

Outcome Based Education (OBE)

BOOKLET FOR

B.Tech (Electronics) Program **2018**

ELECTRONICS ENGINEERING DEPARTMENT

Birla Vishvakarma Mahavidyalaya

(Autonomous Engineering College)

Vallabh Vidyanagar, Gujarat, India

BIRLA VISHVAKARMA MAHAVIDYALAYA (AUTONOMOUS ENGINEERING COLLEGE)

ABOUT BVM:

BVM is premier institution in the field of technical education established in 1948 and is managed by Chartuar Vidya Mandal. The motto of the institute is “Work is worship”. More than 20000 engineers have graduated from this college and around a third of them are working aboard.

VISION OF INSTITUTE:

“Produce globally employable innovative engineers with core values”

MISSION OF INSTITUTE:

- Re-engineer curricula to meet global employment requirements.
- Promote innovative practices at all levels.
- Imbibe core values.
- Reform policies, systems and processes at all levels.
- Develop faculty and staff members to meet the challenges.

AFFILIATIONS OF THE COLLEGE:

- Bombay University: June 1948 - May 1951
- Gujarat University: June 1951 - May 1957
- Sardar Vallabhbhai Vidyapeeth: June 1957 to June 2008
(Re-named as Sardar Patel University in 1966)
- Gujarat Technological University: June 2008 Onwards
- First Autonomous Institute of Gujarat since June 2015

UNDER GRADUATE PROGRAMS:

| Sr. No | Branch | Seats |
|---------------|-----------------------------|--------------|
| 01 | Civil Engineering | 120 |
| 02 | Computer Engineering | 60 |
| 03 | Electrical Engineering | 60 |
| 04 | Electronics Engineering | 75 |
| 05 | Mechanical Engineering | 90 |
| 06 | Production Engineering | 30 |
| Total | | 435 |
| 07 | Mechanical Engineering (SF) | 30 |

Outcome Based Education (OBE)

| | | |
|--------------|--------------------------------------|------------|
| 08 | Production Engineering (SF) | 30 |
| 09 | Information Technology (SF) | 60 |
| 10 | Electronics & Telecommunication (SF) | 60 |
| 11 | P.D.D.C (Mechanical) - Part Time | 30 |
| Total | | 645 |

POST GRADUATE PROGRAM (SF)

| Sr. No. | Branch | Seats |
|----------------|---|--------------|
| 01 | M. Tech Structural Engineering | 18 |
| 02 | M. Tech Computer Engineering | 25 |
| 03 | M. Tech Construction Engineering & Management | 18 |
| 04 | M. Tech Environmental Engineering | 18 |
| 05 | M. Tech Machine Design | 18 |
| 06 | M.Tech Transportation System Engineering | 18 |
| 07 | M. Tech Power System Engineering | 18 |
| 08 | M. Tech Infrastructure Engineering & Technology | 18 |
| Total | | 151 |

ABOUT OUTCOME BASED EDUCATION:

Globalization has brought in a clear shift from education as transmission of expert knowledge to education as building learner competencies which includes learning to learn and lifelong learning. Preparing global engineers who will be required to shoulder unforeseen challenges. Outcome based education (OBE) is student centred instruction that focuses on measuring student performance i.e. outcomes. Outcomes include knowledge, skills, and attributes suggested by National Board of Accreditation.

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ELECTRONICS ENGINEERING DEPARTMENT

VISION

“Produce globally employable innovative electronics engineers with core values”

MISSION

1. Promote Innovative Practices to strengthen teaching and learning process in electronics engineering
2. Develop faculty and staff to meet challenges in Electronics engineering
3. Adapt Engineering curricula to meet global requirements for Electronics engineering programme
4. Reform policies, systems and processes at all levels
5. Imbibe core Values.

ABOUT ELECTRONICS ENGINEERING DEPARTMENT:

Electronics Engineering Department offers B. Tech program and senior faculty members are also guiding Ph. D. candidates registered in various universities. The department has highly qualified, well experienced and dedicated faculty members. The department is equipped with advanced instruments and equipment's for research facilities. Experts from leading industries and educational institutes are invited frequently for guest lectures on recent developments for the benefit of student and faculty. The department is organizing various training programs in thrust areas for students, faculty and industrial personnel. It has signed MoU with various industrial and research agencies under the auspices of Industry Institution Interaction initiative. The graduates of this department are well placed in national and multinational companies in the core, IT and services sectors and academic institutions.

FACULTY DETAILS:

| Sr. No. | Staff Member | Present Post | Date of Joining | Qualifications | Area of Specialization / Interest |
|----------------|---------------------|---------------------|------------------------|-----------------------|--|
| 1 | Prof. T. D. Pawar | Professor & Head | 24-11-1997 | B.E., M. Tech, Ph. D | Signal Processing and Communication Engg. |
| 2 | Prof. D. M. Patel | Professor | 24-11-1997 | B.E., M. Tech, Ph. D | Embedded and IoT Systems, Control and Automation |
| 3 | Prof. D. L. Vala | Asso. Professor | 18-04-2006 | B.E., M.E., Ph. D | Signal Processing and Microwave Commu. |
| 4 | Prof. J. M. Rathod | Asso. Professor | 04-12-1997 | B.E., M.E., Ph. D | RF Comm. and Antenna Design |

B.Tech (Electronics) Program 2018

| Sr. No. | Staff Member | Present Post | Date of Joining | Qualifications | Area of Specialization / Interest |
|----------------|-------------------------|---------------------|------------------------|--------------------------------------|---|
| 5 | Prof. A. A. Daiya | Asso. Professor | 17-12-1990 | B.E., M.E. | Power Electronics and Integrated Circuits |
| 6 | Prof. (Ms). M. S. Holia | Asstt. Professor | 01-08-2002 | B.E., M.E., Ph. D | Signal Processing and Embedded Systems |
| 7 | Prof. (Ms). K. D. Patel | Asstt. Professor | 01-08-2002 | B.E., M.E., Ph. D | Computer Networks, Control and Automation |
| 8 | Prof. M.M. Khambalkar | Asstt. Professor | 21-06-2004 | B.E., M.E. | Biomed. Signal Processing and Communication Engg. |
| 9 | Prof. (Ms) P.H. Panchal | Asstt. Professor | 16-01-2006 | B.E., M.E., (Ph. D Pursuing) | Biomedical and Instrumentation and Embedded Systems |
| 10 | Prof. M. M. Solanki | Asstt. Professor | 19-01-2006 | B.E., M.E., (Ph. D Thesis submitted) | Wireless Communication, Control and Automation |
| 11 | Prof. M. P. Prajapati | Asstt. Professor | 17-03-2006 | B.E., M.E. | Electronics Communication Engg. |
| 12 | Prof. C. S. Patel | Asstt. Professor | 22-07-2010 | B.E., M. Tech. | VLSI Technology |
| 13 | Prof. C. J. Jayaswal | Asstt. Professor | 03-09-2010 | B.E., M. Tech. | Electronics Communication Engg. |
| 14 | Prof. N. R. Ada | Asstt. Professor | 01-10-2010 | B.E., M.E. | RF Comm. and Antenna Design |
| 15 | Prof. (Ms.) A. N. Bhatt | Asstt. Professor | 01-07-2014 | B.E., M. Tech. | VLSI Technology |
| 16 | Mr. H. C. Patel | Lab. Asstt. | 11-12-1991 | D.E. (Electrical) | - |
| 17 | Mr. H. J. Sevak | Instru. Mech. | 01-01-1993 | I.T.I. | - |

Outcome Based Education (OBE)**PROGRAM EDUCATIONAL OBJECTIVES (PEOs)**

1. Study and analysis of Electronics engineering systems.
2. Adapt state-of-art developments in Electronics engineering and eco-friendly technologies.
3. Design and develop Electronic hardware and software based applications.

PROGRAM OUTCOMES (PO)

| PO | Title | Program Outcome |
|----|---|--|
| 1 | Engineering knowledge: | Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems. |
| 2 | Problem analysis: | Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences. |
| 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 the public health and safety, and the cultural, societal, and environmental considerations. |
| 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. |
| 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. |
| 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. |
| 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 | Title | Program Outcome |
|-----------|---------------------------------|--|
| 8 | Ethics: | Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice. |
| 9 | Individual and team work: | Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings. |
| 10 | Communication: | Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions. |
| 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. |
| 12 | Life-long learning: | Recognize the need for, and have the preparation and ability to engage in Independent and life-long learning in the broadest context of technological change. |

LIST OF EQUIPMENT

| Sr. No. | Name of Equipment | Model No. | Maker | Qty. (Units) | Source |
|----------------|---|------------------|-------------------|---------------------|---------------|
| 1 | RF Signal Generator: 9KHz- 3GHz | N9310A | Agilent | 01 | TEQIP-II |
| 2 | Spectrum Analyzer: 9KHz- 3GHz | N9000A503 | Agilent | 01 | TEQIP-II |
| 3 | Scalar Network Analyzer: 400KHz - 2.5GHz | SNA 2550 | Elad | 01 | TEQIP-II |
| 4 | Vector Network Analyzer (VNA), 9KHz - 15GHz | MS 2037C | Anritsu | 01 | TEQIP-II |
| 5 | DSO: 200MHz, 2 Channel | DSOx 2022A | Agilent/ Keysight | 12 | TEQIP-II |
| 6 | DSO: 50MHz, 2 Channel | 1052B | Agilent/ Keysight | 12 | TEQIP-II |

Outcome Based Education (OBE)

| Sr. No. | Name of Equipment | Model No. | Maker | Qty. (Units) | Source |
|---------|--------------------------------------|----------------|--------------------------|--------------|----------|
| 7 | Arbitrary Function Generator, 25 MHz | AFG 1022 | Tektronics | 06 | TEQIP-II |
| 8 | Desktop Computers | Veriton - M200 | Acer - i5 OS Windows 8.1 | 20 | TEQIP-II |
| 9 | Desktop Computers | Veriton | Acer - i5 OS Windows 10 | 15 | CVM |
| 10 | Software Define Radio | FMCOM3 | Analog Device | 1 | GUJCOST |

LIST OF COURSE SOFTWARE

| Sr. No. | Name of Software | Make | Qty. (Units) | Source |
|---------|------------------|------------------------|----------------------|----------|
| 1 | Proteus VSM | Lab Center Electronics | 10 User | TEQIP-II |
| 2 | MATLAB-2017b | Mathworks Inc. | 100 User Inst. level | TEQIP-II |
| 3 | HFSS-17 | Ansys | 05 User | TEQIP-II |
| 4 | Xilinx- Vivado | Xilinx | 25 User | TEQIP-II |

PROGRAM SPECIFIC OUTCOMES

| Sr. No | Short name | Program Outcome |
|--------|--|---|
| PSO1 | Analysis and Evaluation Of electronic circuits | Analyse electronic circuits and performance evaluation of electronics system. |
| PSO2 | Design for problems | Design analogue and digital circuits using relevant software and hardware for various applications In electronics domain. |
| PSO3 | Design of electronics systems | Demonstrate the skills to design electronics systems. |

COURSE OUTCOME

| Subject Code | Subject Name | Course Outcomes |
|---------------------|---|--|
| SEMESTER-1 | | |
| CC101 | Calculus | Acquire knowledge of advanced differential calculus for single variable and their applications |
| | | Get acquainted with the knowledge of functions of several variables. |
| | | Apply knowledge of differential and integral calculus of several variables for engineering applications. |
| CC111 | Basic Civil Engineering and Environmental Studies | Carry out linear, angular & levelling measurements using survey methods. |
| | | Acquainted to common building materials, components & simple building drawing. |
| | | Gain knowledge of the different transportation modes and their elements. |
| | | Recognize importance of Natural Resources. |
| | | Impact assessment of various pollution and remedial measures. |
| CC122 | Computer Workshop | Understand basics of computer hardware. |
| | | Install operating systems, drivers related to hardware and other software. |
| | | Configure operating system for effective management of resources. |
| | | Manage security related basic problem using anti-virus software. |
| | | Create reports, presentation, and spread sheets. |
| | | Work with various tools for collaboration and website creation. |
| CC143 | Engineering Physics | Apply the Basic Laws of Physics in Quantum Mechanics, to understand the concepts of wave particle duality, black body Radiation De-Broglie's hypothesis and uncertainty Principle. |
| | | Understand the working principle of a Laser and Optical Fibre communication, their components, working of different Laser systems and their engineering applications |

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| Subject Code | Subject Name | Course Outcomes |
|---------------------|------------------------------------|--|
| | | Apprise observation, experiment and theory work together to continue to expand the frontiers of knowledge of the Engineering Physics in the field of superconductivity |
| | | Understand the basics of Acoustics and Ultrasonic and their applications |
| | | Understand basic concepts of Nanophysics and their various applications. |
| CC152 | Elements of Mechanical Engineering | Use the concepts of units, systems (open, closed systems and control volumes) and its boundaries, properties, state, process, cycle, quasi-static process in context of energy conversion. |
| | | Assess thermodynamic properties of gases and steam, and apply it to systems of relevance. |
| | | Interpret the fundamentals of I C engine and air compressors. |
| | | Interpret the fundamentals of pumps, refrigerators and air-conditioners. |
| | | Identify the transmission systems and its components. |
| CC171 | Communication Skills | Acquire Presentation skills and Group Discussion skills |
| | | Acquire knowledge of communication and its components |
| | | Improve language skills -LSRW |
| | | Develop basic and intermediate competency in English language |
| | | Overcome communication phobia in English |
| SEMESTER-2 | | |
| CC102 | Vector Calculus and Linear Algebra | Solve system of linear equations using different tools of linear algebra for the problems |
| | | Use Eigen values and Eigen vector in different subjects of engineering like control theory, vibration analysis, electric circuits, advanced dynamics and quantum mechanics. |

| Subject Code | Subject Name | Course Outcomes |
|--------------|-----------------------------|---|
| | | Apply vectors in higher dimensional space in experimental data, storage and warehousing, |
| CC121 | Computer Programming | Explain different features (keywords, constructs, functions, pointers, etc...) of C programming language. |
| | | Break-up a medium (or large) problem into smaller sub-problems to make it tractable for a possible solution through computer programming. |
| | | Represent and communicate a conceived solution to a problem in a systematic way using the tools of algorithms and flow-charts |
| | | Use different features of C programming language to develop a possible programming solution to a given problem in each domain |
| | | Decipher a given C program of simple to moderate complexity and determine the output. |
| | | Identify syntactical and semantic errors in given C program. |
| CC131 | Basic electrical Technology | Assess the knowledge about the electric and magnetic circuits. |
| | | Practice the fundamentals of AC supply systems and their applications. |
| | | Interpret the working and applications of various electrical machines. |
| | | Associate the knowledge about various measuring instruments and wiring system. |
| | | Comprehend the advance subjects of electrical engineering. |
| CC141 | Fundamentals of Electronics | Identify the applications and functions of electronics in Engineering. |
| | | Acquire knowledge about semiconductor physics for intrinsic and extrinsic materials. |
| | | Understand the basic of semiconductor diodes, BJTs and their small signal |
| | | Analyse the performance of BJTs on the basic of their operation and working. |

