

DEPARTMENT OF ELECTRONICS

BSc PROGRAMME WITH HONOURS IN ELECTRONICS (CBCS) COURSE OUTCOME

COURSE CODE	COURSE TITLE	OBJECTIVE	COURSE OUTCOMES
ELECTRONICS-C-1	BASIC CIRCUIT THEORY AND NETWORK ANALYSIS	<ol style="list-style-type: none">1. Understand the basic circuit concepts and devices like resistors, capacitors and inductors.2. Perform AC and DC circuit analysis.3. Work with different theorems of network analysis.	<ol style="list-style-type: none">1. Acquire the foundation knowledge about voltage, current and passive devices.2. Analyse AC and DC circuits using available techniques.3. Analyse different types of networks using the standard network theorem.
ELECTRONICS-C-2	MATHEMATICS FOUNDATION FOR ELECTRONICS	<ol style="list-style-type: none">1. Acquire the mathematical skills and learn the techniques that are necessary to embark on the field of electronics.2. Identify, formulate and solve complex problems in mathematics.3. Gain the mathematical foundation, including differentiation and	<ol style="list-style-type: none">1. Apply concepts to do mathematical modelling and analysis of numerical methods.2. Develop their knowledge and skills for electronics, through a specialist pathway.3. Perform independent research to help define the frontiers of knowledge in electronics or related interdisciplinary areas.

		<p>integration, multi-variable calculus, linear algebra, differential equations, complex variables, probability and statistics etc. which will help in the study of the broad subject electronics in a much convenient way</p> <p>4. Apply this knowledge towards modelling and solution of problems in electronics with the help of advanced mathematics that this course provides.</p>	
ELECTRONICS-C-3	SEMICONDUCTOR DEVICES	<p>1. Learn the fundamental physics of the semiconductor materials and devices.</p> <p>2. Identify and characterize the semiconductor devices.</p> <p>3. Apply the semiconductor devices in various circuits.</p>	<p>1. Understand the basic principles and working of the semiconductor materials and devices.</p> <p>2. Characterize the device.</p> <p>3. Apply the knowledge of semiconductor devices in real life application.</p>
ELECTRONICS-C-IV	APPLIED PHYSICS	<p>1. Learn about the development of modern physics and the theoretical formation of quantum</p>	<p>1. Apply quantum mechanics to solve physical systems in different areas of science.</p>

		<p>mechanics.</p> <p>2. Learn about the applications of quantum mechanics in solving physical problems.</p> <p>3. Learn about the physics of material science by studying mechanical properties, thermal properties, elastic and magnetic properties of materials.</p>	<p>2. Know about the physical behaviour of materials.</p> <p>3. Learn how the scientific behaviours of materials can be used for human applications.</p>
ELECTRONICS-C-V	ELECTRONICS CIRCUITS	<p>1. Understand the various uses and applications of diodes and bipolar junction transistors.</p> <p>2. Utilise the necessary skill needed to analyse electronic circuits.</p> <p>3. Comprehend the designing and study of different types of amplifiers.</p>	<p>1. Acquire the basic knowledge about the use and application of diode and transistor circuits.</p> <p>2. Design and analyse circuits containing diodes and transistors.</p> <p>3. Learn the designing of transistor amplifiers and identify various types of amplifiers.</p> <p>4. Develop the knowledge about oscillators and FETs</p>
ELECTRONICS C-VI	DIGITAL ELECTRONICS AND VERILOG/VHDL	<p>1. Understand the binary and other number systems and Boolean algebra.</p> <p>2. Comprehend the digital</p>	<p>1. Identify the digital logic devices and their working principles.</p> <p>2. Write hardware level program</p>

		<p>principles and devices like logic gates.</p> <p>3. Understand the hardware programming language like Verilog/VHDL.</p>	<p>in Verilog and VHDL for designing digital circuits.</p> <p>3. Apply the knowledge to critically assess the pros and cons of various hardware design methodologies.</p>
ELECTRONICS-C-VII	C PROGRAMMING AND DATA STRUCTURES	<p>1. Understand high level programming language through C/C++ programming.</p> <p>2. Learn various sequential and object oriented programming paradigm.</p>	<p>1. Write C/C++ programs for various mathematical and data processing tasks</p> <p>2. Apply the knowledge of high level programming language to solving various scientific and real life problems using numerical methods</p> <p>3. Critically assess the applicability of numerical methods and high level language for solving human civilization problems.</p>
ELECTRONICS-C-VIII	OPERATIONAL AMPLIFIERS AND APPLICATIONS	<p>1. Understand the fundamentals of LSI circuit device Operational Amplifier (OP-AMP).</p> <p>2. To develop analytic and synthesis skills in circuits using OP-AMPS.</p>	<p>1. Understand working of the OP-AMP.</p> <p>2. Characterize various OP-AMP ICs and circuits.</p> <p>3. Apply the knowledge to use the OP-AMP in scientific and real life applications.</p>
ELECTRONICS-C-IX	SIGNALS AND SYSTEMS	<p>1. Understand the basic mathematical</p>	<p>1. Identify different signal types and understand the formalism of</p>

