extend the design of Digital Logic Circuits and apply to Computer Organisation.		
4	Analyse the memory organization and Evaluate the performance of Computer systems		
5	Understand the basic chip design and organization of 8086 with assembly language programming and Compare RISC and CISC Architectures		
Course Outcome	Semester IV Sem	(Subject Code)Subject Name (B18EC13) PULSE AND DIGITAL CIRCUITS LAB	L: 0 T: 0 P: 2 C: 1
After the completion of this course, the students should be able to			
1	Understand the applications of diode as integrator, differentiator, clippers and clamper circuits.		
2	Demonstrate basic logic gates and sampling gates.		
3	Design and analyze various multivibrator circuits and schmitt trigger circuit.		
4	Design and analyze UJT relaxation oscillator and boot-strap sweep circuits		
Course Outcome	Semester IV Sem	(Subject Code)Subject Name (B18EE06) ELECTRICAL TECHNOLOGY LAB	L: 0 T: 0 P: 2 C: 1
After the completion of this course, the students should be able to			
1	Verify network theorems		
2	Design the range of apparatus for various testing of DC machines and study their characteristics		
3	Evaluate the efficiency and regulations of DC machines based on the test results		
4	Conduct various speed control methods of DC machines		
Course Outcome	Semester IV Sem	Subject Code)Subject Name (B18EC14) ANALOG COMMUNICATIONS & DIGITAL COMMUNICATIONS LAB	L: 0 T: 0 P: 2 C: 1
1	Understand the different types of modulation techniques.		
2	Assess different digital modulation and demodulation techniques.		
3	Apply suitable modulation schemes and coding for various applications.		



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4	Analyze and Implement Analog to digital converters like PCM and DM		
Course Outcome	Semester V Sem	(Subject Code)Subject Name (B18EC15) LINEAR & DIGITAL IC APPLICATIONS	L: 3 T: 1 P: 0 C: 4
After the completion of this course, the students should be able to			
1	Understand the op Amp and its applications in lading wave form generators.		
2	Design and describe the concepts of timer using IC 555, basic principle of PLL operation and also able to understand various ADC and DAC techniques.		
3	Gain the programming concepts of HDL used for designing VLSI integration circuits.		
4	Able to do HDL based design of Combinational and sequential circuits including memories.		
Course Outcome	Semester V Sem	(Subject Code)Subject Name (B18EC16) DIGITAL SIGNAL PROCESSING	L: 3 T: 0 P: 0 C: 3
After the completion of this course, the students should be able to			
1	Explain the time domain and frequency domain representation of the signals.		
2	Identify the different types of the systems and their responses.		
3	Understand the inter relationship between DFT and various transforms and fast computation of DFT and appreciate the FFT processing.		
4	Classify the different types of windowing techniques.		
5	Design a digital filters for a given specifications and Apply the knowledge to real world processing applications.		
Course Outcome	Semester V Sem	(Subject Code)Subject Name (B18CS53) COMPUTER NETWORKS	L: 3 T: 0 P: 0 C: 3
After the completion of this course, the students should be able to			
1	He/She Will be in a position to understand WorldWide concepts.		
2	Students should be able to demonstrate and explore the basics of Computer Networks and various protocols.		
3	Will be in position to administrate a network and flow of information.		
4	Able to contrast different internetworking protocols.		
5	Able to demonstrate different Internet Transport Protocols		
Course Outcome	Semester V Sem	(Subject Code)Subject Name (B18EE15) CONTROL SYSTEMS(Professional Elective – I)	L: 3 T: 0 P: 0 C: 3
After the completion of this course, the students should be able to			
1	Understand the concept of feedback and analyze the control system components by their Mathematical modeling.		
2	Estimate the time domain specifications and steady state error.		
3	Apply various time domain and frequency domain techniques to assess the system performance.		
4	Improve the system performance by designing a suitable controller and/or a compensator for a specific application.		