Outcome Based Education (OBE)

| Subject Code | Subject Name | Course Outcomes |
|---------------------|--|--|
| CC142 | Electronics workshop | Build a small electronic circuit. |
| | | Identification and testing of basic electronics Components. |
| | | Use of analogy and digital instruments for troubleshooting. |
| | | Understand the operating function about basic instruments like CRO, Digital Storage Oscilloscope Power Supply, Function Generator and Digital Multi meter etc. |
| | | Design and development of PCB and soldering of components. |
| CC151 | Engineering Graphics | Interpret standard conventions used in engineering drawing and construction of plain and diagonal scales. |
| | | Construct orthographic and isometric projections. |
| | | Construct various engineering curves and identify its various applications. |
| | | Construct projections of points and straight lines. |
| | | Interpret different planes and solids and construct their projection. |
| | | Create sections of solids and develop surfaces. |
| CC174 | Value Education, Human Rights and Legislative Procedures | Inculcate the core Values of education |
| | | Trigger their social behaviour and Personality |
| | | Civilize in the societal settings |
| | | Adopt moral behaviour and act accordingly. |
| SEMESTER-3 | | |
| MA201 | Advanced Engineering Mathematics | Do expansion of functions in terms of basic trigonometric functions. |
| | | Analyse differential equations. |
| | | Solve differential equations by using tool like Laplace transform, Fourier series and series solution. |
| | | Create a modelling of engineering problems. |

| Subject Code | Subject Name | Course Outcomes |
|---------------------|-------------------------|---|
| EL201 | Signals and Systems | Understand the analytical frame work, mathematical description and representation of Signals. |
| | | Derive and examine a fundamental representation of LTI systems. |
| | | Understand and analyse the representation of periodic signals in continuous and discrete time. |
| | | Understand and analyse the representation of aperiodic signals in continuous and discrete time. |
| | | Relate time-domain and frequency-domain characteristics of the LTI systems. |
| | | Understand the concept of sampling of a signal and reconstruction of a signal from the samples. |
| | | Understand the generalization of frequency representation of continuous time and discrete time systems. |
| | | Understand the analytical frame work, mathematical description and representation of Signals. |
| EL202 | Linear Circuit Analysis | Apply various circuit laws, theorems and analysis techniques. |
| | | Analyse behaviour of passive circuits such as RC, RL and RLC. |
| | | Apply Laplace Transform for circuit analysis. |
| | | Analyse circuit in the S- Domain |
| | | Study various two port networks. |
| EL203 | Analog Electronics | Understand the basics of BJTs and MOS circuits. |
| | | Analyse the multistage amplifiers and understand its frequency response. |
| | | Analyse and Design the performance of negative feedback circuits and Oscillators. |
| | | Understand the use of op-amp using MOS. |
| | | Analyse the power amplifiers and wave shaping circuits. |
| EL204 | Digital Electronics | Understand digital number systems and logic gates. |
| | | Analyse logic function minimization. |

Outcome Based Education (OBE)

| Subject Code | Subject Name | Course Outcomes |
|---------------------|--------------------------------------|---|
| | | Design combinational and sequential circuits. |
| | | Design simple digital circuits using FSM. |
| | | To study the functions of various digital integrated circuits and ADC, DAC. |
| | | Simulate digital circuits using Hardware descriptive language. |
| MA202 | Professional Soft Skills | Understand organizational structure. |
| | | Promote professionalism. |
| | | Enhance advanced level of communication with special focus on organizational structure. |
| | | Enhance their presentations style and their ability to deal with the variety of organizational communication i.e. presentations, conferences, meetings, interviews and the other. |
| SEMESTER-4 | | |
| MA203 | Engineering Economics and Management | Understand and apply the basics of economics and management to engineering areas. |
| | | Understand and apply the basics of demand, demand forecasting, elasticity et al. to engineering projects. |
| | | Apply the basics of project planning project evaluation break even depreciation and costing and et al to engineering. |
| | | Understand product development product life cycle and its advantages to the organization. |
| | | Understand quality concepts. |
| | | Understand human resource development recruitment and training and its advantages to the organization. |
| EL205 | Electromagnetic Field Theory | Understand and apply Maxwell's equations in governing electric and magnetic forces. |
| | | Calculate line parameters, characteristic impedance and propagation constants for coaxial, two-wire, parallel plate and micro strip transmission lines. |
| | | Apply vector calculus for solving electromagnetic problems of gradient, divergence and curl operations. |

| Subject Code | Subject Name | Course Outcomes |
|---------------------|------------------------------------|--|
| | | Understand Coulomb' and Gauss laws and apply them to electrostatic problems. |
| | | Understand Biot-Savart and Ampere laws and apply them to magneto static problems. |
| EL206 | Control Systems | Understanding of basic linear feedback principles and find out the transfer function using various methods. |
| | | Able to represent Mathematical model for different physical system determine conditions that guarantee the linear system stability. |
| | | Able to design system with controller to improve system transient and steady state response |
| | | Able to sketch the static feedback root locus and determine the location of the closed-loop poles. |
| | | Able to draw Nyquist plots, bode plots and find stability margins. |
| | | Able to present and analyse linear control system using the state space technique |
| EL207 | Analog Communication | Understand Basic Communication System and noise present in systems. |
| | | Evaluate fundamental communication system factors, such as bandwidth, power and signal to quantization noise ratio. |
| | | Able to describe classification of elementary signals and noise with different noise parameter like noise factor, noise temperature and noise bandwidth. |
| | | Use Fourier transforms for frequency analysis of communication systems. |
| | | Examine basic types of modulation scheme for analog communication (AM, FM, PM). |
| EL208 | Micro Controllers and Applications | Explore Architecture and practice related to basic Microcontroller. |
| | | Program the microprocessors and microcontrollers. |
| | | Able to design Microcontrollers based systems. |

Outcome Based Education (OBE)

| Subject Code | Subject Name | Course Outcomes |
|-------------------|---|--|
| | | Use software tools to simulate and ability to analyse the peripherals interfacing Design of microcontroller based Systems, and use it in applications. |
| | | Explore Architecture and practice related to basic Microcontroller. |
| | | Program the microprocessors and microcontrollers. |
| EL209 | Electronic Measurements and Instrumentation | Understand the terminology of instruments. |
| | | Understand the sensors. |
| | | Apply the transducers for various electronic applications. |
| | | Able to apply signal conditioning for measurements. |
| | | Explain various measurements techniques for industrial and laboratory applications of various transducers. |
| EL210 | Electronic Design and Automated Tools | Use software tools like NGspice/LTSpice/Multisim/Orcad. |
| | | Simulate various analog and digital circuits using NGspice/LTSpice/Multisim/Orcad. |
| | | Design PCB for given circuit using PCB Software like EAGLE, Express PCB, OrCAD. |
| Subject Code | Subject Name | Course Outcomes |
| SEMESTER-5 | | |
| EL301 | Digital Communication | Analyse different baseband modulation techniques like PCM, DM, ADM. |
| | | Analyse the concept of ISI and reduction of ISI through Nyquist criteria. |
| | | Compare various digital modulation-demodulation techniques |
| | | Understand probability, random variable and various statistical analysis methods. |
| | | Derive channel capacity for discrete memory less channel and continuous channel. |
| EL302 | Analog Circuit Design | Understand basic characteristics of op-amp. |
| | | Analyse the basic block diagram and datasheets for op-amp. |

| Subject Code | Subject Name | Course Outcomes |
|--------------|------------------------------|---|
| | | <p>Design the op-amp's linear, non-linear circuits and active filters applications.</p> <p>Test and Analyse special purpose ICs and their application circuits.</p> <p>Understand basic characteristics of op-amp.</p> |
| EL303 | Antenna and Wave Propagation | <p>Apply Antenna theory to design various antennas.</p> <p>Analyse and measure the fundamental antenna parameters.</p> <p>Design various antennas performance using Electromagnetic Simulators.</p> <p>Understand and analyse the operation of different types of antennas.</p> |
| EL304 | Advanced Micro Controller | <p>Knowledge of Architecture and practice related to various Microcontrollers available in the market today.</p> <p>Understand and analyse the various design challenges and techniques for solution by Microcontrollers based designs.</p> <p>Use software tools to simulate and analyse the performance of Design of microcontroller based Systems, and use it in real time applications.</p> <p>Ability to identify, formulate and solve engineering problems related to Real time Electronics design solutions.</p> |
| EL305 | Guided Research and Reading | <p>Guided research reading helps students to understand texts and to use a range of reading and thinking strategies on other texts.</p> <p>Assessment that emerges from the classroom rather than being imposed upon it is integral to guided reading.</p> <p>Guided reading requires that comprehension strategies be modelled by teachers and that students be encouraged to use them independently before, during, and after their reading of a text.</p> |

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| Subject Code | Subject Name | Course Outcomes |
|-------------------|---------------------------------------|--|
| | | Guided reading is much more than a set of activities to work through. An understanding of the theoretical underpinnings is essential. |
| EL351 | Power Drivers Electronics and Drivers | Understand the power semiconductor devices. |
| | | Design and analyse various SCR firing, commutation methods and Phase controlled rectifiers. |
| | | Design and understand the operation of various industrial based power electronics circuits like inverters, choppers and Cycloconverters. |
| | | Foster ability to understand the use of DC drives and AC drives in industrial applications. |
| EL352 | Digital System Design | Understand Hardware Descriptive Language and different design methodology. |
| | | Design Combinational and sequential circuits using HDL. |
| | | Design synchronous circuits using FSM and analyse Asynchronous circuits and timing |
| SEMESTER-6 | | |
| EL306 | VLSI Design | Understand VLSI design flow and different design methodology. |
| | | Understand fabrication process of MOSFETs and CMOS. |
| | | Understand MOS theory. |
| | | Analyse the CMOS construction & its characteristics. |
| | | Apply CMOS fundamentals to design CMOS based digital circuits. |
| EL307 | Digital Signal Processing | Understands the fundamentals, implementations and application of DSP. |
| | | Understand applications of z- transforms. |
| | | Design the digital filters. |
| | | Analysis of the frequency response of discrete-time signals and systems. |

| Subject Code | Subject Name | Course Outcomes |
|--------------|------------------------|---|
| | | <p>Develop programs using software tools for DSP algorithms.</p> <p>Understand the difference between fixed point and floating point digital signal processor and select them as per requirement of applications</p> |
| EL308 | Microwave Engineering | <p>To understand TE, TM, TEM mode propagation, advantages and applications of microwaves.</p> <p>To understand, analyse and solve problems related microwave transmission line.</p> <p>To understand and analyse the concept of various active and passive microwave components for different applications.</p> <p>To understand the concept of various microwave tube devices.</p> |
| EL341 | Mini Project | <p>Students will be able to practice acquired knowledge within the chosen area of technology for project development.</p> <p>Identify, discuss and justify the technical aspects of the chosen project with a comprehensive and systematic approach.</p> <p>Reproduce, improve and refine technical aspects for engineering projects.</p> <p>Work as an individual or in a team in development of technical projects.</p> <p>Communicate and report effectively project related activities and findings</p> |
| EL353 | Digital Control System | <p>Understand the role of different types of digital PID controller and its realization in control system design.</p> <p>Understand the methodology of feedback control system and different types of stability analysis for them.</p> <p>Identify, formulate digital control system, and analyse optimal control system.</p> <p>Understand of digital control system and able to predict system behaviour.</p> |

Outcome Based Education (OBE)

| Subject Code | Subject Name | Course Outcomes |
|---------------------|-----------------------------|--|
| EL354 | Optical Fiber Communication | Understand the basic elements of optical fibre transmission link, fibre modes and structure configurations. |
| | | Analyse the different kind of losses, signal distortion in optical wave guides. |
| | | Design optical source materials, LED / Laser diodes structures and Transmission Systems. |
| | | Analyse the fibre optical receiver operation and configuration. |
| EL371 | Electronic Communication | Understand the basic concept Communication system. |
| | | Analyse Digital communication systems. |
| | | Use network fundamentals for LAN. |
| | | Understand the Internet technologies it's security aspects. |
| | | Analyse Cellular Technologies. |
| SEMESTER-7 | | |
| EL401 | Wireless Communication | Understand the basics of Wireless Communication, Evolution and comparison. |
| | | Understand the basic concepts of basic Cellular System, design requirements and basic Principles behind radio resource management techniques such as power control, channel allocation and handoffs. |
| | | Gain insights into various mobile radio propagation models and how the diversity can be exploited to improve performance. |
| EL402 | Embedded System Design | Knowledge of theory and practice related to Embedded System. |
| | | Understand and analyse the Hardware techniques and Design of Software codes for Embedded Systems. |
| | | Use software tools to simulate and analyse the performance of Embedded Systems and development of model for real time Application. |

| Subject Code | Subject Name | Course Outcomes |
|--------------|-----------------------------------|--|
| | | <p>Ability to identify, formulate and solve engineering problems by using Embedded Systems.</p> <p>Ability to implement real field problem by gained knowledge of Embedded Systems</p> |
| EL431 | Seminar | <p>Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the Electronics engineering practice.</p> <p>Understand the impact of the Electronics engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.</p> <p>Apply ethical principles and commit to professional ethics and responsibilities and norms of the Electronics engineering practice</p> <p>Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings</p> |
| EL451 | Process Instrumentation & Control | <p>Identify, formulate and analyse complex process control system problems related to industrial automation.</p> <p>Understand the analytical frame work, description of actuators, final control elements and continuous and discrete control system.</p> <p>Design solutions for simple process problems and design small data acquisition system.</p> <p>Identify the need for the automation problems, and have the preparation and ability to engage independent and life-long learning in the broadest context of technological change.</p> <p>Identify, formulate and analyse complex process control system problems related to industrial automation.</p> |

