



Viswambhara Educational Society

# VAAGDEVI COLLEGE OF ENGINEERING

UGC-Autonomous

Department of Electronics and Communication Engineering

## Course Outcomes for B.Tech – ECE-R15 for the academic year 2015-16 onwards

Course Outcome	Year/Semester I/I Sem	Subject Name (Subject Code)	L: 4 T: 0 P: 0 C: 4
<b>After the completion of this course, the students should be able to</b>			
1		MATHEMATICS-I (A9001)	
1		Identify order and linearity of differential equation for classical problems.	
2		Develop different models for first order and higher order differential equations manually and technological based methods.	
3		Judge the consequences and geometrical approach to the mean value theorems and engineering applications to mathematical problems.	
4		Formulate, test different geometries using integral form to compute areas and volumes.	
5		Deduce general solution for initial and boundary value problems using Laplace transform technique and developing advanced aspects in Laplace transform, Adopt Laplace transform techniques to solve second order ordinary differential equations	
Course Outcome	Year / semester I/I Sem	Subject Name (Subject Code)	L: 4 T: 0 P: 0 C: 4
		PROBLEM SOLVING & COMPUTER PROGRAMMING(A9501)	
<b>After the completion of this course, the students should be able to</b>			
1		Understand how problems are posed and how they can be analyzed for obtaining solutions.	
2		Learn of sequencing, branching, looping and decision making statements to solve scientific and engineering problems.	



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3	Implement different operations on arrays and Pointers and creating and using of functions to solve problems.		
4	Exercise user defined data types such as structures and union.		
5	Design and implement different types of file structures using standard		
<b>Course Outcome</b>	<b>Year / semester I/I Sem</b>	<b>Subject Name (Subject Code)</b> ENGLISH(A9012)	<b>L: 3 T: 0 P: 0 C: 3</b>
<b>After the completion of this course, the students should be able to</b>			
1	Equip the components of different forms of communication skills.		
2	Able to guess meanings of words from context and grasp the effective vocabulary.		
3	Recall the enrichment of comprehension and fluency will be adaptable.		
4	Gain confidence in using language in varied situations		
5	Develop and Communicate by stating main ideas relevantly and coherently in speaking & writing.		
<b>Course Outcome</b>	<b>Year / semester I/I Sem</b>	<b>Subject Name (Subject Code)</b> ENVIRONMENTAL STUDIES(A9014)	<b>L: 3 T: 0 P: 0 C: 2</b>
<b>After the completion of this course, the students should be able to</b>			
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.		



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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, and OD and estimate the micro organisms which cause contamination and can propose solutions.		
<b>Course Outcome</b>	<b>Year / semester I/I Sem</b>	<b>Subject Name (Subject Code)</b>  APPLIED PHYSICS(A9007)	<b>L: 4 T: 0 P: 0 C: 4</b>
<b>After the completion of this course, the students should be able to</b>			
1	Expertise statistical mechanics and quantum mechanics and apply for new innovations.		
2	Develop classical free electron theory of metals and its successes along with its drawbacks. Interpret to calculate number of charge carriers in a semi conductor.		
3	Compare dielectrics and magnetic materials along with their engineering applications.		
4	Compare different types of lasers, their construction and applications in engineering field.		
5	Understand fundamentals of optical fibers and apply their applications.		
<b>Course Outcome</b>	<b>Year / semester I/I Sem</b>	<b>Subject Name (Subject Code)</b>  PROBLEM SOLVING AND COMPUTER PROGRAMING LAB(A9502)	<b>L: 0 T: 0 P: 3 C: 2</b>
<b>After the completion of this course, the students should be able to</b>			
1	Perceive basic structure of the C Programming, declaration and usage of variables.		



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2	Exercise conditional and iterative statements to solve scientific and engineering problems.		
3	Implement different operations on arrays and creating and using of functions to solve problems.		
4	Exercise pointers, file structures to write C programs		
<b>Course Outcome</b>	<b>Year / semester I/I Sem</b>	<b>Subject Name (Subject Code)</b> APPLIED PHYSICS LAB(A9008)	<b>L: 0 T: 0 P: 3 C: 2</b>
<b>After the completion of this course, the students should be able to</b>			
1	To relate principles with applications of CR, LCR, Circuits.		
2	Enlighten the student about modern equipment like solar cell, optical fiber etc.,		
3	Have the exposure to these experiments, and the student can compare the theory and correlate with experiment.		
4	Meliorate the knowledge of Lasers, & Light properties.		
<b>Course Outcome</b>	<b>Year / semester I/I Sem</b>	<b>Subject Name (Subject Code)</b> ENGLISH LANGUAGE COMMUNICATIONS SKILLS LAB(A9013)	<b>L: 0 T: 0 P: 3 C: 2</b>
<b>After the completion of this course, the students should be able to</b>			
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.		



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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.		
<b>Course Outcome</b>	<b>Year / semester I/II Sem</b>	<b>Subject Name (Subject Code)</b> MATHEMATICS-II(A9002)	<b>L: 3 T: 1 P: 0 C: 4</b>
<b>After the completion of this course, the students should be able to</b>			
1	Find rank of the matrix by solve system of simultaneous linear system equations.		
2	Find Eigen values and Eigen vectors and analyze the properties of matrix.		
3	Find Fourier Series and Fourier Transforms. Apply Fourier Series and Fourier Transforms con interpret in respective engineering fields.		
4	Evaluate physical quantities involving in engineering fields related to vector valued functions. Categorize the basic properties of vector valued functions and able to solve line, surface and volume integration.		
5	Apply a range of techniques to find solutions from standard partial differential equations to diverse situations in Physics, Engineering and other Mathematical contents.		
<b>Course Outcome</b>	<b>Year / semester I/II Sem</b>	<b>Subject Name (Subject Code)</b> ELECTRICAL CIRCUITS(A9202)	<b>L: 3 T: 1 P: 0 C: 4</b>
<b>After the completion of this course, the students should be able to</b>			
1	Learn basics of electrical circuits such as laws, transformation and network reduction techniques.		