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5	Test system Controllability and Observability using state space representation and applications of state space representation to various systems.		
Course Outcome	Semester V Sem	(Subject Code)Subject Name (B18EC17) TELECOMMUNICATION SWITCHING SYSTEMS AND NETWORKS(Professional Elective – I)	L: 3 T: 0 P: 0 C: 3
After the completion of this course, the students should be able to			
1	Understand the physical configurations of telecommunication network evaluate.		
2	Different switching networks scwsed		
3	Analyze recommendations of CCITT		
4	Understand use and implementation of packet switching.		
5	Evaluate advance cellular networks.		
Course Outcome	Semester V Sem	(Subject Code)Subject Name (B18CS52) OOPS THROUGH JAVA (Professional Elective – I)	L: 3 T: 0 P: 0 C: 3
1	A strong foundation in core Computer Science and Engineering, both theoretical and applied concepts.		
2	An ability to apply knowledge of mathematics, science, and engineering to real-world problems.		
3	Ability to model, understand, and develop complex software for System Software as well as Application Software.		
4	An ability to function effectively within teams.		
5	An ability to communicate effectively, both in writing and oral.		
Course Outcome	Semester V Sem	Subject Code)Subject Name (B18MB01) MANAGERIAL ECONOMICS & FINANCIAL ANALYSIS	L: 3 T: 0 P: 0 C: 3
1	Understand the nature, scope and importance of Managerial Economics.		
2	Know what is demand, analyze demand and how elasticity of demand is used for pricing decisions and to evaluate methods for forecasting demand.		
3	Know how production function is carried out to achieve least cost combination of Inputs and how to analyze cost.		
4	Understand the characteristics of different kinds of markets and outline different form of business organization and analyze how capital budgeting techniques are used for investment decisions.		
5	Know how to prepare final accounts and how to interpret them, analyze and interpret financial statements using ratio analysis.		
Course Outcome	Semester V Sem	(Subject Code)Subject Name (B18EC18) LDIC LAB	L: 0 T: 0 P: 3 C: 1.5
After the completion of this course, the students should be able to			
1	Design circuits using operational amplifiers for various applications practically.		



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2	Understand the different logical gates & decoders, flip-flops.		
3	Apply the knowledge of OP-AMPS to design various analog circuits.		
4	Compare linear and digital integrated IC's		
Course Outcome	Semester V Sem	(Subject Code)Subject Name (B18EC19) DIGITAL SIGNAL PROCESSING LAB	L: 0 T: 0 P: 2 C: 1
After the completion of this course, the students should be able to			
1	Analyze signals using the discrete Fourier transform (DFT).		
2	Understand circular convolution, its relationship to linear convolution, and how circular convolution can be achieved via the discrete Fourier transform.		
3	Analyze the decimation in time and frequency FFT algorithms for efficient computation of the DFT.		
4	Design digital filters on paper and implement the design by using MATLAB.		
Course Outcome	Semester V Sem	(Subject Code)Subject Name (B18CS54)COMPUTER NETWORKS LAB	L: 0 T: 0 P: 3 C: 1.5
1	Implement data link layer farming methods		
2	Analyze error detection and error correction codes.		
3	Implement and analyze routing and congestion issues in network design.		
4	Implement Encoding and Decoding techniques used in presentation layer		

Course Outcome	Semester VI Sem	(Subject Code)Subject Name (B18EC20) MICROPROCESSORS AND MICROCONTROLLERS	L: 3 T: 1 P: 0 C: 4
After the completion of this course, the students should be able to			
1	Illustrate the internal organization of popular 8086/8051 microprocessors/microcontrollers.		
2	Contrast hardware and software interaction and integration.		
3	Design microprocessors and microcontrollers based systems and develop microcontroller based systems for real time applications		
4	Develop knowledge about microcontroller 8051 and its programming.		
5	Explain the Memory organization, classification and their applications and Assess programming, interfacing etc of various devices with microprocessors and external world.		
Course Outcome	Semester VI Sem	(Subject Code)Subject Name (B18EC21) VLSI DESIGN	L: 3 T: 0 P: 0 C: 3
After the completion of this course, the students should be able to			
1	Understand IC technology and basic electrical properties of MOS and BiCMOS.		
2	Design the layout circuits using various design rules.		
3	Develop and design the gate level circuits		