Outcome Based Education (OBE)

| Subject Code | Subject Name | Course Outcomes |
|--------------|--|---|
| EL452 | Radar & Navigation Aids | Knowledge in the topics such as Fundamentals of Radar |
| | | To become familiar with fundamentals of Different types of RADAR |
| | | To gain in-depth knowledge about the different types of RADAR and their operations |
| | | Understand signal detection in RADAR and various detection techniques |
| EL453 | Data Communication & Networking | Apply the knowledge of communication techniques, medias and fundamentals of layer architecture to the solve computer networks' problems. |
| | | Design solutions for different communication networks |
| | | Analyse any system as layered architecture system. |
| | | Able to choose appropriate protocol on each layer based on application demand. |
| EL454 | Digital Image Processing | Understand the basic concepts of two-dimensional signal acquisition, Sampling, and quantization. |
| | | Apply the knowledge of spatial filtering techniques and enhance image quality using image enhancement techniques. |
| | | Understand the DFT and able to filter given image using frequency domain filtering technique. |
| | | Apply the knowledge of Image restoration and reconstruction and select the right image restoration technique to remove degradation from given image |
| | | Understand image segmentation, image compression and image morphological operations. |
| EL471 | Microcontroller Based Electronics System | Understand the architecture of AVR 8-bit Microcontroller and importance and function of each pin of AVR ATmega32 Microcontroller. |
| | | Write, debug and simulate embedded C language programs. |

| Subject Code | Subject Name | Course Outcomes |
|-------------------|----------------------------|--|
| | | <p>Understand Timer operation, Interrupt environment and Serial Communication and.</p> <p>Interface I/O peripherals like LCD, ADC, DAC devices with microcontroller</p> |
| SEMESTER-8 | | |
| EL441 | Project | Apply the knowledge of electronics engineering to the solution of electronics engineering problems/project. |
| | | Review research literature, and analyse complex engineering problems reaching substantiated conclusions. |
| | | Use research-based knowledge and research methods, including design of experiments, analysis and interpretation of data to design electronic project. |
| | | Apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to design electronics circuits using relevant software and hardware for embedded, IOT, signal processing and communication etc. based application. |
| | | Understand the impact of the electronics engineering solutions to societal and environmental contexts, ethical principles and norms of the electronics engineering practice. |
| EL455 | Antenna Design | Understanding basic antenna characteristics. |
| | | Ability to select and justify an appropriate antenna for an engineering task. |
| | | Ability to model/optimize the antenna using ANSOFT HFSS. |
| | | Design and fabrication of antenna with optimization of results |
| | | Understanding basic antenna characteristics. |
| EL456 | Biomedical Instrumentation | To understand characterize anatomy and physiology of important physiological system of human body. |
| | | To understand the Analyse and design of medical instruments (particularly electronics part) by evaluating medical parameter measurement constraint. |

Outcome Based Education (OBE)

| Subject Code | Subject Name | Course Outcomes |
|---------------------|-----------------------------------|---|
| | | To analyse important vital sign parameters to evaluate certain disease conditions. |
| | | To Implementation of the electric safety of the medical instruments |
| EL457 | Internet of Things | Knowledge of theory and practice related to IoT System. |
| | | Understand and analyse the Hardware techniques and Design of Software codes for IoT Systems. |
| | | Use software tools to simulate and analyse the performance of IoT Systems and development of model for real time Application. |
| | | Ability to identify, formulate and solve engineering problems by using IoT Systems. |
| | | Ability to implement real field problem by gained knowledge of IoT Systems. |
| EL458 | Advance Microprocessor | Become familiar with the Intel 8086 microprocessor. |
| | | Understand instruction set and programming of 8086. |
| | | Learn Intel 80386, 80486, Pentium family. |
| | | Understand Instruction Level Parallelism. |
| EL459 | Satellite Communication | Understand principle, working and operation of various sub systems of satellite as well as the earth station. |
| | | Apply various communication techniques for satellite applications. |
| | | Analyse and design satellite communication link. |
| | | Analyse Propagation Effects and their Impact on Satellite –Earth Links. |
| EL446 | Industry Defined Project/Training | Apply the knowledge of electronics engineering to the solution of electronics engineering problems/project. |
| | | Review research literature, and analyse complex engineering problems reaching substantiated conclusions. |

| Subject Code | Subject Name | Course Outcomes |
|---------------------|---------------------|--|
| | | <p>Use research-based knowledge and research methods, including design of experiments, analysis and interpretation of data to design electronic project.</p> <p>Apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to design electronics circuits using relevant software and hardware for embedded, IOT, signal processing and communication etc. based application.</p> <p>Understand the impact of the electronics engineering solutions to societal and environmental contexts, ethical principles and norms of the electronics engineering practice.</p> |

MAPPING OF COURSES WITH PO's

| Subject Code | Subject Name | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-------------------|------------------------------------|-----------------------|------------------|--------------------|--|-------------------|--------------------------|---------------------------|--------|--------------------------|---------------|--------------------------------|-------------------|---|--------------------|-----------------------------|
| | | Engineering knowledge | Problem Analysis | Design of solution | Conduct investigations of complex problems | Modern tool usage | The Engineer and Society | Environment and Stability | Ethics | Individual and Team Work | Communication | Project management and finance | Lifelong learning | Analysis and Evaluation of electronics circuits | Design for problem | Design of electronic System |
| SEMESTER-1 | | | | | | | | | | | | | | | | |
| CC101 | Calculus | 2.75 | 2.00 | 1.50 | 2.00 | 2.25 | - | 1.00 | - | 2.00 | 2.00 | - | 2.50 | - | - | - |
| CC111 | Basic Civil Engineering | 2.33 | 1.83 | 2.16 | 2.33 | 2.00 | 2.00 | 1.67 | 2.00 | 2.33 | 2.16 | 2.00 | 2.16 | - | - | - |
| CC122 | Computer Workshop | 1.00 | 1.17 | 1.00 | 1.00 | 2.00 | 1.33 | 1.00 | 2.00 | 1.17 | 2.00 | 1.00 | 2.00 | - | - | - |
| CC143 | Engineering Physics | 2.17 | 1.50 | 1.40 | 1.00 | - | 1.67 | 1.67 | - | - | - | - | 1.00 | - | - | - |
| CC152 | Elements of Mechanical Engineering | 3.00 | 1.60 | 1.00 | - | - | - | - | - | - | - | - | - | - | - | - |
| CC171 | Communication Skills | - | - | - | - | - | 1.50 | - | 2.00 | 3.00 | 3.00 | - | 2.00 | - | - | - |
| SEMESTER-2 | | | | | | | | | | | | | | | | |
| CC102 | Vector Calculus and Linear Algebra | 2.50 | 2.00 | 2.33 | 1.67 | 1.50 | 1.80 | 2.50 | 2.00 | 2.25 | 1.67 | - | 2.33 | - | - | - |
| CC121 | Computer Programming | 2.33 | 2.17 | 2.17 | 1.00 | 1.83 | - | 1.50 | 2.00 | 1.50 | 1.33 | 1.17 | 1.13 | - | - | - |
| CC131 | Basic Electrical Technology | 2.40 | 2.00 | 2.20 | 2.00 | 2.40 | 2.40 | 1.60 | 1.60 | 1.60 | 2.00 | 1.00 | 1.00 | - | - | - |
| CC141 | Fundamental of Electronics | 3.00 | 2.00 | - | - | 1.00 | - | - | - | - | - | - | - | - | - | - |
| CC142 | Electronics Workshop | 2.20 | 2.00 | 2.40 | 1.50 | 2.50 | 1.00 | 1.00 | 1.00 | 2.33 | 1.00 | 1.67 | 2.00 | - | - | - |

| Subject Code | Subject Name | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-------------------|---|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| CC151 | Engineering Graphics | 3.00 | 2.00 | 2.00 | - | - | - | - | - | - | - | - | 2.00 | - | - | - |
| CC174 | Value Education, Human Rights & Legislative Procedure | - | - | - | - | - | 2.00 | 2.00 | 3.00 | 2.25 | 2.00 | 2.50 | 2.00 | - | - | - |
| SEMESTER-3 | | | | | | | | | | | | | | | | |
| MA201 | Advanced Engineering Mathematics | 2.50 | 2.50 | 2.00 | - | - | - | - | - | 1.00 | 2.00 | - | 2.00 | - | - | - |
| EL 201 | Signals and Systems | 3.00 | 2.43 | 2.00 | 1.00 | 2.00 | - | 1.00 | 1.00 | 2.00 | - | - | 3.00 | 2.33 | 1.14 | - |
| EL 202 | Linear Circuit Analysis | 3.00 | 2.00 | 1.00 | - | 1.00 | - | - | - | 1.00 | 1.00 | - | 1.00 | 3.00 | - | 1.00 |
| EL 203 | Analog Electronics | 2.60 | 1.60 | 2.00 | 1.60 | 1.00 | - | - | - | 1.00 | - | 1.00 | 1.60 | 1.00 | 1.00 | 2.00 |
| EL204 | Digital Electronics | 1.67 | 3.00 | 2.17 | 1.00 | 2.00 | - | - | - | - | - | - | - | 1.33 | 2.33 | 2.00 |
| MA202 | Professional Soft Skills | - | - | 1.00 | - | - | 2.00 | 1.33 | 2.25 | 2.75 | 3.00 | 1.67 | 2.25 | - | - | - |
| SEMESTER-4 | | | | | | | | | | | | | | | | |
| MA203 | Engineering Economics and Management | 3.00 | 3.00 | 2.00 | - | - | 2.00 | 1.00 | 1.00 | 1.00 | 1.50 | 1.50 | 3.00 | - | - | - |
| EL205 | Electromagnetic Field Theory | 1.60 | 3.00 | 3.00 | 2.60 | 2.50 | - | - | - | 3.00 | - | - | - | - | - | - |
| EL206 | Control Systems | 2.67 | 1.67 | 2.00 | 1.40 | 2.00 | 1.00 | 1.00 | 3.00 | 3.00 | 3.00 | 1.00 | 3.00 | 1.00 | 1.00 | 1.00 |
| EL207 | Analog Communication | 3.00 | 2.67 | 2.50 | 2.00 | - | 2.00 | 2.00 | 2.00 | 2.00 | 3.00 | 3.00 | 2.50 | 3.00 | 3.00 | 3.00 |
| EL208 | Microcontrollers and Applications | 3.00 | 2.00 | 1.80 | 1.33 | 2.60 | 1.00 | 1.00 | 3.00 | 1.80 | 1.00 | - | 3.00 | 1.80 | 1.80 | 2.40 |
| EL209 | Electronics Measurements and Instrumentation | 3.00 | 2.40 | 2.60 | 2.20 | 1.20 | 2.80 | 1.40 | 1.20 | 1.40 | 1.20 | 1.20 | 1.40 | 3.00 | 2.00 | 1.80 |
| EL210 | Electronics Design and Automation Tools | 1.67 | 1.00 | 3.00 | 1.00 | 3.00 | - | - | - | - | - | - | - | 2.00 | 3.00 | 3.00 |
| SEMESTER-5 | | | | | | | | | | | | | | | | |
| EL301 | Digital Communications | 3.00 | 1.67 | 1.80 | 1.00 | 2.00 | - | - | 1.00 | 1.00 | - | - | 3.00 | 1.00 | 1.00 | - |

Outcome Based Education (OBE)

| Subject Code | Subject Name | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-------------------|-------------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| EL302 | Analog Circuit Design | 3.00 | 2.75 | 2.75 | 1.00 | 2.00 | 2.00 | 2.00 | - | 1.00 | 1.00 | - | 2.00 | 1.00 | 1.00 | 1.00 |
| EL303 | Antennas and Wave Propagation | 3.00 | 2.00 | 1.75 | 2.00 | 2.50 | 1.00 | 1.00 | 1.00 | 1.00 | 2.00 | - | 3.00 | 1.75 | 1.00 | - |
| EL304 | Advanced Microcontrollers | - | - | 2.00 | 2.00 | 3.00 | 2.00 | 1.00 | - | - | - | - | 1.25 | 2.50 | 2.00 | 2.25 |
| EL305 | Guided Research and Reading | 2.25 | 1.75 | 2.00 | 2.75 | 2.00 | 2.25 | 1.33 | 1.00 | - | 2.00 | - | 2.00 | 1.00 | 2.00 | - |
| EL351 | Power Electronics and Drives | 2.00 | 1.75 | 2.25 | 1.33 | 1.67 | 1.00 | 1.00 | 1.00 | 2.00 | 1.00 | 2.00 | - | 1.33 | 2.50 | 1.50 |
| EL352 | Digital System Design | 3.00 | 2.25 | 1.50 | 1.75 | 2.00 | - | - | - | - | - | - | 2.00 | 2.00 | 3.00 | 2.00 |
| SEMESTER-6 | | | | | | | | | | | | | | | | |
| EL306 | VLSI Design | 3.00 | 2.20 | 1.40 | 1.60 | 2.00 | - | - | - | - | - | - | 2.20 | 2.20 | 1.40 | 1.40 |
| EL307 | Digital Signal Processing | 3.00 | 2.17 | 2.00 | 1.00 | 2.17 | - | - | 2.00 | 2.00 | - | - | 3.00 | 1.00 | 1.50 | 2.00 |
| EL308 | Microwave Engineering | 1.67 | 2.00 | 1.33 | 1.00 | 1.00 | 1.00 | 2.00 | - | - | - | - | 1.00 | 1.20 | 1.50 | 1.00 |
| EL341 | Mini Project | 1.00 | 1.00 | 2.50 | - | 2.00 | - | 1.00 | - | 2.00 | 1.50 | 2.00 | 1.00 | 1.33 | 1.50 | 1.67 |
| EL353 | Digital Control Systems | 3.00 | 1.75 | 2.00 | 1.00 | 2.00 | 2.00 | 1.00 | 1.00 | - | - | - | - | - | - | - |
| EL354 | Optical Fibre Communication | 3.00 | 2.00 | 2.00 | 2.00 | 1.00 | 1.00 | - | - | - | - | - | 1.00 | 1.00 | 1.00 | - |
| EL371 | Electronics Communication | 3.00 | 1.83 | 1.20 | 1.00 | 2.00 | - | - | 1.00 | - | 1.00 | - | 3.00 | 1.00 | - | 1.00 |
| SEMESTER-7 | | | | | | | | | | | | | | | | |
| EL401 | Wireless Communication | 3.00 | 2.33 | 2.17 | 2.00 | 2.33 | 1.33 | 1.00 | 3.00 | 3.00 | 3.00 | - | 3.00 | 2.50 | 2.83 | 1.00 |
| EL402 | Embedded System Design | 3.00 | 1.80 | 2.00 | 2.00 | 3.00 | 1.80 | 2.00 | 3.00 | 1.80 | 1.40 | 1.75 | 3.00 | 2.60 | 2.60 | 2.20 |
| EL431 | Seminar | 1.60 | 2.00 | 2.00 | 2.00 | 1.25 | 2.33 | 2.33 | 2.00 | 2.33 | 2.00 | 1.33 | 2.50 | 1.17 | 1.50 | 1.33 |
| EL451 | Process Instrumentation and Control | 2.25 | 2.25 | 2.00 | 2.00 | 2.00 | 2.50 | 1.25 | 1.50 | 1.50 | 1.50 | 1.25 | 1.25 | 2.50 | 2.25 | 2.50 |
| EL452 | Radar and Navigation Aids | 2.00 | 1.00 | 1.00 | 1.00 | 1.60 | 2.00 | 1.00 | 1.60 | 1.25 | 1.40 | 1.00 | 1.80 | 1.50 | 1.00 | 1.00 |
| EL453 | Data-communication and Networking | 3.00 | 2.80 | 2.00 | 2.60 | 2.20 | 3.00 | 1.20 | 2.00 | 2.00 | 3.00 | 2.00 | 3.00 | 2.80 | 1.60 | 1.40 |