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2	Understand various network theorems and its applications in electrical circuits.
3	Analyze the complex electrical circuits using Two port networks.
4	Design filters and attenuators with the help of electrical circuits.
5	Understand various RL, RC, RLC circuits(series and parallel) for DC and AC

Course Outcome	Year / semester I/II Sem	Subject Name (Subject Code)	L: 4 T: 0 P: 0 C: 4
		ELECTRONIC DEVICES AND CIRCUITS(A9401)	

**After the completion of this course, the students should be able to**

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	Year / semester I/II Sem	Subject Name (Subject Code)	L: 3 T: 0 P: 0 C: 3
		ENGINEERING CHEMISTRY(A9011)	

**After the completion of this course, the students should be able to**

1	Design polymeric engineering materials.
2	Construct batteries and classify different electronics and electrical like cells. electrodes, e. t.



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	c...help them to construct different electrical/ electronic part.		
3	Examine which type of impurities is present in water, specification of drinking water.		
4	Apply phase rule and adsorption to construct the materials by analyzing their compositions.		
5	Explain the corrosion behavior of metals/ activity of metals.		
<b>Course Outcome</b>	<b>Year / semester I/II Sem</b>	<b>Subject Name (Subject Code)</b> ENGINEERING GRAPHICS(A9303)	<b>L: 2 T: 0 P: 4 C: 4</b>
<b>After the completion of this course, the students should be able to</b>			
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.		
6	Know the applications of this knowledge in production of machine parts.		
<b>Course Outcome</b>	<b>Year / semester I/II Sem</b>	<b>Subject Name (Subject Code)</b> COMPUTATIONAL MATHEMATICS(A9004)	<b>L: 2 T: 0 P: 0 C: 2</b>
<b>After the completion of this course, the students should be able to</b>			
1	Make use of programmes to find numerical solutions.		



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2	Develop interpolation techniques.		
3	Develop fitting of curves through the given data by software.		
4	Find the iterations for different numerical integration problems.		
<b>Course Outcome</b>	<b>Year / semester I/II Sem</b>	<b>Subject Name (Subject Code)</b> BASIC ELECTRONICS LAB(A9402)	<b>L: 0 T: 0 P: 3 C: 2</b>
<b>After the completion of this course, the students should be able to</b>			
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	Make use of different theorems to analyze the circuits.		
<b>Course Outcome</b>	<b>Year / semester I/II Sem</b>	<b>Subject Name (Subject Code)</b> ENGINEERING WORKSHOP & IT WORKSHOP(A9307)	<b>L: 0 T: 0 P: 3 C: 2</b>
<b>After the completion of this course, the students should be able to</b>			
1	Know the usage of various tools and their application in carpentry, tin smithy.		
2	Know the usage of various tools and their application in black smithy, foundry, welding and		





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	house wiring		
3	Make lap joint and dove tail joint in carpentry.		
4	Make scoop, funnel and tray like items in tin smithy		
<b>Course Outcome</b>	<b>Year / semester II/I Sem</b>	<b>Subject Name (Subject Code)</b> MATHEMATICS-III(A9003)	<b>L: 3 T: 1 P: 0 C: 3</b>
<b>After the completion of this course, the students should be able to</b>			
1	Illustrate to explain the Fundamental concepts of complex analysis by analyzing their role in modern Mathematics and Applied contents.		
2	Classify what are trigonometric functions and algebraic functions and able to transform the trigonometric functions in to the algebraic functions		
3	Study the complex variables and predict to identify ordinary point, singular point and regular point for the given ordinary differential equations. Explain the residue concepts and utilize its relation to express in terms of Taylor's and Laurent's series. Plan to calculate very complicated Integrals through the use of Residue Theorem.		
4	Understand the concept of translation, magnification and rotation. Transformation from z-plane to w-plane in conformal mapping		
5	Understand Z-Transforms to solve the particular solution of the differential equation without finding the General Solution and are able to solve the applications of differential equations with boundary and initial conditions.		
<b>Course Outcome</b>	<b>Year / semester II/I Sem</b>	<b>Subject Name (Subject Code)</b>	<b>L: 4 T: 0 P: 0 C: 4</b>



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		<b>SIGNALS AND SYSTEMS(A9453)</b>	
<b>After the completion of this course, the students should be able to</b>			
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.	Analyze systems based on their properties and determine the response of LSI system using convolution.		
4.	Apply the Laplace transform and Fourier transform for analyze of continuous-time and discrete-time signals and systems.		
5.	Select and combine the necessary Laplace transform techniques to solve ordinary differential equations.		
<b>Course Outcome</b>	<b>Year / semester II/I Sem</b>	<b>Subject Name (Subject Code)</b>  ELECTRONIC CIRCUIT ANALYSIS (A9404)	<b>L: 4 T: 0 P: 0 C: 4</b>
<b>After the completion of this course, the students should be able to</b>			
1.	Construct and analyze the Low frequency model of transistor and evaluate the h-parameter.		
2.	Analyze the single and multi stage amplifiers in high frequency regions.		