		<p>representation of electronic signals and systems</p> <p>2. Comprehend the various mathematical tools and techniques for analyzing different types of signals and systems</p>	<p>treating signals and systems in mathematical domain.</p> <p>2. Apply the mathematical tools to represent signals and analyze time domain and Frequency domain signals and systems like LTI.</p>
ELECTRONICS-C-X	ELECTRONIC INSTRUMENTATION	<p>1. Understand the various measurement instruments and the measurement techniques involved.</p> <p>2. Handle different instruments like power supply, Oscilloscope etc.</p> <p>3. Develop the knowledge about transducers and sensors.</p>	<p>1. Use and apply various measurement instruments.</p> <p>2. Measure resistance, capacitance, and temperature using available bridge methods.</p> <p>3. To design circuits for systems like power supply and sample and hold circuits etc.</p> <p>4. Acquire theoretical and practical knowledge about various sensors.</p>
ELECTRONICS-C-XI	MICRO PROCESSOR AND MICROCONTROLLER	<p>1. Microprocessors and microcontroller.</p> <p>2. Assembly language programming of microprocessors and microcontroller.</p>	<p>1. Understand architecture and programming model of microprocessors 8085 and microcontroller 8051</p> <p>2. Apply the assembly language programming knowledge to build various small systems based on microprocessors 8085 and microcontroller 8051.</p>

			3. Asses the applicability of microprocessors and microcontroller for solving various real life problems
ELECTRONICS-C-XII	ELECTROMAGNETICS	<p>1. Understand the physical and mathematical principles of the behaviour of electricity and magnetism in matter.</p> <p>2. Comprehend the properties of the electromagnetic wave and its interaction with matter with the help of Maxwell's equations.</p> <p>3. Understand the principles and processes related to polarization, interference, and diffraction along with their applications to the development of wave-guide and optical fibres.</p>	<p>1. Solve problems relevant to interfaces between media with defined boundary conditions.</p> <p>2. Use Maxwell's equations to describe the behaviour of electromagnetic waves in vacuum as well as medium.</p> <p>3. Describe states and methods of polarization and analyze the polarization state of a light source</p>
ELECTRONICS-C-XIII	COMMUNICATION ELECTRONICS	<p>1. Understand the basic techniques of electronic communication like modulation.</p> <p>2. Apply the knowledge to understand the current</p>	<p>1. Identify the basic techniques of communication like carrier modulation/demodulation.</p> <p>2. Analyze the modulations schemes and their applicability.</p>

		generation communication technologies.	3. Analyze present generation systems.
ELECTRONICS-C-XIV	PHOTONICS	<p>1. Understand the fundamental of optics and optical devices.</p> <p>2. Identify and apply optical principles in various applications.</p>	<p>1. Identify various optical devices and principles</p> <p>2. Characterize the optical devices</p> <p>3. Apply the knowledge to use optical devices in scientific and real life applications</p> <p>4. Critically analyze the advantage/disadvantages of optical systems and its applicability.</p>
ELECTRONICS-DSE -I	POWER ELECTRONICS	<p>1. Understand the various devices used in power electronics and develop the knowledge to deal with these devices.</p> <p>2. Realize and work with circuits like, inverter and chopper along with the knowledge of electro-mechanical machines.</p>	<p>1. Acquire the knowledge about various types of power devices and their uses.</p> <p>2. Understand the behaviour of these devices and will be able to use them wherever necessary.</p>
ELECTRONICS-DSE -2	MODERN COMMUNICATION SYSTEMS	<p>1. Learn about different types of new generation communication systems and technologies.</p> <p>2. Familiarize with the knowledge of optical</p>	<p>1. Understand the various techniques and methods used in modern day communication systems.</p> <p>2. Understand the technology behind different types of</p>