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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	Semester VI Sem	(Subject Code)Subject Name (B18EC22) ANTENNAS AND WAVE PROPAGATION	L: 3 T: 0 P: 0 C: 3
After the completion of this course, the students should be able to			
1	Define the parameters like antenna efficiency, beam efficiency, radiation resistance etc. in the design of an antenna.		
2	Explain the designed antenna and field evaluation under various conditions and formulate the electric as well as the magnetic fields Equation set for Far field and near field conditions.		
3	Design a lens structure and also the bench step for antenna parameter measurement of testing for their effectiveness.		
4	Analyse the Electric and Magnetic field emission from various basic antennas and mathematical formulation of the analysis		
5	Understand the design issues, operation of fundamental antennas like Yagi-Uda, Horn antennas and helical structure and also their operation methodology in practice		
Course Outcome	Semester VI Sem	(Subject Code)Subject Name (B18EC23) BIOMEDICAL INSTRUMENTATION(Professional Elective – II)	L: 3 T: 0 P: 0 C:3
After the completion of this course, the students should be able to			
1	Understand the functions of bio amplifiers, characteristics of medical instruments and bio signals.		
2	Discuss the various internal, external Bio electrodes and relations between electrical and mechanical activities of heart.		
3	Compare various concepts of Cardiac Instrumentation and gain the knowledge about		
4	Analyze the Therapeutic Equipment and their operation.		
5	Acquires knowledge about neuro-muscular Instrumentation like ECG EMG and EEG.		
Course Outcome	Semester VI Sem	(Subject Code)Subject Name (B18CS57) DATA COMMUNICATIONS NETWORKS(Professional Elective – II)	L: 3 T: 0 P: 0 C: 3
After the completion of this course, the students should be able to			
1	A strong foundation in core Computer Science and Engineering, both theoretical and applied concepts.		
2	An ability to apply knowledge of mathematics, science, and engineering to real-world problems.		
3	The broad education necessary to understand the impact of Computer Science and Engineering solutions in the scientific, societal, and human contexts		
4	A recognition of the need for, and an ability to engage in life-long learning.		
Course Outcome	Semester VI Sem	(Subject Code)Subject Name (B18EC24) DIGITAL IMAGE PROCESSING (Professional Elective – II)	L: 3 T: 0 P: 0 C: 3



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After the completion of this course, the students should be able to			
1	Gain the knowledge of digital image fundamentals and image transforms.		
2	Discuss the analysis of image enhancement in spatial and frequency domain.		
3	Understand the different methods to restore an image.		
4	Inspect different image segmentation techniques and understand morphological image processing.		
5	Analyze the different image compression techniques.		
Course Outcome	Semester VI Sem	(Subject Code)Subject Name B18EC25) RADAR SYSTEMS(Professional Elective – III)	L: 3 T: 0 P: 0 C: 3
After the completion of this course, the students should be able to			
1	Illustrate the importance of radar fundamentals and analysis of the radar equation.		
2	Understand the working principle of CW and FM-CW radar and its applications.		
3	Understand the working principle of MTI and pulse Doppler radar.		
4	Understand the different radar tracking methods.		
5	Understand about radar receivers and also extraction radar signal in noise.		
Course Outcome	Semester VI Sem	Subject Code)Subject Name (B18EC26) DIGITAL SIGNAL PROCESSORS AND ARCHITECTURES (Professional Elective – III)	L: 3 T: 0 P: 0 C: 3
1	Distinguish between the architectural features of General purpose processors and DSP processors.		
2	Discuss and understand the architectures of TMS320054xx and ADSP 2100 DSP devices.		
3	Explain the DSP computational building blocks and addressing capabilities.		
4	Demonstrate simple assembly language programs using instruction set of TMS320C54xx.		
5	Analyze the interface of various devices to DSP Processors.		
Course Outcome	Semester VI Sem	Subject Code)Subject Name (B18EC27) REAL TIME OPERATING SYSTEMS (Professional Elective – III)	L: 3 T: 0 P: 0 C: 3
1	Learn basics of OS and RTOS		
2	Implement the design in hardware and software and measure performance against the design constraints.		
3	Learn basics of Linux and RT Linux.		
4	Contrast hardware and software interaction and integration.		
Course Outcome	Semester VI Sem	Subject Code)Subject Name (B18EC28) VLSI & e-CAD LAB	L: 0 T: 0 P: 2 C: 1
1	Develops the knowledge of working with 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.		