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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.		
<b>Course Outcome</b>	<b>Year / semester II/I Sem</b>	<b>Subject Name (Subject Code)</b> DATA STRUCTURES THROUGH C++(A9506)	<b>L: 4 T: 0 P: 0 C: 4</b>
<b>After the completion of this course, the students should be able to</b>			
1	Find the difference between structured programming and object oriented programming language and understanding the features of C++ supporting object oriented programming.		
2	Explain and apply the major object oriented concepts to implement object oriented programs in C++.		
3	Build the basic knowledge to handle operations like insertions, searching, deletions and traversing mechanisms in linear Data Structures.		
4	Examine with advanced Data Structure such as hash tables and priority queue Data Structures.		
5	Have knowledge on trees, balanced trees, graphs and developing C++ code for non-linear Data Structures.		



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Course Outcome	Year / semester II/I Sem	Subject Name (Subject Code)	L: 3 T: 1 P: 0 C: 3
		ELECTRICAL TECHNOLOGY(A9209)	
<b>After the completion of this course, the students should be able to</b>			
1	Understand the concept of network topology.		
2	Illustrate the operation and concept of DC machines		
3	Analyze the magnetic circuits in series and parallel		
4	Illustrate single phase transformer and three phase induction motor.		
5	Construct the synchronous motor and single phase induction motor		
Course Outcome	Year / semester II/I Sem	Subject Name (Subject Code)	L: 0 T: 0 P: 3 C: 2
		ELECTRONIC CIRCUITS LAB(A9405)	
<b>After the completion of this course, the students should be able to</b>			
1	Understand the concept of multistage amplifiers, analysis of multistage amplifier and Construct 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.		



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Course Outcome	Year / semester II/I Sem	Subject Name (Subject Code)	L: 0 T: 0 P: 3 C: 2
		DATA STRUCTURES THROUGH C++ LAB(A9507)	
<b>After the completion of this course, the students should be able to</b>			
1	Design and implement object oriented programming concepts.		
2	Select the appropriate data structure for given problem.		
3	Illustrate operations like searching, insertion, deletion and traversing mechanism on various Data Structures.		
4	Have practical knowledge on the applications of Data Structures.		
5	Understand and apply hashing techniques.		
Course Outcome	Year / semester II/I Sem	Subject Name (Subject Code)	L: 0 T: 0 P: 3 C: 2
		Electronic Simulation Lab (A9406)	
<b>After the completion of this course, the students should be able to</b>			
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		



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	relevance of noise in signal procession applications.		
4	Design and develop functional simulation, timing analysis using MATLAB.		
<b>Course Outcome</b>	<b>Year / semester</b> II/II Sem	<b>Subject Name (Subject Code)</b> SWITCHING THEORY AND LOGIC DESIGN (A9407)	<b>L: 3 T: 0 P: 0 C: 3</b>
<b>After the completion of this course, the students should be able to</b>			
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.		
<b>Course Outcome</b>	<b>Year / semester</b> II/II Sem	<b>Subject Name (Subject Code)</b> PULSE AND DIGITAL CIRCUITS(A9408)	<b>L: 4 T: 0 P: 0 C: 4</b>
<b>After the completion of this course, the students should be able to</b>			
1.	Design the circuits for generating desired wave shapes (non-sinusoidal) for different applications like computers, control systems and counting and timing systems.		



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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		
<b>Course Outcome</b>	<b>Year / semester</b> <b>II/II Sem</b>	<b>Subject Name (Subject Code)</b> <b>ELECTRO MAGNETIC THEORY AND TRANSMISSION LINES(A9409)</b>	<b>L: 4 T: 0 P: 0 C: 4</b>
<b>After the completion of this course, the students should be able to</b>			
1.	Explain and illustrate the concepts of electrostatics.		
2.	Elaborate magneto static fields and Maxwell's equations.		
3.	Implement applications of Maxwell's equations in plane waves and their propagation in different media.		
4.	Apply power concept associated with waves. The knowledge is used to study the behavior of transmission lines & their parameters.		
5.	Determine the various parameters such as VSWR, Impedances of transmission lines		
<b>Course Outcome</b>	<b>Year / semester</b> <b>II/II Sem</b>	<b>Subject Name (Subject Code)</b> <b>PROBABILITY AND STOCHASTIC</b>	<b>L: 3 T: 0 P: 0 C: 3</b>



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		PROCESS(A9410)	
<b>After the completion of this course, the students should be able to</b>			
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.	Apply the knowledge of spectral density to calculate the impulse response of the system.		
<b>Course Outcome</b>	<b>Year / semester</b> II/II Sem	<b>Subject Name (Subject Code)</b> ANALOG COMMUNICATIONS(A9411)	<b>L: 4 T: 0 P: 0 C: 4</b>
<b>After the completion of this course, the students should be able to</b>			
1.	Explain the generation and detection of AM and DSBSC modulation schemes.		
2.	Understand various types of SSB transmission and reception.		
3.	Analyze different methods of generation and detection of Frequency modulation		
4.	Evaluate the performance of analog communications in the presence of noise		
5.	Analyze and allocate performance objectives to components of an analog communication systems		
<b>Course Outcome</b>	<b>Year / semester</b> II/II Sem	<b>Subject Name (Subject Code)</b> GENDERSENSITIZATION A9019) (Mandatory Elective)	<b>L: 2 T: 0 P: 0 C: 0</b>
<b>After the completion of this course, the students should be able to</b>			
1	Define the need and importance of women empowerment.		