		communication, cellular communication, satellite communication and LAN	communication being used around us.
ELECTRONICS-DSE-3	NANOELECTRONICS	<p>1. The world of nanoscience and nanotechnology.</p> <p>2. The various preparation and characterization techniques of nanomaterials.</p> <p>3. The optical and electronic transport properties of nanomaterials and their applications.</p>	<p>1. Understand the importance of nanoscience and nanotechnology in our daily lives.</p> <p>2. Learn about various experimental methodologies with necessary theoretical background, which may be useful for pursuing further studies on the area of nanoscience and technology.</p>
ELECTRONICS-DSE 4	TRANSMISSION LINES, ANTENNA AND WAVE PROPAGATION	<p>1. Learn the basics of electromagnetic wave propagation.</p> <p>2. Learn about transmission lines and waveguides.</p> <p>3. Develop the knowledge of radiation of electromagnetic waves and types of antenna.</p>	<p>1. Understand the propagation of electromagnetic waves and how the electromagnetic wave can be effectively transmitted through transmission lines or wave guides.</p> <p>2. Comprehend the radiation of electromagnetic waves and the types of antenna</p> <p>3. Use mathematical simulation software like Scilab, MATLAB etc and to use them to calculate various parameters related to electromagnetic wave propagation, transmission lines, waveguides and antenna.</p>
ELECTRONICS-SEC-1	DESIGN AND FABRICATION OF PRINTED	1. Understand the fundamentals of printed	1. Learn the fundamental principles in Robotics.

	CIRCUIT BOARDS	<p>circuit boards and its classification.</p> <p>2. Develop the knowledge about designing and fabrication of printed circuit boards.</p>	<p>2. Learn robot programming and configuring environments.</p> <p>3. Understand various Robotic applications.</p>
ELECTRONICS-SEC-2	ELECTRONICS-SEC-2	<p>1. Learn the fundamental principles in Robotics.</p> <p>2. Learn robot programming and configuring environments.</p> <p>3. Understand various Robotic applications.</p>	<p>1. Identify the and understand working principles of Robotics</p> <p>2. Install and run Robot programming</p> <p>3. Apply the knowledge to using Robots for real life situations</p>
ELECTRONICS-GE-1	ELECTRONIC CIRCUITS AND PCB DESIGNING	<p>1. Learn various uses and applications of diodes and bipolar junction transistors.</p> <p>2. Acquire the necessary skill to analyse electronic circuits.</p> <p>3. Learn about designing and study of small signal amplifiers.</p> <p>4. Understand the fundamentals of printed circuit boards and its classification.</p> <p>5. Develop the knowledge about designing and</p>	<p>1. Acquire the basic knowledge about the use and application of diode and transistor circuits.</p> <p>2. Design and analyse circuits containing diodes and transistors.</p> <p>3. Learn the designing of transistor amplifiers and identify various types of amplifiers.</p> <p>4. Develop the knowledge about printed circuit boards in electronic applications and will learn the techniques and processes involved in the design and fabrication of printed circuit boards.</p>

		<p>fabrication of printed circuit boards.</p> <p>6. Learn etching and soldering process.</p>	
ELECTRONICS-GE-2	DIGITAL SYSTEM DESIGN	<p>1. Learn about the digital principles like number systems and Boolean algebra</p> <p>2. Apply the digital electronic principles in circuit analysis and synthesis.</p>	<p>1. Identify and understand digital electronics principles and systems.</p> <p>2. Apply the knowledge to build small electronic systems using digital ICs and techniques.</p>
ELECTRONICS-GE-3	INSTRUMENTATION	<p>1. Learn about the various measurement instruments and the measurement techniques involved.</p> <p>2. Handle different instruments like signal generators and Oscilloscope.</p> <p>3. Develop the knowledge of the students about transducers of different types.</p> <p>4. Learn about data acquisition systems.</p> <p>5. Gain theoretical and practical knowledge about various instruments used in</p>	<p>1. Acquire the necessary knowledge to use different measuring instruments for measurements of voltage, currents and resistances.</p> <p>2. Acquire the knowledge to handle and use oscilloscope, DSO and pulse generators.</p> <p>3. Equip themselves with the theoretical and practical knowledge about various types of transducers.</p> <p>4. Learn about the various sections of a data acquisition system (DAQ) and the function of DAQ in general.</p> <p>5. Learn about some very</p>

		the field of biological sciences and medical science.	important instruments used in the field of biological and medical science.
ELECTRONICS-GE-4	COMMUNICATION SYSTEMS	<p>1. Learn the basics of electronic communication systems and the significance of noise in communication.</p> <p>2. Understand the various types of modulation schemes both theory and practical.</p> <p>3. Learn about various digital modulation techniques and some associated concepts.</p> <p>4. Study various types of multiple accessing techniques.</p> <p>5. Understand cellular communication and satellite communications.</p>	<p>1. Learn some of the most fundamental techniques used in communication.</p> <p>2. Understand the various aspects of a communication system.</p> <p>3. Recognise the different available modulation techniques along with the practical knowledge about the technology behind the schemes.</p> <p>4. Equip themselves with the knowledge to understand analog and digital modulation techniques.</p> <p>5. Learn about different aspects of cellular communication and satellite communication systems.</p>