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Course Outcome	Semester VI Sem	Subject Code)Subject Name (B18EC29) MICROPROCESSORS AND MICROCONTROLLERS LAB	L: 0 T: 0 P:3 C:1.5
1	Demonstrate experimentally basic programming of Microprocessor.		
2	Recall the microprocessor interfacing with various peripherals for various applications.		
3	Apply the basic programming of microcontroller.		
4	Examine microprocessor interfacing with various peripherals for various applications.		
Course Outcome	Semester VI Sem	Subject Code)Subject Name (B18EN03) ADVANCED ENGLISH COMMUNICATION SKILLS LAB	L: 0 T: 0 P:3 C:1.5
1	Developing effectively and appropriate vocabulary to be used contextually..		
2	Inculcating flair for Writing and felicity in written expression		
3	Enhancing job prospects.		
4	Acquiring effective speaking abilities		
Course Outcome	Semester VI Sem	Subject Code)Subject Name (B18MC05) LOGICAL REASONING & QUALITATIVE APTITUDE	L: 0 T: 0 P:2 C:0
1	To improve their logical thinking in terms of general and mathematical concepts.		
2	The main outcome is to improve students to compete in academic as well as competitive levels through which students are able to solve the real world problems.		
Course Outcome	Semester VII Sem	(Subject Code)Subject Name (B18EC30) MICROWAVE ENGINEERING	L: 3 T: 0 P: 0 C: 3
After the completion of this course, the students should be able to			
1	Understand the significance of microwaves and microwave transmission lines.		
2	Analyze the characteristics of microwave tubes and compare them.		
3	Identify the different wave guide components and application.		
4	Learn the different types of microwave solid state devices.		
5	Gain knowledge of microwave Measurement.		
Course Outcome	Semester VII Sem	(Subject Code)Subject Name (B18EC31) EMBEDDED SYSTEMS DESIGN	L: 3 T: 0 P: 0 C: 3
After the completion of this course, the students should be able to			
1	Understand the architecture of Arm processors.		
2	Develop a system using IO devices and networks.		
3	Understand and design embedded systems.		
4	Understand types of memory and interacting to external world.		
5	Understand embedded firmware design approaches		
Course Outcome	Semester VII Sem	(Subject Code)Subject Name (B18EC32)CELLULAR AND MOBILE COMMUNICATIONS (Professional Elective – IV)	L: 3 T: 0 P: 0 C: 3



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After the completion of this course, the students should be able to			
1	Estimate the impairments due to multi path fading channel.		
2	Relate and explain the functioning of frequency management, Channel assignment and types of handoff		
3	Explain an Importance of the fundamental techniques to overcome the different fading effects.		
4	Distinguish the co-channel and Non co-channel interference.		
5	Inspect cell coverage for signal and traffic, diversity techniques and mobile antennas.		
Course Outcome	Semester VII Sem	(Subject Code)Subject Name (B18EC33) FPGA ARCHITECTURE & APPLICATIONS (Professional Elective – IV)	L: 3 T: 0 P: 0 C: 3
After the completion of this course, the students should be able to			
1	Learn the different types of PLD's and architectures of Xilinx, CPLD's.		
2	Develop the programming Technology skills of FPGA		
3	Demonstrate various types of FPGA's used for memories and architectures		
4	Conclude about Anti fused FPGA and their programming.		
5	Explain the importance of programming various FPGA and CPLD using simulators like Xilinx.		
Course Outcome	Semester VII Sem	(Subject Code)Subject Name (B18CS35) ARTIFICIAL INTELLIGENCE (Professional Elective – IV)	L: 3 T: 0 P: 0 C: 3
After the completion of this course, the students should be able to			
1	Remember various AI concepts like the AI technique, level of models, there underlying assumptions etc		
2	Understand the concepts of AI search techniques and apply knowledge Representation techniques		
3	Analyze different structures of representation		
4	Evaluate AI search techniques		
5	Create Expert systems		
Course Outcome	Semester VII Sem	(Subject Code)Subject Name (B18CS34) INFORMATION THEORY AND CODING (Professional Elective – V)	L: 3 T: 0 P: 0 C: 3
After the completion of this course, the students should be able to			
1	Illustrate the basic notions of information and channel capacity		
2	Demonstrate the different digital modulation schemes.		
3	Explain how error control coding techniques are applied in communication systems		
4	Make use of different compression techniques to analyze the text and image.		
5	Justify the importance of audio and video schemes		
Course Outcome	Semester VII Sem	(Subject Code)Subject Name	L: 3 T: 0 P: 0 C: 3