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2	Extend the levels of understanding and classification of gender disparities.		
3	Identify the need of equal distribution of work in all the sector irrespective of gender.		
4	Construct the emergency needs of saving girl child.		
5	Improves thinking levels to find solution to the missing women and bring realization in the society.		
<b>Course Outcome</b>	<b>Year / semester II/II Sem</b>	<b>Subject Name (Subject Code)</b> PULSE AND DIGITAL CIRCUITS LAB(A9412)	<b>L: 0 T: 0 P: 3 C: 2</b>
<b>After the completion of this course, the students should be able to</b>			
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 schmitttrigger circuit.		
4	Design and analyze UJT relaxation oscillator and boot-strap sweep circuits		
<b>Course Outcome</b>	<b>Year / semester II/II Sem</b>	<b>Subject Name (Subject Code)</b> ANALOG COMMUNICATIONS LAB (A9413)	<b>L: 0 T: 0 P: 3 C: 2</b>



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After the completion of this course, the students should be able to			
1	Comprehend the fundamentals in explain the functionality of modulation and demodulation environment		
2	Analyze and simulate the concepts of AM, FM and AM-Demodulation, FM-Demodulation process in communication		
3	Interpret with various angle modulation and demodulation systems		
4	Create the writing and simulation environments in PWM, PPM, Mixer and ring modulation		
<b>Course Outcome</b>	<b>Year / semester</b> <b>II/II Sem</b>	<b>Subject Name (Subject Code)</b> <b>ELECTRICAL TECHNOLOGY LAB (A9210)</b>	<b>L: 0 T: 0 P: 3 C: 2</b>
After the completion of this course, the students should be able to			
1	Verify network theorems.		
2	Select range of apparatus based on the ratings of DC machines.		
3	Determine characteristics of DC machines by analyzing test results.		
4	Study speed control methods for DC machines		
<b>Course Outcome</b>	<b>Year / semester</b> <b>III/I Sem</b>	<b>Subject Name (Subject Code)</b> <b>LINEAR &amp; DIGITAL IC APPLICATIONS (A9414)</b>	<b>L: 4 T: 0 P: 0 C: 4</b>
After the completion of this course, the students should be able to			
1	Define operational amplifiers with linear integrated circuits.		
2	Explain different families of digital integrated circuits and their characteristics.		



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3	Develop skills to design various waveform generation circuits and circuits to implement some special function ICs.		
4	Compare the working of multivibrators using special application of IC 555 and		
5	Analyze circuits for inverting and non inverting amplifiers, diff. Amps, and Evaluate the ADC and DAC using OPAMP.		
<b>Course Outcome</b>	<b>Year / semester III/I Sem</b>	<b>Subject Name (Subject Code) ANTENNAS AND WAVE PROPAGATION (A9415)</b>	<b>L: 3 T: 0 P: 0 C: 3</b>
<b>After the completion of this course, the students should be able to</b>			
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.		
<b>Course Outcome</b>	<b>Year / semester III/I Sem</b>	<b>Subject Name (Subject Code) DIGITAL COMMUNICATIONS(A9416)</b>	<b>L: 3T: 1 P: 0 C: 3</b>
<b>After the completion of this course, the students should be able to</b>			
1	Define basic components of digital communication systems.		
2	Design optimum receivers for digital modulation techniques.		
3	Demonstrate the understanding of various digital modulation and demodulation techniques.		
4	Explain different error detection and error correction codes like block codes, cyclic codes and convolution codes.		
5	Analyze the performance of spread spectrum, PN codes in jamming, noise etc and		



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	various applications of different modulation techniques.		
<b>Course Outcome</b>	<b>Year / semester</b> <b>III/I Sem</b>	<b>Subject Name (Subject Code)</b> <b>LINEAR CONTROL SYSTEMS(A9249)</b> <b>(Professional Elective-I)</b>	<b>L: 3 T: 0 P: 0 C: 3</b>
<b>After the completion of this course, the students should be able to</b>			
1	Analyse Open loop and closed loop systems, concept of feedback in control Systems.		
2	Determine Mathematical modelling and transfer function derivations of translational and rotational systems		
3	Apply Transfer function representation through block diagram algebra and signal flow graphs		
4	Develop Time response analysis of different ordered systems through their characteristic equation and time-domain specifications		
5	Explain Stability analysis of control systems in s-domain through R-H criteria and root-locus techniques, with which he/she can be able to apply the above conceptual things to real world electrical and Electronic problems and applications.		
<b>Course Outcome</b>	<b>Year / semester</b> <b>III/I Sem</b>	<b>Subject Name (Subject Code)</b> <b>ELECTRONIC MEASUREMENTS AND INSTRUMENTATION(A9418)</b> <b>(Professional Elective-I)</b>	<b>L: 3 T: 0 P: 0 C: 3</b>
<b>After the completion of this course, the students should be able to</b>			
1	Determine the fundamental concepts and principles of instrumentation.		
2	Explain the operations of the various instruments required in measurements.		
3	Apply the measurement techniques for different types of tests.		
4	To select specific instrument for specific measurement function.		
5	Learners will apply knowledge of different oscilloscopes like CRO, DSO and different AC and DC bridges for measurement		
<b>Course Outcome</b>	<b>Year / semester</b> <b>III/I Sem</b>	<b>Subject Name (Subject Code)</b> <b>OOPS THROUGH JAVA(A9512)</b> <b>(Professional Elective-I)</b>	<b>L: 3 T: 0 P: 0 C: 3</b>