| Subject Code | Subject Name | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|-------------------|---|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| EL454 | Digital Image Processing | 3.00 | 1.67 | 1.83 | 1.40 | 2.83 | 1.33 | - | 3.00 | 1.83 | 1.83 | 1.33 | 3.00 | 2.00 | 2.00 | 2.00 |
| EL471 | Microcontroller Based Electronic System | 1.50 | 2.00 | 2.00 | 1.67 | 3.00 | 2.00 | 1.25 | 1.00 | - | 1.00 | - | 1.00 | 1.50 | 2.00 | 1.75 |
| SEMESTER-8 | | | | | | | | | | | | | | | | |
| EL441 | Project | 3.00 | 1.50 | 2.00 | 1.50 | 1.40 | 1.67 | 1.20 | 2.00 | 1.33 | 1.33 | 3.00 | 1.00 | 1.80 | 1.00 | 1.60 |
| EL455 | Antenna Design | 2.25 | 1.75 | 2.00 | 2.75 | 2.00 | 2.25 | 1.33 | 1.00 | - | 2.00 | - | 2.00 | 1.00 | 2.00 | - |
| EL456 | Biomedical Instrumentation | 3.00 | 2.00 | 2.00 | 2.00 | 1.00 | 1.00 | 1.00 | - | 1.00 | 1.00 | - | 1.00 | 2.00 | 2.00 | 2.00 |
| EL457 | Internet of Things | 3.00 | 1.80 | 2.00 | 2.00 | 2.80 | 1.80 | 2.00 | 3.00 | 1.80 | 1.40 | 1.75 | 3.00 | 2.60 | 2.60 | 2.20 |
| EL458 | Advance Microprocessor | 2.00 | 2.17 | 1.50 | 1.67 | 1.67 | 3.00 | 3.00 | 3.00 | 2.50 | 3.00 | 2.00 | 2.00 | 2.00 | 2.17 | 1.50 |
| EL459 | Satellite Communication | 3.00 | 1.83 | 2.20 | 2.00 | 2.00 | 2.00 | 2.00 | 2.00 | 1.60 | 1.00 | 2.00 | 1.33 | 1.00 | 1.67 | 1.67 |
| EL446 | Industry Defined Project/ Tanning | 3.00 | 1.50 | 2.00 | 1.50 | 1.40 | 1.67 | 1.20 | 2.00 | 1.33 | 1.33 | 3.00 | 1.00 | 1.80 | 1.00 | 1.60 |

MAPPING OF CO's WITH PO's

| Subject Code | Subject Name | Course Outcomes | SEMESTER I | | | | | | | | | | | | | | | | | |
|--------------|--------------|--|-----------------|------------------|---------------------|---|-------------------|--------------------------|--------------------------------|--------|--------------------------|---------------|--------------------------------|--------------------|---|---------------------|-----------------------------|---|---|---|
| CC101 | Calculus | Acquire knowledge of advanced differential calculus for single variable and their applications Get acquainted with the knowledge of functions of several variables. Learn differential and integral calculus of several variables. Apply knowledge of differential and integral calculus of several variables for engineering applications. | P01 | P02 | P03 | P04 | P05 | P06 | P07 | P08 | P09 | P010 | P011 | P012 | PS01 | PS02 | PS03 | | | |
| | | | Engg. knowledge | Problem analysis | Design of solutions | Conduct investigation of complex problems | Modern tool usage | The engineer and society | Environment and sustainability | Ethics | Individual and team work | Communication | Project Management and finance | Life long learning | Analysis and Evaluation of electronics circuits | Design for problems | Design of electronic System | | | |
| | | | 3 | 2 | 1 | 1 | 3 | - | 1 | - | 2 | 2 | - | 3 | - | - | - | - | - | - |

| Subject Code | Subject Name | Course Outcomes | P01 | P02 | P03 | P04 | P05 | P06 | P07 | P08 | P09 | P010 | P011 | P012 | PS01 | PS02 | PS03 | |
|--------------|---|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|---|
| CC111 | Basic Civil Engineering and Environmental Studies | Carry out linear, angular & levelling measurements using survey methods. | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 2 | - | - | - | |
| | | Acquainted to common building materials, components & simple building drawing. | 3 | 2 | 3 | 2 | 2 | 1 | 2 | 1 | 2 | 3 | 2 | 2 | 2 | - | - | - |
| | | Gain knowledge of the different transportation modes and their elements. | 2 | 1 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | - | - | - |
| | | Recognize importance of Natural Resources. | 2 | 2 | 2 | 3 | 1 | 2 | 2 | 3 | 2 | 2 | 2 | 1 | 3 | - | - | - |
| | | Impact assessment of various pollution and remedial measures. | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | - | - | - |
| | | Develop ethical and social awareness about environmental degradation and control. | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | - | - | - |
| CC122 | Computer Workshop | Understand basics of computer hardware | 1 | 1 | 1 | - | 1 | - | - | 2 | 1 | - | 1 | 2 | - | - | - | |
| | | Install operating systems, drivers related to hardware and other software | 1 | 1 | 1 | - | 2 | - | - | - | 2 | 1 | - | 1 | 2 | - | - | - |

Outcome Based Education (OBE)

| Subject Code | Subject Name | Course Outcomes | P01 | P02 | P03 | P04 | P05 | P06 | P07 | P08 | P09 | P010 | P011 | P012 | PS01 | PS02 | PS03 |
|--------------|---------------------|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| | | Configure operating system for effective management of resources | 1 | 1 | 1 | 1 | 2 | 1 | - | 2 | 2 | - | 1 | 2 | - | - | - |
| | | Manage security related basic problem using anti-virus software | 1 | 1 | 1 | 1 | 2 | 2 | 1 | 2 | 1 | - | 1 | 2 | - | - | - |
| | | Create reports, presentation, and spread sheets | 1 | 1 | 1 | 1 | 2 | - | - | 2 | 1 | 3 | 1 | 2 | - | - | - |
| | | Work with various tools for collaboration and website creation | 1 | 2 | 1 | 1 | 3 | 1 | 1 | 2 | 1 | 1 | 1 | 2 | - | - | - |
| CC143 | Engineering Physics | Apply the Basic Laws of Physics in Quantum Mechanics, to understand the concepts of wave particle duality, black body Radiation De-Broglie's hypothesis and uncertainty Principle. Understand the working principle of a Laser and Optical Fibre communication, their components, working of different Laser systems and their engineering applications | 3 | 1 | - | - | - | 2 | - | - | - | - | - | 1 | - | - | - |
| | | | 2 | 2 | 1 | 1 | - | - | 1 | - | - | - | - | 1 | - | - | - |

| Subject Code | Subject Name | Course Outcomes | P01 | P02 | P03 | P04 | P05 | P06 | P07 | P08 | P09 | P010 | P011 | P012 | PS01 | PS02 | PS03 |
|--------------|------------------------------------|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| | | Apprise observation, experiment and theory work together to continue to expand the frontiers of knowledge of the Engineering Physics in the field of superconductivity | 2 | 2 | 2 | - | - | 2 | 2 | - | - | - | - | 1 | - | - | - |
| | | Understand the basics of Acoustics and Ultrasonic and their applications | 2 | 1 | 2 | - | - | - | - | - | - | - | - | - | - | - | - |
| | | Understand basic concepts of Nanophysics and their various applications. | 2 | 1 | 1 | 1 | - | 1 | 2 | - | - | - | - | - | - | - | - |
| | | Ability to identify engineering problems related to Engineering Physics. | 2 | 2 | 1 | 1 | - | - | - | - | - | - | - | - | - | - | - |
| CC152 | Elements of Mechanical Engineering | Use the concepts of units, systems (open, closed systems and control volumes) and its boundaries, properties, state, process, cycle, quasi-static process in context of energy conversion. | 3 | 2 | 1 | - | - | - | - | - | - | - | - | - | - | - | - |
| | | Assess thermodynamic properties of gases and steam, and apply it to systems of relevance. | 3 | 2 | 1 | - | - | - | - | - | - | - | - | - | - | - | - |

Outcome Based Education (OBE)

| Subject Code | Subject Name | Course Outcomes | P01 | P02 | P03 | P04 | P05 | P06 | P07 | P08 | P09 | P010 | P011 | P012 | PS01 | PS02 | PS03 | |
|--------------|----------------------|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|---|
| | | Interpret the fundamentals of I C engine and air compressors. | 3 | 2 | 1 | - | - | - | - | - | - | - | - | - | - | - | - | |
| | | Interpret the fundamentals of pumps, refrigerators and air-conditioners. | 3 | 1 | 1 | - | - | - | - | - | - | - | - | - | - | - | - | |
| | | Identify the transmission systems and its components. | 3 | 1 | 1 | - | - | - | - | - | - | - | - | - | - | - | - | |
| CC171 | Communication Skills | Acquire Presentation skills and Group Discussion skills | - | - | - | - | - | 1 | - | 2 | 3 | 3 | - | 2 | - | - | - | |
| | | Acquire knowledge of communication and its components | - | - | - | - | - | 1 | - | 2 | 3 | 3 | - | 2 | - | - | - | |
| | | Improve language skills – LSRW | - | - | - | - | - | - | 1 | - | 2 | 3 | 3 | - | 2 | - | - | - |
| | | Develop basic and intermediate competency in English language | - | - | - | - | - | - | 2 | - | 2 | 3 | 3 | - | 2 | - | - | - |
| | | Overcome communication phobia in English | - | - | - | - | - | - | 1 | - | 2 | 3 | 3 | - | 2 | - | - | - |
| | | Acquire Presentation skills and Group Discussion skills. | - | - | - | - | - | - | 2 | - | 2 | 3 | 3 | - | 2 | - | - | - |
| | | Get acquainted to literature to acquire necessary life skills. | - | - | - | - | - | 3 | - | 2 | 3 | 3 | - | 2 | - | - | - | |

| Subject Code | Subject Name | Course Outcomes | P01 | P02 | P03 | P04 | P05 | P06 | P07 | P08 | P09 | P010 | P011 | P012 | PS01 | PS02 | PS03 |
|-------------------|------------------------------------|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| | | Feel confident to communicate in English & Receive knowledge of formal letter writing. | - | - | - | - | - | 1 | - | 2 | 3 | 3 | - | 2 | - | - | - |
| SEMESTER-2 | | | | | | | | | | | | | | | | | |
| CC102 | Vector Calculus and Linear Algebra | Solve system of linear equations using different tools of linear algebra for the problems | 3 | - | 1 | 1 | 2 | - | - | - | - | 1 | - | 3 | - | - | - |
| | | Use Eigen values and Eigen vector in different subjects of engineering like control theory, vibration analysis, electric circuits, advanced dynamics and quantum mechanics. | 3 | 1 | 2 | 2 | 1 | 1 | 1 | - | - | - | 2 | - | 2 | - | - |
| | | Apply vectors in higher dimensional space in experimental data, storage and warehousing. | 3 | 2 | 3 | 2 | 1 | 2 | 3 | - | 2 | 2 | - | 2 | - | - | - |
| | | Apply linear transformation in subject like computer graphics, cryptography, thermodynamics etc. | 2 | 2 | 2 | 2 | 1 | 2 | 3 | - | 2 | 1 | - | 2 | - | - | - |

Outcome Based Education (OBE)

| Subject Code | Subject Name | Course Outcomes | P01 | P02 | P03 | P04 | P05 | P06 | P07 | P08 | P09 | P010 | P011 | P012 | PS01 | PS02 | PS03 |
|--------------|----------------------|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| | | Apply differential and integral vector calculus to the problems in R^3 . | 2 | 2 | 3 | 1 | 1 | 2 | 1 | 2 | 2 | 2 | - | 2 | - | - | - |
| | | Use the techniques and theory of linear algebra to model various real world problems. | 2 | 3 | 3 | 2 | 3 | 2 | 3 | 2 | 3 | 2 | - | 3 | - | - | - |
| | | Explain different features (keywords, constructs, functions, pointers, etc...) of programming language. | 1 | 1 | 1 | 1 | - | - | - | 2 | 1 | 1 | - | 1 | - | - | - |
| | | Break-up a medium (or large) problem into smaller sub-problems to make it tractable for a possible solution through computer programming. | 2 | 2 | 3 | 1 | - | - | 2 | 2 | 2 | 1 | 2 | 2 | - | - | - |
| CC121 | Computer Programming | Represent and communicate a conceived solution to a problem in a systematic way using the tools of algorithms and flow-charts | 2 | 2 | 2 | 1 | 3 | - | - | 2 | 2 | 3 | 2 | 2 | - | - | - |
| | | Use different features of C programming language to develop a possible programming solution to a given problem in each domain | 3 | 2 | 3 | 1 | 3 | - | 1 | 2 | 2 | 1 | 1 | 1 | - | - | - |

| Subject Code | Subject Name | Course Outcomes | P01 | P02 | P03 | P04 | P05 | P06 | P07 | P08 | P09 | P010 | P011 | P012 | PS01 | PS02 | PS03 | |
|--------------|-----------------------------|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|---|
| | | Decipher a given C program of simple to moderate complexity and determine the output. | 3 | 3 | 2 | 1 | 3 | - | - | 2 | 1 | 1 | 1 | 1 | - | - | - | |
| | | Identify syntactical and semantic errors in given C program. | 3 | 3 | 2 | 1 | 2 | - | - | 2 | 1 | 1 | 1 | 1 | - | - | - | |
| CC131 | Basic electrical Technology | Assess the knowledge about the electric and magnetic circuits. | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 1 | 1 | - | - | - | |
| | | Practice the fundamentals of AC supply systems and their applications. | 3 | 2 | 2 | 1 | 3 | 3 | 1 | 2 | 2 | 2 | 2 | 1 | 1 | - | - | - |
| | | Interpret the working and applications of various electrical machines. | 2 | 2 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | - | - | - |
| | | Associate the knowledge about various measuring instruments and wiring system. | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 1 | 1 | - | - | - |
| | | Comprehend the advance subjects of electrical engineering. | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | - | - | - |