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(B18EC35) SATELLITE COMMUNICATIONS (Professional Elective – V)			
After the completion of this course, the students should be able to			
1	Understand the historical background, basic concepts and frequency allocations for satellite communication		
2	Demonstrate orbital mechanics, launch vehicles and launchers.		
3	Define the design of satellite links for specified CI N wh system design examples.		
4	Examine the satellite sub systems like Telemetry, tracking, command and monitoring power systems etc. And Explain satellite access techniques		
5	Judge the various multiple access systems for satellite communication systems and satellite packet communications.		
Course Outcome	Semester VII Sem	Subject Code)Subject Name (B18EC36) SPEECH PROCESSING(Professional Elective – V)	L: 3 T: 0 P: 0 C: 3
1	Learn the fundamentals of digital speech processing		
2	Demonstrate the different time domain models of speech processing.		
3	Understand the concepts of linear predictive coding for speech processing.		
4	Analyze the different techniques of speech processing		
5	Make use of different speech and speaker recognition techniques.		
Course Outcome	Semester VII Sem	Subject Code)Subject Name (B18EC37) MICROWAVE ENGINEERING LAB	L: 0 T: 0 P: 2 C: 1
1	Demonstrate a microwave bench for measuring microwave parameters.		
2	Measure parameters like attenuation, VSWR, etc.,		
3	Gain knowledge about Various components used for Microwave communication and their applications		
4	Analyze the characteristics of all microwaves engineering component		
Course Outcome	Semester VII Sem	Subject Code)Subject Name (B18EC38) EMBEDDED SYSTEMS DESIGN LAB	L: 0 T: 0 P: 2 C: 1
1	Develop the programming concepts of 8bit, 16bit, and 32 bit micro controllers.		
2	Analyze the different I/O devices and their interfacing concepts.		
3	Understand the concepts of real time applications.		
Course Outcome	Semester VII Sem	Subject Code)Subject Name (B18EC39) MINI PROJECT AND INTERNSHIP	L: 0 T: 0 P: 0 C: 2
1	Demonstrate a sound technical knowledge of their selected project topic.		
2	Identify and summarize an appropriate list of literature review, analyze previous researchers' work and relate them to current project.		



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3	Present the project outlining the approach and expected results using good oral and written presentation skills.		
4	Apply critical and creative thinking in the design of engineering projects not only limited to electronics and communication engineering domain but if possible to other interdisciplinary domains as well.		
5	Design and develop a functional product prototype while working in a team		
6	Communicate with engineers and the community at large in written and oral forms.		
7	Consider the business context and commercial positioning of designed devices or systems		
Course Outcome	Semester VII Sem	(Subject Code)Subject Name (B18EC40) PROJECT PHASE – I	L: 0 T: 0 P: 8 C: 4
1	Demonstrate a sound technical knowledge of their selected project topic.		
2	Identify and summarize an appropriate list of literature review, analyze previous researchers' work and relate them to current project.		
3	Formulate clearly a work plan and procedures.		
4	Present the project outlining the approach and expected results using good oral and written presentation skills.		
5	Undertake problem identification, formulation and solution.		
6	Apply critical and creative thinking in the design of engineering projects not only limited to electronics and communication engineering domain but if possible to other interdisciplinary domains as well.		
7	Design and develop a functional product prototype while working in a team		
8	Demonstrate the knowledge, skills and attitudes of a professional engineer when working in a team or working as a team leader.		
9	Communicate with engineers and the community at large in written and oral forms.		
10	Consider the business context and commercial positioning of designed devices or systems		
Course Outcome	Semester VIII Sem	(Subject Code)Subject Name (B18EC41) FIBER OPTICAL COMMUNICATIONS(Professional Elective – VI)	L: 3 T: 0 P: 0 C: 3
After the completion of this course, the students should be able to			
1	Understand and analyze the constructional parameters of optical fibres.		
2	Be able to design an optical system.		
3	Estimate the losses due to attenuation, absorption, scattering and bending.		
4	Compare various optical detectors and choose suitable one for different applications.		
5	Develop the concepts of optical system design.		
Course Outcome	Semester VIII Sem	(Subject Code)Subject Name (B18EC42) LOW POWER VLSI DESIGN (Professional Elective – VI)	L: 3 T: 0 P: 0 C: 3
After the completion of this course, the students should be able to			
1	Develop the knowledge of Low power CMOS designs, for digital circuits.		
2	Illustrate low power circuit design styles for VLSI circuits.		
3	Justify software power estimation and optimization methods for VLSI circuits.		
4	Outline the Low-Voltage Low-Power Memories.		