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<b>After the completion of this course, the students should be able to</b>			
1	Describe the concepts of Java Programming language		
2	Demonstrate the concepts of Polymorphism and Inheritance		
3	Develop robust applications using Exception handling.		
4	Develop multithreaded applications with synchronization.		
5	Design GUI based applications and Applets for web applications.		
<b>Course Outcome</b>	<b>Year / semester III/I Sem</b>	<b>Subject Name (Subject Code) COMPUTER ORGANIZATION (A9417)</b>	<b>L: 4 T: 0 P: 0 C: 4</b>
<b>After the completion of this course, the students should be able to</b>			
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.		
<b>Course Outcome</b>	<b>Year / semester III/I Sem</b>	<b>Subject Name (Subject Code) MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS (A9621)</b>	<b>L: 3 T: 1 P: 0 C: 3</b>
<b>After the completion of this course, the students should be able to</b>			
1	Understand the nature, scope and importance of Managerial Economics.		
2	Evaluate methods for forecasting demand, and analyze demand and how elasticity of demand is used for pricing decisions.		
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		



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	business organization.		
5	Analyze how capital budgeting techniques are used for investment decisions and interpret financial statements uses Ratio analysis technique.		
<b>Course Outcome</b>	<b>Year / semester</b> III/I Sem	<b>Subject Name (Subject Code)</b> PERSONALITY DEVELOPMENT AND SOFT SKILLS (A9020) (Mandatory Elective-II)	<b>L: 2 T: 0 P: 0 C: 0</b>
<b>After the completion of this course, the students should be able to</b>			
1	Understand one's own personality and enhances successful living		
2	Get ideas on physical, emotional, social, cognitive, moral to achieve the objectives of life		
3	Identify the individual skill and learn the balanced living		
4	Develop communication skills, integrate class room learning with real life behaviour		
<b>Course Outcome</b>	<b>Year / semester</b> III/I Sem	<b>Subject Name (Subject Code)</b> IC APPLICATIONS LAB(A9419)	<b>L: 0 T: 0 P: 3 C: 2</b>
<b>After the completion of this course, the students should be able to</b>			
1	Design circuits using operational amplifiers for various applications practically.		
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		
<b>Course Outcome</b>	<b>Year / semester</b> III/I Sem	<b>Subject Name (Subject Code)</b> DIGITAL COMMUNICATIONS LAB(A9420)	<b>L: 0 T: 0 P: 3 C: 2</b>
<b>After the completion of this course, the students should be able to</b>			
1	Assess different digital modulation and demodulation techniques.		
2	Evaluate the bandwidth and transmission power by analyzing time and frequency spectra of signal under various modulation schemes.		
3	Apply suitable modulation schemes and coding techniques for various applications.		
4	Analyze and Implement Analog to digital converters like PCM and DM		
<b>Course Outcome</b>	<b>Year / semester</b> III/II Sem	<b>Subject Name (Subject Code)</b> MICROPROCESSORS AND MICROCONTROLLERS (A9421)	<b>L: 4 T: 0 P: 0 C: 4</b>
<b>After the completion of this course, the students should be able to</b>			



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1	Illustrate the internal organization of popular microprocessors/microcontrollers.	8086/8051
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.	
<b>Course Outcome</b>	<b>Year / semester</b> <b>III/II Sem</b>	<b>Subject Name (Subject Code)</b> <b>DIGITAL SYSTEM DESIGN THROUGH VERILOG (A9456)</b>
<b>L: 4 T: 0 P: 0 C: 4</b>		
<b>After the completion of this course, the students should be able to</b>		
1	Describe Verilog hardware description languages(HDL) , standard cell libraries and FPGAs	
2	Design digital circuits.	
3	Asses Behavioural models of digital circuits.	
4	Estimate Register Transfer Level (RTL) models of Digital Circuits, Interpret RTL models on FPGAs and Testing and Verification	
5	Identify Behavioural and RTL models and Analyze RTL models to standard cell libraries and FPGAs	
<b>Course Outcome</b>	<b>Year / semester</b> <b>III/II Sem</b>	<b>Subject Name (Subject Code)</b> <b>DIGITAL SIGNAL PROCESSING (A9423)</b>
<b>L: 4 T: 0 P: 0 C: 4</b>		
<b>After the completion of this course, the students should be able to</b>		
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.	



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<b>Course Outcome</b>	<b>Year / semester</b> III/II Sem	<b>Subject Name (Subject Code)</b> OPERATING SYSTEMS (A9518) (Open Elective-II)	<b>L: 3 T: 0 P: 0 C: 3</b>
<b>After the completion of this course, the students should be able to</b>			
1	Compare various Operating Systems architectures, IO structures, Network Structure		
2	Analyze the virtual memory, paging and memory allocation techniques for various applications.		
3	Apply Deadlock prevention and Deadlock Detection algorithms and Perceive the working of an operating system as a File manager, I/O manager, Process manager.		
4	Understand the overview of Disk Storage Structure.		
5	Analyze assess access controls to protect files.		
<b>Course Outcome</b>	<b>Year / semester</b> III/II Sem	<b>Subject Name (Subject Code)</b> DATACOMMUNICATIONS(A9457) (Professional Elective-II)	<b>L: 3 T: 0 P: 0 C: 3</b>
<b>After the completion of this course, the students should be able to</b>			
1	Examine the basic communication systems and Evaluate alternative models of communication system design		
2	Adapt the knowledge of various analog and digital modulation and demodulation techniques.		
3	Explain the various multiplexing schemes and Data communication protocols.		
4	To define the standards and mechanisms of television systems.		
5	Illustrate the performance of error detection and error correction codes for digital data transmission.		
<b>Course Outcome</b>	<b>Year / semester</b> III/II Sem	<b>Subject Name (Subject Code)</b> COMPUTER NETWORKS(A9566) (Professional Elective-II)	<b>L: 3 T: 0 P: 0 C: 3</b>
<b>After the completion of this course, the students should be able to</b>			
1	Learn the basic concepts of OSI and TCP IP layers.		
2	Compare and contrast the address formats		
3	Design and implement data link or network layer protocols within a simulated networking environment and Demonstrate the contemporary issues in computer networks.		
4	Analyze the features and Operations of TCP/UDP, FTP, HTTP, SMTP,SNMP etc.		