Outcome Based Education (OBE)

| Subject Code | Subject Name | Course Outcomes | P01 | P02 | P03 | P04 | P05 | P06 | P07 | P08 | P09 | P010 | P011 | P012 | PS01 | PS02 | PS03 | |
|--------------|-----------------------------|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|---|
| CC141 | Fundamentals of Electronics | Identify the applications and functions of electronics in Engineering. | 3 | 2 | - | - | 1 | - | - | - | - | - | - | - | - | - | - | |
| | | Acquire knowledge about semiconductor physics for intrinsic and extrinsic materials. | 3 | 2 | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - |
| | | Understand the basic of semiconductor diodes, BJTs and their small signal | 3 | 2 | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - |
| | | Analyse the performance of BJTs on the basic of them operation and working. | 3 | 2 | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - |
| | | Gain idea about CMOS structure and Operation of MOS transistor. | 3 | 2 | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - |
| | | Analyse and Design the operational amplifiers circuits. | 3 | 2 | - | - | 1 | - | - | - | - | - | - | - | - | - | - | - |
| | | Build a small electronic circuit. | 3 | 1 | 1 | - | - | 1 | 1 | 1 | - | 2 | - | - | - | - | - | - |
| CC142 | Electronics workshop | Identification and testing of basic electronics Components. | 2 | 3 | 3 | 2 | 2 | - | 1 | - | - | - | - | 2 | - | - | - | |
| | | Use of analogy and digital instruments for troubleshooting. | 2 | 2 | 2 | 1 | 3 | - | - | - | - | - | - | 1 | - | - | - | |
| | | | | | | | | | | | | | | | | | | |

| Subject Code | Subject Name | Course Outcomes | P01 | P02 | P03 | P04 | P05 | P06 | P07 | P08 | P09 | P010 | P011 | P012 | PS01 | PS02 | PS03 | | |
|--------------|----------------------|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|---|---|
| | | Understand the operating function about basic instruments like CRO, Digital Storage Oscilloscope Power Supply, Function Generator and Digital Multi meter etc. | 1 | 2 | 3 | 2 | 2 | - | 1 | - | 3 | - | 2 | - | - | - | - | | |
| | | Design and development of PCB and soldering of components. | 3 | 2 | 3 | 1 | 3 | - | - | 1 | 2 | 1 | 2 | 3 | - | - | - | | |
| CC151 | Engineering Graphics | Interpret standard conventions used in engineering drawing and construction of plain and diagonal scales. | 3 | 2 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | | |
| | | Construct orthographic and isometric projections. | 3 | 2 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| | | Construct various engineering curves and identify its various applications. | 3 | 2 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | | Construct projections of points and straight lines. | 3 | 2 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | | Interpret different planes and solids and construct their projection. | 3 | 2 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | | Create sections of solids and develop surfaces. | 3 | 2 | 2 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

| Subject Code | Subject Name | Course Outcomes | P01 | P02 | P03 | P04 | P05 | P06 | P07 | P08 | P09 | P010 | P011 | P012 | PS01 | PS02 | PS03 | |
|--------------|--|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|---|
| CC174 | Value Education, Human Rights and Legislative Procedures | Inculcate the core Values of education | - | - | - | - | - | 2 | 2 | 3 | 2 | 2 | 2 | 2 | - | - | - | |
| | | Trigger their social behaviour and Personality | - | - | - | - | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | - | - | - | |
| | | Civilize in the societal settings | - | - | - | - | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 3 | 2 | - | - | - |
| | | Adopt moral behaviour and act accordingly. | - | - | - | - | 2 | 2 | 3 | 2 | 3 | 2 | 2 | 3 | 2 | - | - | - |

SEMESTER-3

| | | | | | | | | | | | | | | | | | | |
|--------------|----------------------------------|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MA201 | Advanced Engineering Mathematics | Do expansion of functions in terms of basic trigonometric functions. | 2 | 2 | - | - | - | - | - | - | 1 | 2 | 2 | 2 | - | - | - | |
| | | Analyse differential equations. | 3 | 3 | - | - | - | - | - | - | - | 1 | 2 | 2 | - | - | - | |
| | | Solve differential equations by using tool like Laplace transform, Fourier series and series solution. | 2 | 2 | - | - | - | - | - | - | - | 1 | 2 | 2 | 2 | - | - | - |
| | | Create a modelling of engineering problems. | 3 | 3 | - | - | - | - | - | - | - | 1 | 2 | 2 | 2 | - | - | - |

| Subject Code | Subject Name | Course Outcomes | P01 | P02 | P03 | P04 | P05 | P06 | P07 | P08 | P09 | P010 | P011 | P012 | PS01 | PS02 | PS03 | |
|--------------|---------------------|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|---|
| EL201 | Signals and Systems | Understand the analytical frame work, mathematical description and representation of Signals. | 3 | 1 | 2 | 1 | 2 | - | - | 1 | 2 | - | - | 3 | 1 | 2 | - | |
| | | Derive and examine a fundamental representation of LTI systems. | 3 | 1 | 2 | 1 | 2 | - | - | - | 1 | 2 | - | - | 3 | - | 1 | - |
| | | Understand and analyse the representation of periodic signals in continuous and discrete time. | 3 | 3 | 2 | 1 | 2 | - | - | - | 1 | 2 | - | - | 3 | - | 1 | - |
| | | Understand and analyse the representation of aperiodic signals in continuous and discrete time. | 3 | 3 | 2 | 1 | 2 | - | - | - | 1 | 2 | - | - | 3 | - | 1 | - |
| | | Relate time - domain and frequency - domain characteristics of the LTI systems. | 3 | 3 | 2 | 1 | 2 | - | 1 | 1 | 2 | - | - | 3 | - | 1 | - | |
| | | Understand the concept of sampling of a signal and reconstruction of a signal from the samples. | 3 | 3 | 2 | 1 | 2 | - | 1 | 1 | 2 | - | - | 3 | 3 | 1 | - | |
| | | Understand the generalization of frequency representation of continuous time and discrete time systems. | 3 | 3 | 2 | 1 | 2 | - | 1 | 1 | 2 | - | - | 3 | 3 | - | - | |

Outcome Based Education (OBE)

| Subject Code | Subject Name | Course Outcomes | P01 | P02 | P03 | P04 | P05 | P06 | P07 | P08 | P09 | P010 | P011 | P012 | PS01 | PS02 | PS03 |
|--------------|-------------------------|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| EL202 | Linear Circuit Analysis | Apply various circuit laws, theorems and analysis techniques. | 3 | 2 | 1 | - | 1 | - | - | - | 1 | 1 | - | 1 | 3 | - | 1 |
| | | Analyse behaviour of passive circuits such as RC, RL and RLC. | 3 | 2 | 1 | - | 1 | - | - | - | - | 1 | 1 | - | 3 | - | 1 |
| | | Apply Laplace Transform for circuit analysis. | 3 | 2 | 1 | - | 1 | - | - | - | - | 1 | 1 | - | 3 | - | 1 |
| | | Analyse circuit in the S- Domain | 3 | 2 | 1 | - | 1 | - | - | - | - | 1 | 1 | - | 3 | - | 1 |
| | | Study various two port networks. | 3 | 2 | 1 | - | 1 | - | - | - | - | 1 | 1 | - | 3 | - | 1 |
| | | | | | | | | | | | | | | | | | |
| EL203 | Analog Electronics | Understand the basics of BJTs and MOS circuits. | 3 | 2 | - | - | 1 | - | - | - | - | - | - | - | 1 | 1 | 2 |
| | | Analyse the multistage amplifiers and understand its frequency response. | 3 | 2 | - | - | 1 | - | - | - | - | - | - | - | 1 | 1 | 2 |
| | | Analyse and Design the performance of negative feedback circuits and Oscillators. | 3 | 2 | - | - | 1 | - | - | - | - | - | - | - | 1 | 1 | 2 |
| | | Understand the use of op-amp using MOS. | 3 | 2 | - | - | 1 | - | - | - | - | - | - | - | 1 | 1 | 2 |
| | | Analyse the power amplifiers and wave shaping circuits. | 3 | 2 | - | - | 1 | - | - | - | - | - | - | - | 1 | 1 | 2 |
| | | | | | | | | | | | | | | | | | |
| EL204 | Digital Electronics | Understand digital number systems and logic gates. | 3 | 3 | 1 | - | - | - | - | - | - | - | - | - | 1 | 2 | 1 |
| | | Analyse logic function minimization. | 1 | 3 | 2 | - | - | - | - | - | - | - | - | - | 1 | 2 | 1 |
| | | Design combinational and sequential circuits. | 1 | 3 | 3 | 1 | - | - | - | - | - | - | - | - | 1 | 3 | 2 |

| Subject Code | Subject Name | Course Outcomes | P01 | P02 | P03 | P04 | P05 | P06 | P07 | P08 | P09 | P010 | P011 | P012 | PS01 | PS02 | PS03 | |
|-------------------|--------------------------------------|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|---|
| | | Design simple digital circuits using FSM. | 2 | 3 | 3 | 1 | 1 | - | - | - | - | - | - | - | 1 | 2 | 3 | |
| | | To study the functions of various digital integrated circuits and ADC, DAC. | 1 | 3 | 1 | 1 | 2 | - | - | - | - | - | - | - | 1 | 3 | 2 | |
| | | Simulate digital circuits using Hardware descriptive language. | 2 | 3 | 3 | 1 | 3 | - | - | - | - | - | - | - | 3 | 2 | 3 | |
| MA202 | Professional Soft Skills | Understand organizational structure. | - | - | 1 | - | - | - | 1 | 2 | 3 | 3 | 0 | 2 | - | - | - | |
| | | Promote professionalism. | - | - | 1 | - | - | 2 | 2 | 2 | 2 | 3 | 3 | 1 | 2 | - | - | - |
| | | Enhance advanced level of communication with special focus on organizational structure. | - | - | 1 | - | - | - | - | - | 3 | 3 | 3 | 2 | 2 | - | - | - |
| | | Enhance their presentations style and their ability to deal with the variety of organizational communication i.e. presentations, conferences, meetings, interviews and the other. | - | - | 0 | - | - | - | 1 | 2 | 2 | 3 | 2 | 3 | - | - | - | |
| SEMESTER-4 | | | | | | | | | | | | | | | | | | |
| MA203 | Engineering Economics and Management | Understand and apply the basics of economics and management to engineering areas. | 3 | 3 | 2 | - | - | 2 | 1 | 1 | 1 | 1 | 1 | 3 | -- | -- | -- | |

Outcome Based Education (OBE)

| Subject Code | Subject Name | Course Outcomes | P01 | P02 | P03 | P04 | P05 | P06 | P07 | P08 | P09 | P010 | P011 | P012 | PS01 | PS02 | PS03 |
|--------------|-------------------------------|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| | | Understand and apply the basics of demand, demand forecasting, elasticity et al. to engineering projects. | 3 | 3 | 2 | - | - | 2 | 1 | 1 | 1 | 1 | 1 | 3 | -- | -- | -- |
| | | Apply the basics of project planning project evaluation break even depreciation and costing and et al to engineering. | 3 | 3 | 2 | - | - | 2 | 1 | 1 | 1 | 3 | 3 | 3 | -- | -- | -- |
| | | Understand product development product life cycle and its advantages to the organization. | 3 | 3 | 2 | - | - | 2 | 1 | 1 | 1 | 1 | 1 | 3 | -- | -- | -- |
| | | Understand quality concepts. | 3 | 3 | 2 | - | - | 2 | 1 | 1 | 1 | 1 | 1 | 3 | -- | -- | -- |
| | | Understand human resource development recruitment and training and its advantages to the organization. | 3 | 3 | 2 | - | - | 2 | 1 | 1 | 1 | 1 | 1 | 3 | -- | -- | -- |
| EL205 | Electro magnetic Field Theory | Understand and apply Maxwell's equations in governing electric and magnetic forces. | 3 | - | - | 2 | - | - | - | - | 3 | - | - | - | - | - | - |
| | | Calculate line parameters, characteristic impedance and propagation constants for coaxial, two-wire, parallel plate and micro strip transmission lines. | 1 | 3 | 3 | 2 | 3 | - | - | - | 3 | - | - | - | - | - | - |

| Subject Code | Subject Name | Course Outcomes | P01 | P02 | P03 | P04 | P05 | P06 | P07 | P08 | P09 | P010 | P011 | P012 | PS01 | PS02 | PS03 |
|--------------|-----------------|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| | | Apply vector calculus for solving electromagnetic problems of gradient, divergence and curl operations. | 2 | 3 | - | 3 | - | - | - | - | 3 | - | - | - | - | - | - |
| | | Understand Coulomb' and Gauss laws and apply them to electrostatic problems. | 1 | 3 | 3 | 3 | 2 | - | - | - | 3 | - | - | - | - | - | - |
| | | Understand Biot-Savart and Ampere laws and apply them to magneto static problems. | 1 | - | - | 3 | - | - | - | - | 3 | - | - | - | - | - | - |
| EL206 | Control Systems | Understanding of basic linear feedback principles and find out the transfer function using various methods. | 1 | 1 | - | - | - | 1 | 1 | 3 | 3 | 3 | 1 | 3 | 1 | - | - |
| | | Able to represent Mathematical model for different physical system determine conditions that guarantee the linear system stability. | 3 | 1 | - | 1 | 2 | - | - | - | 3 | 3 | 3 | 1 | 3 | - | - |
| | | Able to design system with controller to improve system transient and steady state response | 3 | 2 | 2 | 1 | 2 | - | - | - | 3 | 3 | 3 | 1 | 3 | 1 | 1 |