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5	Demonstrate the fabrication process of integrated circuit using VTCMOS, MTCMOS.		
Course Outcome	Semester VIII Sem	(Subject Code)Subject Name (B18CS40) INTERNET OF THINGS (Professional Elective – VI)	L: 3 T: 0 P: 0 C: 3
After the completion of this course, the students should be able to			
1	Interpret the vision of IOT from a global context.		
2	Perceive building blocks of Internet of Things and its characteristics		
3	Learn the basic concepts of Python		
4	Implement the python programming using Raspberry.		
5	Realize the revolution of Internet in Mobile Devices, Cloud & Sensor Networks		
Course Outcome	Semester VIII Sem	(Subject Code)Subject Name (B18EC43) TECHNICAL SEMINAR	L: 0 T: 0 P: 2 C: 1
After the completion of this course, the students should be able to			
1	Write technical documents and give oral presentations related to the work completed.		
2	Demonstrate the ability to collaborate with others as they work on intellectual projects (reading, writing, speaking, researching...).		
3	Explain the role of self-efficacy, personal goals, and motivation in improving academic life		
4	Describe the behaviours and characteristics of an effective learner		
5	Gain knowledge of fast and rapidly changing by self learning		
6	Develop the interpersonal skills, soft skills and creativity.		
Course Outcome	Semester VIII Sem	(Subject Code)Subject Name (B18EC44) PROJECT PHASE - II	L: 3 T: 0 P: 16 C: 8
After the completion of this course, the students should be able to			
1	Demonstrate a sound technical knowledge of their selected project topic.		
2	Identify and summarize an appropriate list of literature review, analyze previous researchers' work and relate them to current project.		
3	Formulate clearly a work plan and procedures.		
4	Present the project outlining the approach and expected results using good oral and written presentation skills.		
5	Undertake problem identification, formulation and solution.		
6	Apply critical and creative thinking in the design of engineering projects not only limited to electronics and communication engineering domain but if possible to other interdisciplinary domains as well.		
7	Design and develop a functional product prototype while working in a team		
8	Demonstrate the knowledge, skills and attitudes of a professional engineer when working in a team or working as a team leader.		
9	Communicate with engineers and the community at large in written and oral forms.		
10	Consider the business context and commercial positioning of designed devices or systems		
Course Outcome	Semester VII or VIII Sem	Subject Code)Subject Name (B18EC36) DBMS (Open Elective)	L: 3 T: 0 P: 0 C: 3
1	Ability to understand the fundamental concepts of database management.		