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5	Categorize the hardware and software commonly used in data communications and networking.		
<b>Course Outcome</b>	<b>Year / semester</b> <b>III/II Sem</b>	<b>Subject Name (Subject Code)</b> <b>SATELLITE COMMUNICATIONS(A9425)</b> <b>(Professional Elective-III)</b>	<b>L: 3 T: 0 P: 0 C: 3</b>
<b>After the completion of this course, the students should be able to</b>			
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.		
<b>Course Outcome</b>	<b>Year / semester</b> <b>III/II Sem</b>	<b>Subject Name (Subject Code)</b> <b>TELECOMMUNICATION SWITCHING SYSTEMS AND NETWORKS(A9424)</b> <b>(Professional Elective-III)</b>	<b>L: 3 T: 0 P: 0 C: 3</b>
<b>After the completion of this course, the students should be able to</b>			
1	Understand the main concepts of telecommunicating network design and Relate adequate knowledge about telecommunication network		
2	Analyze and evaluate fundamental telecommunication traffic models.		
3	Conclude themselves through the evolution of switching systems from manual and electromechanical systems to stored-program-controlled digital systems.		
4	Apply the knowledge of basic modern signalling system.		
5	Examine the concept of packet switching.		
<b>Course Outcome</b>	<b>Year / semester</b> <b>III/II Sem</b>	<b>Subject Name (Subject Code)</b> <b>NEURAL NETWORKS AND APPLICATNS(A9463)</b> <b>(Professional Elective-III)</b>	<b>L: 3 T: 0 P: 0 C: 3</b>



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<b>After the completion of this course, the students should be able to</b>			
1	demonstrate the concepts of set theory		
2	Relate adequate knowledge about feedback networks.		
3	Analyze the concept of networks involved in various systems and Gain the Original knowledge about neural networks		
4	Appraise the survey of attractive applications of artificial neural networks.		
5	Assume the practical approach for using artificial neural networks in various technical, organizational and economic applications		
<b>Course Outcome</b>	<b>Year / semester III/II Sem</b>	<b>Subject Name (Subject Code) LOGICAL REASONING AND QUALITATIVE ANALYSIS(A9018) (Mandatory Elective-III)</b>	<b>L: 2 T: 0 P: 0 C: 0</b>
<b>After the completion of this course, the students should be able to</b>			
1	Improve logical thinking with general applications using mathematical concepts like sequences, series, number theory and probability		
2	Analyze data interpretation		
3	Improve mathematical skills in various general aspects like coding and decoding, puzzle solving etc.,		
4	Improve in academic and competitive levels in tackling real world problems		
<b>Course Outcome</b>	<b>Year / semester III/II Sem</b>	<b>Subject Name (Subject Code) TECHNICAL COMMUNICATIONS SKILLS LAB(A9024)</b>	<b>L: 0 T: 0 P: 3 C: 2</b>
<b>After the completion of this course, the students should be able to</b>			
1	Develop effective and appropriate vocabulary to get focused in the new patterns of Learning.		
2	Infer flair for writing and felicity in written expression.		
3	Enhance job prospects with basic facts and concepts on the new patterns.		
4	Formulate effective speaking abilities to improve quality in their speaking by evaluating.		
1	Develop effective and appropriate vocabulary to get focused in the new patterns of		



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	Learning.		
<b>Course Outcome</b>	<b>Year / semester</b> III/II Sem	<b>Subject Name (Subject Code)</b> MICROPROCESSORS AND MICROCONTROLLERS LAB(A9428)	<b>L: 0 T: 0 P: 3 C: 2</b>
<b>After the completion of this course, the students should be able to</b>			
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.		
<b>Course Outcome</b>	<b>Year / semester</b> III/II Sem	<b>Subject Name (Subject Code)</b> DIGITAL SIGNAL PROCESSING LAB(A9429)	<b>L: 0 T: 0 P: 3 C: 2</b>
<b>After the completion of this course, the students should be able to</b>			
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.		
<b>Course Outcome</b>	<b>Year / semester</b> IV/I Sem	<b>Subject Name (Subject Code)</b> VLSI DESIGN (A9422)	<b>L: 3 T: 1 P: 0 C: 3</b>
1	Understand IC technology and basic electrical properties of MOS and BiCMOS.		
2	Discuss the design process of VLSI circuits		
3	Develop and design the gate level circuits		
4	Gain the knowledge to design data path subsystems like Adders, Shifters, ALUs etc.		