Outcome Based Education (OBE)

| Subject Code | Subject Name | Course Outcomes | P01 | P02 | P03 | P04 | P05 | P06 | P07 | P08 | P09 | P010 | P011 | P012 | PS01 | PS02 | PS03 |
|--------------|----------------------|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| | | Able to sketch the static feedback root locus and determine the location of the closed-loop poles. | 3 | 2 | 2 | 1 | 2 | - | - | 3 | 3 | 3 | 1 | 3 | 1 | 1 | 1 |
| | | Able to draw Nyquist plots, bode plots and find stability margins. | 3 | 2 | 2 | 2 | 2 | - | - | 3 | 3 | 3 | 1 | 3 | 1 | 1 | 1 |
| | | Able to present and analyse linear control system using the state space technique | 3 | 2 | 2 | 2 | 2 | - | - | 3 | 3 | 3 | 1 | 3 | 1 | 1 | 1 |
| | | Understand Basic Communication System and noise present in systems. | 3 | - | - | - | - | - | 2 | 2 | 1 | - | - | - | - | - | - |
| | | Evaluate fundamental communication system factors, such as bandwidth, power and signal to quantization noise ratio. | 3 | 3 | - | - | - | - | - | 2 | 2 | - | - | - | - | - | - |
| | Analog Communication | Able to describe classification of elementary signals and noise with different noise parameter like noise factor, noise temperature and noise bandwidth. | 3 | 3 | - | - | - | - | - | 2 | 2 | - | - | - | - | - | - |
| | | Use Fourier transforms for frequency analysis of communication systems. | 3 | 2 | - | 2 | - | - | - | 2 | 2 | 3 | - | - | - | - | - |

EL207

| Subject Code | Subject Name | Course Outcomes | P01 | P02 | P03 | P04 | P05 | P06 | P07 | P08 | P09 | P010 | P011 | P012 | PS01 | PS02 | PS03 | |
|--------------|---|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|---|
| | | Examine basic types of modulation scheme for analog communication (AM, FM, PM). | 3 | - | 2 | - | - | - | - | 2 | 2 | 3 | - | 2 | - | - | - | |
| EL208 | Micro Controllers and Applications | Explore Architecture and practice related to basic Microcontroller. | - | - | 1 | 2 | - | 3 | 1 | - | - | - | - | 1 | - | - | - | |
| | | Program the microprocessors and microcontrollers. | - | - | - | - | 2 | 3 | 1 | 1 | - | - | - | - | 1 | - | - | - |
| | | Able to design Microcontrollers based systems. | - | - | - | 1 | - | 3 | 1 | 1 | - | - | - | - | 3 | - | - | - |
| | | Use software tools to simulate and ability to analyse the peripherals interfacing Design of microcontroller based Systems, and use it in applications. | - | - | 2 | 3 | 2 | 1 | 2 | 1 | 1 | - | - | - | - | 3 | - | 2 |
| | | Ability to identify, formulate and solve engineering problems related to microprocessor and microcontroller applications. | - | - | 1 | 2 | 1 | 2 | 1 | - | 2 | - | - | 3 | - | 2 | - | |
| EL209 | Electronic Measurements and Instrumentation | Understand the terminology of instruments. | 3 | 2 | - | - | - | 3 | - | - | - | - | - | - | - | - | - | |
| | | Understand the sensors. | - | 3 | 2 | - | 3 | 2 | - | - | - | - | - | - | - | - | - | - |
| | | Apply the transducers for various electronic applications. | - | - | 3 | - | - | 2 | 1 | 1 | - | - | - | 2 | - | - | - | - |

Outcome Based Education (OBE)

| Subject Code | Subject Name | Course Outcomes | P01 | P02 | P03 | P04 | P05 | P06 | P07 | P08 | P09 | P010 | P011 | P012 | PS01 | PS02 | PS03 | |
|-------------------|---------------------------------------|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|---|
| | | Able to apply signal conditioning for measurements. | - | - | - | - | - | 3 | 1 | - | - | - | - | - | - | - | - | |
| | | Explain various measurements techniques for industrial and laboratory applications of various transducers. | - | - | - | - | - | - | - | - | - | 2 | 3 | - | 3 | - | 2 | |
| EL210 | Electronic Design and Automated Tools | Use software tools like NGSpice/LTSpice/Multisim/Orcad. | 2 | 1 | 3 | 1 | 3 | - | - | - | - | - | - | - | 2 | 3 | 3 | |
| | | Simulate various analog and digital circuits using NGSpice/LTSpice/Multisim/Orcad. | 2 | 1 | 3 | 1 | 3 | - | - | - | - | - | - | - | 2 | 3 | 3 | |
| | | Design PCB for given circuit using PCB Software like EAGLE, Express PCB, OrCAD. | 1 | - | 2 | 1 | 3 | - | - | - | - | - | - | - | 2 | 3 | 3 | |
| SEMESTER-5 | | | | | | | | | | | | | | | | | | |
| EL301 | Digital Communication | Analyse different baseband modulation techniques like PCM, DM, ADM. | 3 | 1 | - | - | 2 | - | - | 1 | 1 | - | - | 3 | - | - | - | |
| | | Analyse the concept of ISI and reduction of ISI through Nyquist criteria. | 3 | 1 | 1 | - | 2 | - | - | - | 1 | 1 | - | - | 3 | - | - | - |
| | | Compare various digital modulation-demodulation techniques | 3 | 2 | 2 | 1 | 2 | - | - | - | 1 | 1 | - | - | 3 | 1 | 1 | - |

| Subject Code | Subject Name | Course Outcomes | P01 | P02 | P03 | P04 | P05 | P06 | P07 | P08 | P09 | P010 | P011 | P012 | PS01 | PS02 | PS03 | |
|--------------|------------------------------|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|---|
| | | Understand probability, random variable and various statistical analysis methods. | 3 | 2 | 2 | 1 | 2 | - | - | 1 | 1 | - | - | 3 | - | - | - | |
| | | Derive channel capacity for discrete memory less channel and continuous channel. | 3 | 2 | 2 | 1 | 2 | - | - | 1 | 1 | - | - | 3 | - | 1 | - | |
| EL302 | Analog Circuit Design | Understand basic characteristics of op-amp. | 3 | 3 | 3 | 1 | 2 | 2 | - | - | 1 | 1 | - | 2 | 1 | 1 | 1 | |
| | | Analyse the basic block diagram and datasheets for op-amp. | 3 | 2 | 2 | - | 2 | - | - | - | - | 1 | - | - | 2 | - | - | - |
| | | Design the op-amp's linear, non-linear circuits and active filters applications. | 3 | 3 | 3 | 1 | 2 | 2 | - | - | - | 1 | 1 | - | 2 | 1 | 1 | 1 |
| | | Test and Analyse special purpose ICs and their application circuits. | 3 | 3 | 3 | 1 | 2 | 2 | - | - | - | 1 | 1 | - | 2 | 1 | 1 | 1 |
| EL303 | Antenna and Wave Propagation | Apply Antenna theory to design various antennas. | 3 | 3 | 1 | 1 | - | 1 | - | 1 | 1 | 2 | - | 3 | 1 | 1 | - | |
| | | Analyse and measure the fundamental antenna parameters. | 3 | 1 | 1 | 1 | - | 1 | 1 | 1 | 1 | 1 | 2 | - | 3 | 1 | 1 | - |
| | | Design various antennas performance using Electromagnetic Simulators. | 3 | 1 | 3 | 3 | 3 | 1 | 1 | 1 | 1 | 1 | 2 | - | 3 | 2 | 1 | - |

Outcome Based Education (OBE)

| Subject Code | Subject Name | Course Outcomes | P01 | P02 | P03 | P04 | P05 | P06 | P07 | P08 | P09 | P010 | P011 | P012 | PS01 | PS02 | PS03 | |
|--------------|-----------------------------|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|---|
| | | Understand and analyse the operation of different types of antennas. | 3 | 3 | 2 | 3 | 2 | 1 | 1 | 1 | 1 | 2 | - | 3 | 3 | 1 | - | |
| EL304 | Advanced Micro Controller | Knowledge of Architecture and practice related to various Microcontrollers available in the market today. | - | - | 3 | 1 | - | - | 1 | - | - | - | - | 1 | - | - | 2 | |
| | | Understand and analyse the various design challenges and techniques for solution by Microcontrollers based designs. | - | - | 1 | 3 | 2 | 1 | - | 1 | - | - | - | - | 1 | 2 | 2 | 2 |
| | | Use software tools to simulate and analyse the performance of Design of microcontroller based Systems, and use it in real time applications. | - | - | - | - | 3 | 2 | 1 | 1 | - | - | - | - | 1 | - | 2 | 2 |
| | | Ability to identify, formulate and solve engineering problems related to Real time Electronics design solutions. | - | - | - | 1 | 2 | 1 | - | - | - | - | - | 2 | 3 | 2 | 3 | |
| EL305 | Guided Research and Reading | Guided research reading helps students to understand texts and to use a range of reading and thinking strategies on other texts. | 3 | 1 | - | 2 | - | 3 | - | - | - | - | - | - | - | - | - | |

| Subject Code | Subject Name | Course Outcomes | P01 | P02 | P03 | P04 | P05 | P06 | P07 | P08 | P09 | P010 | P011 | P012 | PS01 | PS02 | PS03 |
|--------------|---------------------------|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| | | Assessment that emerges from the classroom rather than being imposed upon it is integral to guided reading. | 2 | 2 | 2 | 3 | 2 | 2 | 1 | - | - | - | - | - | 1 | - | - |
| | | Guided reading requires that comprehension strategies be modelled by teachers and that students be encouraged to use them independently before, during, and after their reading of a text. | 2 | 2 | 2 | 3 | 2 | 2 | 1 | - | - | - | - | - | - | 2 | - |
| | | Guided reading is much more than a set of activities to work through. An understanding of the theoretical underpinnings is essential. | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 1 | - | 2 | - | 2 | - | - | - |
| | | Understand the power semiconductor devices. | 3 | 1 | 2 | 2 | 2 | - | - | 1 | - | - | - | - | 1 | 2 | 1 |
| | Power Drivers and Drivers | Design and analyse various SCR firing, commutation methods and Phase controlled rectifiers. | 2 | 1 | 3 | 1 | 1 | - | 1 | - | - | 1 | 2 | - | 1 | 3 | - |
| EL351 | Electronics and Drivers | Design and understand the operation of various industrial based power electronics circuits like inverters, choppers and Cycloconverters. | 1 | 3 | 3 | - | 2 | 1 | - | - | 2 | - | - | - | - | 2 | 2 |

Outcome Based Education (OBE)

| Subject Code | Subject Name | Course Outcomes | P01 | P02 | P03 | P04 | P05 | P06 | P07 | P08 | P09 | P010 | P011 | P012 | PS01 | PS02 | PS03 | |
|-------------------|-----------------------|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|---|
| | | Foster ability to understand the use of DC drives and AC drives in industrial applications. | 2 | 2 | 1 | 1 | - | - | - | 1 | 2 | - | 2 | - | 2 | 3 | - | |
| EL352 | Digital System Design | Understand Hardware Descriptive Language and different design methodology. | 3 | 3 | 1 | 1 | - | - | - | - | - | - | - | 2 | 2 | 3 | 2 | |
| | | Design Combinational and sequential circuits using HDL. | 3 | 1 | 1 | 1 | - | - | - | - | - | - | - | - | 2 | 2 | 3 | 2 |
| | | Design synchronous circuits using FSM and analyse Asynchronous circuits and timing | 3 | 3 | 2 | 3 | 2 | - | - | - | - | - | - | - | 2 | 2 | 3 | 1 |
| | | | 3 | 2 | 2 | 2 | 2 | - | - | - | - | - | - | - | 2 | 2 | 3 | 3 |
| SEMESTER-6 | | | | | | | | | | | | | | | | | | |
| EL306 | VLSI Design | Understand VLSI design flow and different design methodology. | 3 | 3 | 1 | 1 | - | - | - | - | - | - | - | - | 2 | 1 | 1 | 1 |
| | | Understand fabrication process of MOSFETs and CMOS. | 3 | 1 | 1 | 1 | - | - | - | - | - | - | - | - | 2 | 1 | 1 | 1 |
| | | Understand MOS theory. | 3 | 3 | 2 | 3 | 2 | - | - | - | - | - | - | - | 1 | 3 | 1 | 1 |
| | | Analyse the CMOS construction & its characteristics. | 3 | 2 | 2 | 2 | 2 | - | - | - | - | - | - | - | 3 | 3 | 2 | 2 |
| | | Apply CMOS fundamentals to design CMOS based digital circuits. | 3 | 2 | 1 | 1 | 2 | - | - | - | - | - | - | 3 | 3 | 2 | 2 | |

| Subject Code | Subject Name | Course Outcomes | P01 | P02 | P03 | P04 | P05 | P06 | P07 | P08 | P09 | P010 | P011 | P012 | PS01 | PS02 | PS03 | |
|--------------|---------------------------|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|---|
| EL307 | Digital Signal Processing | Understands the fundamentals, implementations and application of DSP. | 3 | 1 | - | - | 2 | - | - | 2 | 2 | - | - | 3 | 1 | - | - | |
| | | Understand applications of z- transforms. | 3 | 1 | - | - | 2 | - | - | 2 | 2 | - | - | - | 3 | 1 | - | - |
| | | Design the digital filters. | 3 | 2 | 2 | 1 | 2 | - | - | - | 2 | 2 | - | - | 3 | 1 | 2 | 2 |
| | | Analysis of the frequency response of discrete-time signals and systems. | 3 | 3 | 2 | 1 | 3 | - | - | - | 2 | 2 | - | - | 3 | 1 | 2 | 2 |
| | | Develop programs using software tools for DSP algorithms. | 3 | 3 | 2 | 1 | 2 | - | - | - | 2 | 2 | - | - | 3 | 1 | 1 | 2 |
| | | Understand the difference between fixed point and floating point digital signal processor and select them as per requirement of applications | 3 | 3 | 2 | 1 | 2 | - | - | - | 2 | 2 | - | - | 3 | 1 | 1 | 2 |
| EL308 | Microwave Engineering | To understand TE, TM, TEM mode propagation, advantages and applications of microwaves. | 1 | - | - | - | - | 1 | 1 | - | - | - | - | 1 | 1 | - | - | |
| | | To understand, analyse and solve problems related microwave transmission line. | 3 | 3 | 2 | 1 | 1 | - | - | - | - | - | - | - | 1 | 1 | 2 | 1 |