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2	Ability to analyze database models & Entity Relationship models and to draw the E-R diagram for the given case study.		
3	Apply relational Database Theory, and be able to write relational algebra expressions for queries.		
4	Utilize the knowledge of basics of SQL and construct queries using SQL.		
5	Apply Normalization Process to construct the database. Explain Basic Issues of transaction processing		
Course Outcome	Semester VII or VIII Sem	Subject Code)Subject Name (B18ME36) POWER PLANT ENGINEERING (Open Elective)	L: 3 T: 0 P: 0 C: 3
1	Understand the layout of power generation units for different energy sectors.		
2	Identify different subsystem and systems of power generation sector.		
3	Compare existing and emerging alternative energy sources		
4	Analyze the opportunities in contributing towards the solving of energy crisis.		
5	Discuss general arrangement of power distribution.		
Course Outcome	Semester VII or VIII Sem	Subject Code)Subject Name (B18CE53) DISASTER MANAGEMENT (Open Elective)	L: 3 T: 0 P: 0 C: 3
1	Understand different types of disaster and its triggering features		
2	Understand and analyze hydrological disaster		
3	Understand and develop models for geological disaster		
4	Understand the coastal hazard and shore defense structures		
5	Capable of preparing vulnerability mapping and risk assessment and developing Emergency Management System.		
Course Outcome	Semester VII or VIII Sem	Subject Code)Subject Name (B18CS33) CLOUD COMPUTING (Open Elective)	L: 3 T: 0 P: 0 C: 3
1	Understand the main concepts, key technologies of virtualization		
2	Describe the architecture and infrastructure of cloud computing with all services of cloud and deployment models.		
3	Analyze the issues of cloud computing like cloud security		
4	Identify problems, analyze various cloud computing solutions using python		
Course Outcome	Semester VII or VIII Sem	Subject Code)Subject Name (B18MB03) ENTREPRENEURSHIP DEVELOPMENT (Open Elective)	L: 3 T: 0 P: 0 C: 3
1	By the end of this course the students should be able to understand the mindset of the entrepreneurs, identify ventures for launching, develop an idea on the legal framework and also understand strategic perspectives in entrepreneurship		
Course Outcome	Semester VII or VIII Sem	Subject Code)Subject Name	L: 3 T: 0 P: 0 C: 3



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(B18CE52) AIR POLLUTION AND CONTROL (Open Elective)			
1	An understanding of the nature and characteristics of air pollutants, noise pollution and basic concepts of air quality management		
2	Ability to identify, formulate and solve air and noise pollution problems		
3	Ability to design stacks and particulate air pollution control devices to meet applicable standards.		
4	Ability to select control equipments		
5	Ability to ensure quality, control and preventive measures.		
Course Outcome	Semester VII or VIII Sem	Subject Code)Subject Name (B18ME38) ROBOTICS (Open Elective)	C:3 L: 3 T: 0 P: 0
1	Apply the knowledge of robotics in real time human life applications.		
2	Analyse the concept of CAD/CAM and automation to the robotics.		
3	Compare knowledge of robot applications in manufacturing like, material handling, loading and unloading etc.		
4	Experiment the robotics to the spot and continuous arc welding and spray painting.		
5	Relate the Robot Application in Manufacturing.		
Course Outcome	Semester VII or VIII Sem	Subject Code)Subject Name (B18EE52) POWER ELECTRONICS AND DRIVES (Open Elective)	L: 3 T: 0 P: 0 C: 3
1	Understand the fundamentals related to industrial drives.		
2	Analyze the operation of converter fed dc motors and four quadrant operations of dc motors using dual converters		
3	Describe the chopper fed dc motors in various quadrants of operation.		
4	Differentiate the stator side control and rotor side control of three phase induction motor and understand the speed control of single phase induction motor		
5	Explain the speed control mechanism of synchronous motors.		
Course Outcome	Semester VII or VIII Sem	Subject Code)Subject Name (B18EE51) INDUSTRIAL ELECTRONICS	L: 3 T: 0 P: 0 C: 3
1	Understand the differences between signal level and power level devices		
2	Analyse phase-controlled rectifier circuits		
3	Analyse the operation of AC-AC voltage regulators.		
4	Analyse the operation of DC-DC choppers.		
5	Analyse the operation of DC-AC converters		
Course Outcome	Semester VII or VIII Sem	Subject Code)Subject Name (B18CS17) MACHINE LEARNING (Open Elective)	L: 3 T: 0 P: 0 C: 3
1	Discuss different application on Machine Learning problems		
2	Describe various algorithms on Machine Learning mentioning its strengths and weaknesses.		
3	Illustrate the basic theory focused on Machine Learning.		



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4	Improve the performance of Machine Learning algorithms with different parameters.
5	Analyze current research papers.
6	Understand the latest issues raised by current researchers.