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5	Illustrate different programmable logic devices and CMOS testing.		
<b>Course Outcome</b>	<b>Year / semester IV/I Sem</b>	<b>Subject Name (Subject Code) MICROWAVE ENGINEERING (A9431)</b>	<b>L: 3 T: 1 P: 0 C: 3</b>
<b>After the completion of this course, the students should be able to</b>			
1.	Explain 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.		
<b>Course Outcome</b>	<b>Year / semester IV/I Sem</b>	<b>Subject Name (Subject Code) DIGITAL IMAGE PROCESSING Professional Elective-IV(A9433)</b>	<b>L: 3 T: 0 P: 0 C: 3</b>
<b>After the completion of this course, the students should be able to</b>			
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		



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	processing.		
5	Analyze the different image compression techniques.		
<b>Course Outcome</b>	<b>Year / semester IV/I Sem</b>	<b>Subject Name (Subject Code) BIOMEDICAL INSTRUMENTATION Professional Elective-IV(A9426)</b>	<b>L: 3 T: 0 P: 0 C: 3</b>
<b>After the completion of this course, the students should be able to</b>			
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.		
<b>Course Outcome</b>	<b>Year / semester IV/I Sem</b>	<b>Subject Name (Subject Code) FPGA ARCHITECTURE &amp; APPLICATIONS Professional elective-IV (A9427)</b>	<b>L: 3 T: 0 P: 0 C: 3</b>
<b>After the completion of this course, the students should be able to</b>			
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.		
<b>Course Outcome</b>	<b>Year / semester IV/I Sem</b>	<b>Subject Name (Subject Code) DIGITAL SIGNAL PROCESSORS AND ARCHITECTURES Professional elective-V (A9432)</b>	<b>L: 3 T: 0 P: 0 C: 3</b>
<b>After the completion of this course, the students should be able to</b>			
1	Distinguish between the architectural features of General purpose processors and DSP processors.		



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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.		
<b>Course Outcome</b>	<b>Year / semester IV/I Sem</b>	<b>Subject Name (Subject Code) RADAR SYSTEMS Professional elective-V (A9436)</b>	<b>L: 3 T: 0 P: 0 C: 3</b>
<b>After the completion of this course, the students should be able to</b>			
1	Illustrate the importance of radar fundamentals and analysis of the radar signals.		
2	Distinguish various radar transmitters and receivers.		
3	List the function of various radars like MT1, Doppler and tracking radars and their comparison.		
4	Summarize the importance of other communications systems with RADAR communications.		
5	Elaborate the Radar systems under standard NOISE Scenario and design simple Radar system with available discrete components.		
<b>Course Outcome</b>	<b>Year / semester IV/I Sem</b>	<b>Subject Name (Subject Code) EMBEDDED SYSTEMS Professional elective-V (A9430)</b>	<b>L: 3 T: 0 P: 0 C: 3</b>
<b>After the completion of this course, the students should be able to</b>			
1	Understand the difference between Embedded system and General computing systems and their characteristics.		
2	Explain the requirement of memories, sensors and actuators to develop embedded system.		
3	Identify the importance of embedded firmware design approaches.		
4	Elaborate the operating systems concepts, types and choosing of RTOS.		



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5	Develop the required communication and synchronization techniques for An Embedded system.		
<b>Course Outcome</b>	<b>Year / semester IV/I Sem</b>	<b>Subject Name (Subject Code) MICROWAVE ENGINEERING LAB (A9438)</b>	<b>L: 0 T: 0 P: 3 C: 2</b>
<b>After the completion of this course, the students should be able to</b>			
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.		
<b>Course Outcome</b>	<b>Year / semester IV/I Sem</b>	<b>Subject Name (Subject Code) VLSI &amp; ECAD LAB(A9439)</b>	<b>L: 0 T: 0 P: 3 C: 2</b>
<b>After the completion of this course, the students should be able to</b>			
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.		
<b>Course Outcome</b>	<b>Year / semester IV/I Sem</b>	<b>Subject Name (Subject Code) MINI PROJECT(A9440)</b>	<b>L: 0 T: 0 P: 3 C: 2</b>
<b>After the completion of this course, the students should be able to</b>			
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	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		



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	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		
<b>Course Outcome</b>	<b>Year / semester IV/II Sem</b>	<b>Subject Name (Subject Code) CELLULAR AND MOBILE COMMUNICATIONS Professional elective-VI(A9441)</b>	<b>L: 3 T: 0 P: 0 C: 3</b>
<b>After the completion of this course, the students should be able to</b>			
1	Estimate the impairments due to multi path fading channel.		
2	Explain an Importance of the fundamental techniques to overcome the different fading effects.		
3	Distinguish the co-channel and Non co-channel interference.		
4	Inspect cell coverage for signal and traffic, diversity techniques and mobile antennas.		
5	Relate and explain the functioning of frequency management, Channel assignment and types of handoff.		
<b>Course Outcome</b>	<b>Year / semester IV/II Sem</b>	<b>Subject Name (Subject Code) LOW POWER VLSI DESIGN Professional elective-VI(A9458)</b>	<b>L: 3 T: 0 P: 0 C: 3</b>
<b>After the completion of this course, the students should be able to</b>			
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.		
5	Demonstrate the fabrication process of integrated circuit using VTCMOS, MTCMOS.		
<b>Course Outcome</b>	<b>Year / semester IV/II Sem</b>	<b>Subject Name (Subject Code) WIRELESS COMMUNICATION NETWORKS Professional elective-VI(A9443)</b>	<b>L: 3 T: 0 P: 0 C: 3</b>
<b>After the completion of this course, the students should be able to</b>			