Outcome Based Education (OBE)

| Subject Code | Subject Name | Course Outcomes | P01 | P02 | P03 | P04 | P05 | P06 | P07 | P08 | P09 | P010 | P011 | P012 | PS01 | PS02 | PS03 | |
|--------------|--------------|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|---|
| | | To understand and analyse the concept of various active and passive microwave components for different applications. | 2 | 1 | - | 1 | - | - | - | - | - | - | - | 1 | 1 | - | - | |
| | | To understand the concept of various microwave tube devices. | 1 | - | - | - | - | - | - | - | - | - | - | 1 | 1 | - | - | |
| | | Measurements of various parameters of microwave systems. | 2 | 2 | 1 | 1 | - | - | - | - | - | - | - | - | - | - | - | |
| | | Recent trends of microwave engineering, various applications, and health hazards. | 1 | - | 1 | - | 1 | 1 | 3 | - | - | - | - | 1 | 2 | - | 1 | |
| EL341 | Mini Project | Students will be able to practice acquired knowledge within the chosen area of technology for project development. | 1 | 1 | 2 | - | - | - | - | - | - | - | - | 1 | 2 | - | - | |
| | | Identify, discuss and justify the technical aspects of the chosen project with a comprehensive and systematic approach. | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | 2 |
| | | Reproduce, improve and refine technical aspects for engineering projects. | - | - | - | - | - | - | - | - | - | 2 | 1 | - | - | 1 | - | - |

| Subject Code | Subject Name | Course Outcomes | P01 | P02 | P03 | P04 | P05 | P06 | P07 | P08 | P09 | P010 | P011 | P012 | PS01 | PS02 | PS03 |
|--------------|-----------------------------|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| | | Work as an individual or in a team in development of technical projects. | - | 1 | 3 | - | 2 | - | - | - | - | - | - | 1 | - | 2 | 1 |
| | | Communicate and report effectively project related activities and findings | - | - | - | - | - | - | 1 | - | - | 2 | 2 | - | 1 | 1 | 2 |
| | | Understand the role of different types of digital PID controller and its realization in control system design. | 3 | 1 | 2 | 1 | - | 2 | - | - | - | - | - | - | - | - | - |
| | | Understand the methodology of feedback control system and different types of stability analysis for them. | 3 | 1 | 2 | 1 | 2 | - | - | - | - | - | - | - | - | - | - |
| | | Identify, formulate digital control system, and analyse optimal control system. | 3 | 3 | 2 | 1 | - | - | 1 | - | - | - | - | - | - | - | - |
| | | Understand of digital control system and able to predict system behaviour. | 3 | 2 | 2 | 1 | - | - | - | 1 | - | - | - | - | - | - | - |
| | | Understand the basic elements of optical fibre transmission link, fibre modes and structure configurations. | 3 | 2 | 2 | 2 | 1 | 1 | - | - | - | - | - | 1 | - | - | - |
| EL353 | Digital Control System | | | | | | | | | | | | | | | | |
| EL354 | Optical Fiber Communication | | | | | | | | | | | | | | | | |

Outcome Based Education (OBE)

| Subject Code | Subject Name | Course Outcomes | P01 | P02 | P03 | P04 | P05 | P06 | P07 | P08 | P09 | P010 | P011 | P012 | PS01 | PS02 | PS03 | |
|--------------|--------------------------|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|---|
| | | Analyse the different kind of losses, signal distortion in optical wave guides. | 3 | 2 | 2 | 2 | 1 | 1 | - | - | - | - | - | 1 | - | - | - | |
| | | Design optical source materials, LED / Laser diodes structures and Transmission Systems. | 3 | 2 | 2 | 2 | 1 | 1 | - | - | - | - | - | 1 | - | - | - | |
| | | Analyse the fibre optical receiver operation and configuration. | 3 | 2 | 2 | 2 | 1 | 1 | - | - | - | - | - | 1 | - | - | - | |
| | | Analyse Optical Amplifier and networks components. | 3 | 2 | 2 | 2 | 1 | 1 | - | - | - | - | - | 1 | 1 | 1 | - | |
| EL371 | Electronic Communication | Understand the basic concept Communication system. | 3 | 1 | - | - | 2 | - | - | 1 | - | 1 | - | 3 | - | - | - | |
| | | Analyse Digital communication systems. | 3 | 2 | 1 | 1 | 2 | - | - | - | 1 | - | 1 | - | 3 | 1 | - | 1 |
| | | Use network fundamentals for LAN. | 3 | 2 | 1 | 1 | 2 | - | - | - | 1 | - | 1 | - | 3 | - | - | 1 |
| | | Understand the Internet technologies it's security aspects. | 3 | 2 | 2 | 1 | 2 | - | - | - | 1 | - | 1 | - | 3 | - | - | 1 |
| | | Analyse Cellular Technologies. | 3 | 2 | 1 | 1 | 2 | - | - | - | 1 | - | 1 | - | 3 | 1 | - | 1 |
| | | Compare various wireless technologies. | 3 | 2 | 1 | 1 | 2 | - | - | - | 1 | - | 1 | - | 3 | 1 | - | 1 |

| Subject Code | Subject Name | Course Outcomes | SEMESTER-7 | | | | | | | | | | | | | | | | | | | | | | |
|--------------|------------------------|--|------------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|---|---|---|---|---|---|---|---|
| | | | P01 | P02 | P03 | P04 | P05 | P06 | P07 | P08 | P09 | P010 | P011 | P012 | PS01 | PS02 | PS03 | | | | | | | | |
| EL401 | Wireless Communication | Understand the basics of Wireless Communication, Evolution and comparison. | 3 | 1 | 1 | 1 | 2 | 1 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 1 | 2 | - | | | |
| | | Understand the basic concepts of basic Cellular System, design requirements and basic Principles behind radio resource management techniques such as power control, channel allocation and handoffs. | 3 | 2 | 3 | 3 | 3 | 2 | 1 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | - | |
| | | Gain insights into various mobile radio propagation models and how the diversity can be exploited to improve performance. | 3 | 3 | 3 | 3 | 3 | 2 | 1 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | - |
| | | Gain knowledge and awareness of the technologies for how to effectively share spectrum Through multiple access techniques i.e. TDMA, CDMA, FDMA etc. | 3 | 3 | 2 | 1 | 2 | 1 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 3 | - |
| | | Have in-depth understanding of the design consideration and architecture for different Wireless Systems like GSM, CDMA, and GPRS etc. | 3 | 2 | 2 | 2 | 2 | 1 | 1 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | - | |

Outcome Based Education (OBE)

| Subject Code | Subject Name | Course Outcomes | P01 | P02 | P03 | P04 | P05 | P06 | P07 | P08 | P09 | P010 | P011 | P012 | PS01 | PS02 | PS03 |
|--------------|-------------------------------|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| | | Understanding of the emerging trends in Wireless communication like WiFi, WiMAX, Software Defined Radio (SDR) and related issues and challenges. | 3 | 3 | 2 | 2 | 2 | 1 | 1 | 3 | 3 | 3 | - | 3 | 3 | 3 | 1 |
| | | Knowledge of theory and practice related to Embedded System. | 3 | 1 | 2 | - | 3 | 1 | 2 | 3 | 1 | 1 | - | 3 | 1 | 2 | 2 |
| | | Understand and analyse the Hardware techniques and Design of Software codes for Embedded Systems. | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 3 | 2 | 1 | 1 | 3 | 3 | 3 | 2 |
| | | Use software tools to simulate and analyse the performance of Embedded Systems and development of model for real time Application. | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 3 | 2 | 1 | 2 | 3 | 3 | 3 | 2 |
| | | Ability to identify, formulate and solve engineering problems by using Embedded Systems. | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 2 | 2 |
| | | Ability to implement real field problem by gained knowledge of Embedded Systems | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 3 | 3 |
| EL402 | Embedded System Design | | | | | | | | | | | | | | | | |

| Subject Code | Subject Name | Course Outcomes | P01 | P02 | P03 | P04 | P05 | P06 | P07 | P08 | P09 | P010 | P011 | P012 | PS01 | PS02 | PS03 | |
|--------------|--------------|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|---|
| EL431 | Seminar | Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the Electronics engineering practice. | 2 | 1 | 1 | 2 | 2 | 3 | 2 | 3 | 2 | 2 | 1 | 2 | 1 | 3 | 1 | |
| | | Understand the impact of the Electronics engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development. | 2 | 3 | 2 | 2 | 1 | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 2 | 2 |
| | | Apply ethical principles and commit to professional ethics and responsibilities and norms of the Electronics engineering practice | 1 | 2 | 2 | - | - | 2 | 2 | 2 | 3 | 2 | 1 | 1 | 3 | 1 | 1 | 2 |
| | | Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings | - | 2 | 3 | 2 | - | 2 | 2 | 1 | 3 | 3 | 2 | 2 | 1 | 1 | 1 | |

Outcome Based Education (OBE)

| Subject Code | Subject Name | Course Outcomes | P01 | P02 | P03 | P04 | P05 | P06 | P07 | P08 | P09 | P010 | P011 | P012 | PS01 | PS02 | PS03 |
|--------------|-----------------------------------|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| | | Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions. | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 3 | 3 | 1 | 2 | 1 | 1 | 1 |
| | | Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. | 2 | 2 | 2 | 2 | 1 | 3 | 3 | 2 | 2 | 1 | 1 | 3 | 1 | 1 | 1 |
| EL451 | Process Instrumentation & Control | Identify, formulate and analyse complex process control system problems related to industrial automation. | 3 | 2 | 2 | 2 | 2 | 3 | 2 | 1 | 2 | 2 | 2 | 1 | 3 | 3 | 3 |
| | | Understand the analytical frame work, description of actuators, final control elements and continuous and discrete control system. | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 2 | 2 | 1 | 2 | 2 | 2 |

| Subject Code | Subject Name | Course Outcomes | P01 | P02 | P03 | P04 | P05 | P06 | P07 | P08 | P09 | P010 | P011 | P012 | PS01 | PS02 | PS03 | |
|--------------|-------------------------|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|---|
| | | Design solutions for simple process problems and design small data acquisition system. | 2 | 2 | 3 | 2 | 2 | 2 | 1 | 2 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | |
| | | Identify the need for the automation problems, and have the preparation and ability to engage independent and life-long learning in the broadest context of technological change. | 2 | 2 | 1 | 2 | 2 | 3 | 1 | 2 | 2 | 1 | 1 | 1 | 3 | 2 | 3 | |
| EL452 | Radar & Navigation Aids | Knowledge in the topics such as Fundamentals of Radar | 2 | - | - | - | 1 | 2 | 1 | 1 | - | 1 | - | 1 | - | - | - | |
| | | To become familiar with fundamentals of Different types of RADAR | 2 | - | - | - | 1 | 2 | 1 | 2 | 1 | 2 | - | 2 | - | - | - | |
| | | To gain in-depth knowledge about the different types of RADAR and their operations | 2 | - | 1 | - | 2 | 2 | 2 | 1 | 2 | 2 | 2 | - | 2 | 1 | - | 1 |
| | | Understand signal detection in RADAR and various detection techniques | 2 | - | - | 1 | 2 | 2 | 2 | 1 | 2 | 1 | 1 | - | 2 | - | - | 1 |
| | | Understand Navigational Aids and Modern Navigation | 2 | 1 | - | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 1 | - | |

Outcome Based Education (OBE)

| Subject Code | Subject Name | Course Outcomes | P01 | P02 | P03 | P04 | P05 | P06 | P07 | P08 | P09 | P010 | P011 | P012 | PS01 | PS02 | PS03 | |
|--------------|---------------------------------|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|---|
| EL453 | Data communication & Networking | Apply the knowledge of communication techniques, medias and fundamentals of layer architecture to the solve computer networks' problems. | 3 | 3 | 2 | 3 | 2 | 3 | 1 | 2 | 2 | 3 | 2 | 3 | 3 | 1 | 1 | |
| | | Design solutions for different communication networks | 3 | 2 | 2 | 3 | 2 | 3 | 2 | 2 | 2 | 3 | 2 | 3 | 2 | 3 | 2 | 2 |
| | | Analyse any system as layered architecture system. | 3 | 3 | 2 | 3 | 2 | 3 | 3 | 1 | 2 | 2 | 3 | 2 | 3 | 3 | 1 | 1 |
| | | Able to choose appropriate protocol on each layer based on application demand. | 3 | 3 | 2 | 2 | 3 | 3 | 3 | 1 | 2 | 2 | 3 | 2 | 3 | 3 | 2 | 1 |
| EL454 | Digital Image Processing | Understand major issues and responsibilities of each layer. | 3 | 3 | 2 | 2 | 2 | 3 | 1 | 2 | 2 | 3 | 2 | 3 | 3 | 1 | 2 | |
| | | Understand the basic concepts of two-dimensional signal acquisition, Sampling, and quantization. | 3 | 2 | 1 | - | 2 | 1 | 1 | - | 3 | 1 | 1 | 1 | 3 | 2 | 2 | 2 |
| | | Apply the knowledge of spatial filtering techniques and enhance image quality using image enhancement techniques. | 3 | 2 | 2 | 1 | 3 | 1 | 2 | - | 3 | 2 | 2 | 1 | 3 | 2 | 2 | 2 |
| | | Understand the DFT and able to filter given image using frequency domain filtering technique. | 3 | 2 | 2 | 1 | 3 | 1 | 3 | - | 3 | 2 | 2 | 1 | 3 | 2 | 2 | 2 |

| Subject Code | Subject Name | Course Outcomes | P01 | P02 | P03 | P04 | P05 | P06 | P07 | P08 | P09 | P010 | P011 | P012 | PS01 | PS02 | PS03 |
|--------------|---|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| | | Apply the knowledge of Image restoration and reconstruction and select the right image restoration technique to remove degradation from given image | 3 | 2 | 2 | 1 | 3 | 1 | - | 3 | 2 | 2 | 1 | 3 | 2 | 2 | 2 |
| | | Understand image segmentation, image compression and image morphological operations. | 3 | 1 | 2 | 1 | 3 | 1 | - | 3 | 1 | 1 | 1 | 3 | 2 | 2 | 2 |
| | | Demonstrate teamwork and communication skills through course projects. | 3 | 1 | 2 | 3 | 3 | 3 | - | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 |
| EL471 | Micro-controller Based Electronics System | Understand the architecture of AVR 8-bit Microcontroller and importance and function of each pin of AVR ATmega32 Microcontroller. | - | - | 3 | 1 | - | - | 1 | - | - | - | - | 1 | - | - | 2 |
| | | Write, debug and simulate embedded C language programs. | 2 | - | 1 | 3 | 3 | 2 | 1 | - | - | - | - | - | 1 | 2 | 2 |
| | | Understand Timer operation, Interrupt environment and Serial Communication and. | - | - | - | - | - | 2 | 1 | - | - | - | - | 1 | - | 2 | 2 |
| | | Interface I/O peripherals like LCD, ADC, DAC devices with microcontroller | 1 | 2 | - | 1 | - | - | 2 | 1 | - | - | - | 1 | 1 | 2 | 1 |