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1	Understand the principles of wireless communications and get an idea about fundamentals of wireless networking and cellular system design concepts.		
2	Discuss various multiple access schemes used in wireless communication.		
3	Analyze different wireless wide area networks and their performance.		
4	Demonstrate wireless local area networks and their specifications.		
5	Relate some of the existing and emerging wireless standards.		
<b>Course Outcome</b>	<b>Year / semester IV/II Sem</b>	<b>Subject Name (Subject Code) SEMINAR(A9444)</b>	<b>L: 0 T: 0 P: 3 C: 3</b>
<b>After the completion of this course, the students should be able to</b>			
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 behaviors 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.		
<b>Course Outcome</b>	<b>Year / semester IV/II Sem</b>	<b>Subject Name (Subject Code) COMPREHENSIVE VIVA VOCE(A9445)</b>	<b>L: 0 T: 0 P: 0 C: 3</b>
<b>After the completion of this course, the students should be able to</b>			
1	Confidently discuss the fundamental aspects of any engineering problem/situation related to electronics & communication engineering domain and give answers in dealing with them.		
2	Articulate knowledge on various fundamentals.		
3	Recalls to answer questions from all the courses of the semesters comprehensively		
4	Attain Oral Presentation skills by answering questions in precise manner		



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5	Attain Oral Presentation skills by answering questions in concise manner		
6	Prepare the students to face interview at the academic level		
<b>Course Outcome</b>	<b>Year / semester IV/II Sem</b>	<b>Subject Name (Subject Code) MAJOR PROJECT(A9446)</b>	<b>L: 0 T: 0 P: 15 C: 12</b>
<b>After the completion of this course, the students should be able to</b>			
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		
<b>Course Outcome</b>	<b>Year / semester IV/I Sem OR IV/II Sem</b>	<b>Subject Name (Subject Code) NANO TECHNOLOGY Open elective (A9023)</b>	<b>L: 3 T: 0 P: 0 C: 3</b>
<b>After the completion of this course, the students should be able to</b>			
1	Understand the fundamentals of Nanotechnology		
2	Identify the importance of different classes of Nano materials		
3	Develop an opinion on various synthesis and characterization techniques involved in Nanotechnology		



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4	Summarize the general scientific concepts required for technology, Apply the concepts in solving engineering problems,		
5	List the new developments in engineering and technology, and Get familiarized with the concepts, theories, and technological applications.		
<b>Course Outcome</b>	<b>Year / semester</b> <b>IV/I Sem</b> <b>OR</b> <b>IV/II Sem</b>	<b>Subject Name (Subject Code)</b> <b>PRINCIPLES OF COMMUNICATION SYSTEMS</b> <b>Open elective (A9455)</b>	<b>L: 3 T: 0 P: 0 C: 3</b>
<b>After the completion of this course, the students should be able to</b>			
1	Understand the concepts of spectral analysis and Random process.		
2	Develop the analog modulation systems of different types of FM, PM transmitters & Receivers.		
3	Design a Base Band Data Communication using sampling and Quantization Techniques.		
4	Gain the Knowledge of different Digital modulation techniques for digital transmission.		
5	Learn the fundamentals and concepts of spread spectrum communication.		
<b>Course Outcome</b>	<b>Year / semester</b> <b>IV/I Sem</b> <b>OR</b> <b>IV/II Sem</b>	<b>Subject Name (Subject Code)</b> <b>INTRODUCTION TO MICROCONTROLLER &amp; APPLICATIONS</b> <b>Open elective (A9459)</b>	<b>L: 3 T: 0 P: 0 C: 3</b>
<b>After the completion of this course, the students should be able to</b>			
1	Learn the internal organization of 8051 microcontrollers.		
2	Write software programs using different types of instructions.		
3	Develop the Real time control using interrupts and timers/counters.		
4	Gains knowledge of interfacing various devices with microcontroller and the external world.		
5	Understand the Real time operating systems required for microcontroller for real time applications.		
<b>Course Outcome</b>	<b>Year / semester</b> <b>IV/I Sem</b>	<b>Subject Name (Subject Code)</b> <b>INDUSTRIAL ELECTRONICS</b>	<b>L: 3 T: 0 P: 0 C: 3</b>



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	<b>OR</b> <b>IV/II Sem</b>	Open elective (A9460)	
<b>After the completion of this course, the students should be able to</b>			
1	Construct the V-I characteristics communication firing and protection of various power semiconductor devices.		
2	Explain R, RL, and RLE loads for different power inputs.		
3	Convert AC- to- DC and DC- to – AC power through 1-phase and 3-phase controlled rectifiers and dc- to- ac power through step-up and step down choppers.		
4	Explain different types of PWM techniques.		
5	Explain steady state and transient state analysis of the power converters.		
<b>Course Outcome</b>	<b>Year / semester</b> <b>IV/I Sem</b> <b>OR</b> <b>IV/II Sem</b>	<b>Subject Name (Subject Code)</b> <b>SENSOR AND NETWORKS</b> Open elective (A9461)	<b>L: 3 T: 0 P: 0 C: 3</b>
<b>After the completion of this course, the students should be able to</b>			
1	Gain the knowledge of wireless sensor networks.		
2	Discuss the architectures of various sensor networks.		
3	Understand the various protocols used for networking sensors.		
4	Develop the infrastructure establishment for wireless sensors networks.		
5	Learn the different tools for sensors networks.		
<b>Course Outcome</b>	<b>Year / semester</b> <b>IV/I Sem</b> <b>OR</b> <b>IV/II Sem</b>	<b>Subject Name (Subject Code)</b> <b>4G TECHNOLOGY</b> Open elective (A9462)	<b>L: 3 T: 0 P: 0 C: 3</b>
<b>After the completion of this course, the students should be able to</b>			
1	Demonstrate the design and functionality of 4G architecture.		
2	Discuss about the Physical Layer and Multiple Access.		
3	Outline wireless wide area networks and their performance for 4G.		
4	Form opinion on existing and emerging wireless standards.		



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5	Name and explain various multiple access schemes present in 4G technology
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