Outcome Based Education (OBE)

| Subject Code | Subject Name | Course Outcomes | P01 | P02 | P03 | P04 | P05 | P06 | P07 | P08 | P09 | P010 | P011 | P012 | PS01 | PS02 | PS03 | |
|--------------|--------------|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|---|
| EL441 | Project | Apply the knowledge of electronics engineering to the solution of electronics engineering problems/project. | 3 | 1 | 2 | 1 | 1 | 1 | 1 | - | 1 | 1 | - | 1 | 3 | 1 | 1 | |
| | | Review research literature, and analyse complex engineering problems reaching substantiated conclusions. | - | 3 | 2 | 2 | 1 | 1 | 1 | 1 | 2 | 1 | 1 | - | 1 | 2 | 1 | 1 |
| | | Use research-based knowledge and research methods, including design of experiments, analysis and interpretation of data to design electronic project. | - | 1 | 3 | 2 | 1 | - | 1 | 1 | 2 | 1 | 1 | - | 1 | 2 | 1 | 3 |
| | | Apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to design electronics circuits using relevant software and hardware for embedded, IOT, signal processing and communication etc. based application. | - | 1 | 2 | 1 | 3 | - | 1 | - | 1 | 1 | - | 1 | 1 | 1 | 2 | |

| Subject Code | Subject Name | Course Outcomes | P01 | P02 | P03 | P04 | P05 | P06 | P07 | P08 | P09 | P010 | P011 | P012 | PS01 | PS02 | PS03 | |
|--------------|----------------|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|---|
| | | Understand the impact of the electronics engineering solutions to societal and environmental contexts, ethical principles and norms of the electronics engineering practice. | - | - | 1 | - | 1 | 3 | 2 | 3 | 1 | 1 | - | 1 | 1 | 1 | 1 | |
| | | Function effectively as an individual, and as a member or leader in diverse teams to manage projects, communicate effectively, write report and effective presentations of projects. | - | - | - | - | - | - | - | 1 | 3 | 3 | 3 | 1 | - | - | - | |
| EL455 | Antenna Design | Understanding basic antenna characteristics. | 3 | 1 | - | 2 | - | 3 | - | - | - | - | - | - | - | - | - | |
| | | Ability to select and justify an appropriate antenna for an engineering task. | 2 | 2 | 2 | 3 | 2 | 2 | 1 | 1 | - | - | - | - | 1 | - | - | |
| | | Ability to model/optimize the antenna using ANSOFT HFSS. | 2 | 2 | 2 | 3 | 2 | 2 | 1 | 1 | - | - | - | - | - | - | 2 | - |
| | | Design and fabrication of antenna with optimization of results | 2 | 2 | 2 | 3 | 2 | 2 | 2 | 2 | 1 | - | 2 | - | 2 | - | - | - |

Outcome Based Education (OBE)

| Subject Code | Subject Name | Course Outcomes | P01 | P02 | P03 | P04 | P05 | P06 | P07 | P08 | P09 | P010 | P011 | P012 | PS01 | PS02 | PS03 | |
|--------------|----------------------------|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|---|
| EL456 | Biomedical Instrumentation | To understand characterize anatomy and physiology of important physiological system of human body. | 3 | 2 | 2 | 2 | 1 | 1 | 1 | - | 1 | 1 | - | 1 | 2 | 2 | 2 | |
| | | To understand the Analyse and design of medical instruments (particularly electronics part) by evaluating medical parameter measurement constraint. | 3 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | - | 1 | 1 | - | 1 | 2 | 2 | 2 |
| | | To analyse important vital sign parameters to evaluate certain disease conditions. | 3 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | - | 1 | 1 | - | 1 | 2 | 2 | 2 |
| | | To Implementation of the electric safety of the medical instruments | 3 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | - | 1 | 1 | - | 1 | 2 | 2 | 2 |
| EL457 | Internet of Things | Knowledge of theory and practice related to IoT System. | 3 | 1 | 2 | - | 3 | 1 | 2 | 3 | 1 | 1 | - | 3 | 1 | 2 | 2 | |
| | | Understand and analyse the Hardware techniques and Design of Software codes for IoT Systems. | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 2 | 1 | 1 | 3 | 3 | 3 | 2 |
| | | Use software tools to simulate and analyse the performance of IoT Systems and development of model for real time Application. | 3 | 2 | 2 | 2 | 3 | 2 | 3 | 2 | 2 | 2 | 1 | 2 | 3 | 3 | 3 | 2 |

| Subject Code | Subject Name | Course Outcomes | P01 | P02 | P03 | P04 | P05 | P06 | P07 | P08 | P09 | P010 | P011 | P012 | PS01 | PS02 | PS03 | |
|--------------|-------------------------|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|---|
| | | Ability to identify, formulate and solve engineering problems by using IoT Systems. | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | |
| | | Ability to implement real field problem by gained knowledge of IoT Systems. | 3 | 2 | 2 | 2 | 3 | 2 | 2 | 3 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | |
| EL458 | Advance Micro-processor | Become familiar with the Intel 8086 microprocessor. | 2 | 1 | 1 | 1 | 1 | - | - | - | - | - | - | 1 | 2 | 1 | 1 | |
| | | Understand instruction set and programming of 8086. | 2 | 3 | 2 | 3 | 3 | - | - | - | - | 2 | - | 1 | 2 | 2 | 3 | 2 |
| | | Learn Intel 80386, 80486, Pentium family. | 2 | 2 | 1 | 1 | 1 | 1 | - | - | - | - | - | - | 2 | 2 | 2 | 1 |
| | | Understand Instruction Level Parallelism. | 2 | 2 | 1 | 1 | 1 | 1 | - | - | - | - | - | - | 2 | 2 | 2 | 1 |
| | | Learn Pentium and Multi-Core Architectures. | 2 | 2 | 2 | 2 | 2 | 2 | - | - | - | - | - | - | 2 | 2 | 2 | 2 |
| | | Learn recent trend in microprocessors fields and prepare PPT presentation or design mini project. | 2 | 3 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 3 | 2 |
| EL459 | Satellite Communication | Understand principle, working and operation of various sub systems of satellite as well as the earth station. | 3 | 1 | - | - | - | - | - | 2 | - | - | - | 1 | 1 | - | - | |

Outcome Based Education (OBE)

| Subject Code | Subject Name | Course Outcomes | P01 | P02 | P03 | P04 | P05 | P06 | P07 | P08 | P09 | P010 | P011 | P012 | PS01 | PS02 | PS03 |
|--------------|------------------------------------|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| | | Apply various communication techniques for satellite applications. | 3 | 2 | 2 | 2 | 2 | - | - | - | 2 | 1 | - | 1 | 1 | 1 | 1 |
| | | Analyse and design satellite communication link. | 3 | 3 | 3 | 2 | 2 | - | - | - | 2 | - | 2 | 2 | 1 | 2 | 2 |
| | | Analyse Propagation Effects and their Impact on Satellite -Earth Links. | 3 | 2 | 2 | 2 | - | - | - | - | 1 | - | | 1 | 1 | - | - |
| | | Analyse Low Earth Orbit and Non-Geostationary Satellite Systems. | 3 | 2 | 2 | 2 | - | - | - | - | 1 | - | | 1 | 1 | - | - |
| | | evaluate role of satellite in various applications. | 3 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 2 | 2 |
| | | Apply the knowledge of electronics engineering to the solution of electronics engineering problems/project. | 3 | 1 | 2 | 1 | 1 | 1 | 1 | 1 | - | 1 | - | 1 | 3 | 1 | 1 |
| | | Review research literature, and analyse complex engineering problems reaching substantiated conclusions. | - | 3 | 2 | 2 | 1 | 1 | 1 | 2 | 1 | 1 | - | 1 | 2 | 1 | 1 |
| EL446 | Industry Defined Project/ Training | Use research-based knowledge and research methods, including design of experiments, analysis and interpretation of data to design electronic project. | - | 1 | 3 | 2 | 1 | - | 1 | 2 | 1 | 1 | - | 1 | 2 | 1 | 3 |

| Subject Code | Subject Name | Course Outcomes | P01 | P02 | P03 | P04 | P05 | P06 | P07 | P08 | P09 | P010 | P011 | P012 | PS01 | PS02 | PS03 |
|--------------|--------------|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| | | Apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to design electronics circuits using relevant software and hardware for embedded, IOT, signal processing and communication etc. based application. | - | 1 | 2 | 1 | 3 | - | 1 | - | 1 | 1 | - | 1 | 1 | 1 | 2 |
| | | Understand the impact of the electronics engineering solutions to societal and environmental contexts, ethical principles and norms of the electronics engineering practice. | - | - | 1 | - | 1 | 3 | 2 | 3 | 1 | 1 | - | 1 | 1 | 1 | 1 |
| | | Function effectively as an individual, and as a member or leader in diverse teams to manage projects, communicate effectively, write report and effective presentations of projects. | - | - | - | - | - | - | - | 1 | 3 | 3 | 3 | 1 | - | - | - |

MAPPING OF POs AND PSOs WITH CO-CURRICULAR STUDENTS ACTIVITY

1. INDUCTION PROGRAM:

ACTIVITIES DURING INDUCTION PROGRAM:

1. Visit to the Institute
2. Visit to Industries: Elecon, Atlanta, Amul, Finecast and Rhino Industries etc.
3. Visit to Villages: Valsan, Jol, Mogar, Sarsa, Adas, Vaghasi, Navali, Sandeshar, Napadvanta and Vadod.
4. Expert Lectures By: Collector, Entrepreneur, Corporate leaders, Cyber Security Personnel, Spiritual & Motivational Leaders, Professional Trainer, Police Superintendent, and Artists.

OUTCOMES

1. It has provided students the confidence and skills to successfully transition to college.
2. Students have been familiarized with BVM College and its resources.
3. It has built positive relationships between new students and peers, faculty, and staff at BVM College.
4. It has assisted students in their personal development of life skills, ethical judgment and moral fortitude.
5. It has helped students for enhancing critical thinking skills through self-exploration and class experiences.
6. Student will able to develop strategies and resources for students to balance school, work, and personal commitments.
7. It has given exposure to college life in a structured and supportive learning community.

2. TECHNICAL VISITS:

1. Technical visits to core industries
2. Technical visits to Research Centres

OUTCOMES:

1. Industrial visits enhance student practical knowledge and challenges faced by the organization in the business world.
2. It gives greater clarity about various technical concepts for students as they can practically see how the classroom concepts are put into action.

3. It motivates students to achieve essential Program Outcomes like life-long learning, communication, engineer & society,
4. Students get exposure to the usage of modern tools
5. Students are motivated for learning beyond syllabus.
6. Report writing being part of every industrial visit, it enhance the writing and presentation skills.

3. INDUSTRIAL TRAINING/INTERNSHIP:

As mandatory part of the program structure, a student is required to undergo internship or industrial training in core industry or research institution for a period of total 6 weeks during his/her undergraduate program.

OUTCOMES:

1. Hands-on experience on the real time system which increases their knowledge and confidence. Competency in domain area increases
2. Enhancing report writing skill and ability to communication effectively.
3. Learn leadership qualities and to work as a member of diverse group.
4. Enhance design competency, understand project management, time management and financial issues.
5. Ability to understand industrial practices & modern tools; professional, ethical and legal issues.

4. MEMORANDUM OF UNDERSTANDING

The Institution or department has signed various MoU with Professional Training Agencies, Industrial units, Research Institutions to share the synergies for mutual benefits.

OUTCOMES:

1. Knowledge of state-of-the-art technologies through Extension Lectures.
2. Sensitizing the issues in society and industries.
3. Industrial visits, internship, undertaking projects etc. are the activities undertaken under this auspices.

5. STUDENTS ACTIVITIES

The college organizes various co-curricular and extra-curricular activities appropriately spaced during the academic calendar of the institution.

Outcome Based Education (OBE)

ACTIVITIES:

1. Student Training Program: In the domain subjects, pedagogies, communication skills, Personality Development Programs etc.
2. Social & Environmental issues: Blood donation camp, Tree Plantation, NSS & NCC activities, social activities under the aegis of NGO 'Bachpan' etc.
3. Annual Festival- 'Udaan': Comprising of about 50 events under the category of design, problem solving, coding, innovations, literature, dramatics, fine arts, music, etc.

OUTCOMES:

1. Enhance skills related to Project and financial management
2. Enhance design & innovation skills, creativity in subject domain, effective communication skills
3. Built team spirit as a member or leader of a diverse team. Build amicable personality
4. Sensitizes the social issues and the commitment of engineers toward society
5. Improve learning capacity and assimilate lifelong learning

Mapping of Activities Outcomes with POs/PSOs

| | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|----------------------------|---|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| | Engineering knowledge | 1 | - | - | - | 2 | 2 | 1 | - | 1 | - | - | - | - | - |
| | Problem analysis: | 1 | 1 | 1 | 1 | 1 | 1 | - | - | 1 | 1 | 1 | 1 | 1 | 1 |
| | Design/development of solutions: | 2 | 2 | 2 | 1 | - | - | 1 | 2 | 2 | 2 | 1 | 1 | 1 | 1 |
| | Investigations of complex problems | - | - | - | - | - | - | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | Modern tool usage: | - | - | - | 2 | - | - | 1 | - | - | 1 | 1 | 1 | 1 | 1 |
| | engineer and society: | 2 | 2 | 1 | 1 | 1 | 1 | - | - | 1 | 1 | 1 | 1 | 1 | 1 |
| | Environment and sustainability: | 2 | 2 | 1 | 1 | 1 | 1 | - | - | 1 | 1 | 1 | 1 | 1 | 1 |
| | Ethics | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | Individual and team work: | - | - | - | - | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 |
| | Communication | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | Project management and finance: | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Life-long learning: | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Analysis and evaluation of electronic circuit | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Design of problem | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Design of electronic System | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Induction Program | | | | | | | | | | | | | | | |
| Technical Visits | | | | | | | | | | | | | | | |
| Internship | | | | | | | | | | | | | | | |
| MoU | | | | | | | | | | | | | | | |
| Students Activities | | | | | | | | | | | | | | | |

