Mewar University, Gangrar

Department of Electrical Engineering

[A] Programme Outcomes (POs) for B.Tech.(EE):

Engineering Graduates will be able to:

	Program Outcome
PO1.	**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2.	**Problem analysis**: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3.	**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.
PO4.	**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.
PO5.	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
PO6.	**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.
PO7.	**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.
PO8.	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9.	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10.	**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.
PO11.	**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.
PO12.	**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.

[B] Course Outcomes (COs) for B.Tech.(EE):

Sr. No.	Course Code	Course Title	Course Outcomes
FIRST SEMESTER			
1	**BS-101**	ENGINEERING PHYSICS-I	The objective of teaching engineering physics is to give an understanding of the basic knowledge and impart quality education in physical sciences to the budding engineers. To strengthen the skills in basic measurements by exposing the students to well equipped labs and enhance the problem solving ability through interactive classes.
2	**BS-103**	ENGINEERING MATHEMATICS-I	An effective knowledge of mathematics for all engineering students is a necessary requirement for the education of qualified engineering graduates capable both of innovation and of adaptation to changing technology. After completing the syllabus, Students can better understand the mathematical terms used to solve the engineering problems under different conditions.
3	**BS-105**	ENGINEERING CHEMISTRY	It is essential that one has to understand the fundamentals of basic sciences before trying to learn their application in various branches. In framing the curriculum of chemistry, emphasis has been laid on the teaching of such topics, which have a bearing on the topics of various branches of engineering. With this object in view, some important fundamental topics of chemistry have been Included in this syllabus.
4	**ES-101**	ENGINEERING GRAPHICS & DRAWING	The objective of this course is to accurately and unambiguously capture all the geometric features of a product or a component and convey all the required information that will allow a manufacturer to produce that component.
5	**ES-103**	FUNDAMENTALS OF COMPUTERS AND PROGRAMMING	To know the components of a Computer System, To understand basic Concepts of Operating System and Computer Networks, To have an overview of different types of operating systems like DOS, UNIX/LINUX Operating System, Windows XP, To have a thorough knowledge of various System Software and Programming languages, To study different kinds of Number system, To

			know the concepts of Problem Solving, To have a thorough knowledge of C language and its programming.
6	**ES-105**	BASICS OF ELECTRICAL ENGINEERING	Students will be able to learn the fundamentals of Electrical Engineering in Circuit Analysis, Measurements & electrical machines. This will help students of all disciplines to understand the basics of Electrical Engineering.
7	**ELGA-101**	ENGLISH LANGUAGE AND GENERAL AWARENESS-I	The course is specifically focused on laying a firm foundation for English language proficiency by helping students build a strong base in Grammar and vocabulary.
SECOND SEMESTER			
8	**BS-102**	ENGINEERING PHYSICS-II	The objective of this course is to give an understanding of the basic knowledge and impart quality education in physical sciences to the budding engineers. To strengthen the skills in basic measurements by exposing the students to well-equipped labs and enhance the problem solving ability through interactive classes.
9	**BS-104**	ENGINEERING MATHEMATICS-II	The aim of the course is to solve the applications based on real industrial problems. Uncertainty is an essential feature of the engineering environment and for this reason the fields of probability and statistics are also included.
10	**ES-102**	INTRODUCTION TO ENVIRONMENTAL SCIENCES	This course will help students to develop an understanding of various environmental issues, Need for sustainable development, Solid waste disposal, Degradation of environment, Global warming, The depletion of ozone layer, Loss of biodiversity and various environmental laws.
11	**ES-104**	INTRODUCTION TO CADD	The objective of this course is to introduce the students about how computer help in industrial designing, Basics of computer graphics, knowledge about AutoCAD software.
12	**ES-106**	BASICS OF ELECTRONICS ENGINEERING	This course enables the students to understand the concept and behavior of passive electrical components in DC and AC circuits, Structure, Functionality and characteristics of electronic devices and their usage in designing Analog and digital circuits. It also describes some advanced applications and how electronic circuits can interact with outside world.

13	**ES-108**	BASICS OF MECHANICAL ENGINEERING	The main objective of the course is to understand and identify the problems related to mechanical engineering, Which may come across to the students, Irrespective of any branch of engineering during their career. In present industrial scenario engineers of every field are employed, Therefore the students of every branch must know the basic concepts of mechanical engineering.
14	**ELGA-102**	ENGLISH LANGUAGE AND GENERAL AWARENESS-II	The course aims at helping the students enhance their quality of English communication by developing an understanding of correct usage of words and phrases. It also helps them frame grammatically as well as logically correct sentences.
THIRD SEMESTER			
15	**EE-201**	ELECTRICAL MACHINE -I	To make the students understand the basic concepts of transformer operation, Their types, Parameters calculations, Energy conversion principles, DC machines fundamentals and its operation. After undergoing this course the students will have the knowledge of transformers, Energy conversion principles and DC machines operation.
16	**EE-203**	ELECTRICAL CIRCUIT THEORY	To make the students understand the basic concepts of circuits analysis, Their transient behaviour and theorems applications. After undergoing this course the students will have the knowledge of circuit analysis, Network theorems, Two port networks and coupled circuits etc.
17	**EE-205**	ELECTRICAL MEASUREMENTS & MEASURING INSTRUMENTS	To make the students understand the basic concepts of measurements and instruments, Their operating principles, And applications After undergoing this course the students will have the knowledge of various measuring instruments, Their types, Measurements of various quantities, Applications etc.
18	**EE-207**	POWER GENERATION	To make the students understand the basic concepts of electrical power generation using hydro, Nuclear, Thermal, Non-conventional energy sources and their economic operation. After undergoing this course the students will have the knowledge of various power plants, Their economic operation, Tariff structure, And power

			factor improvement etc.
19	**EE-209**	ANALOG ELECTRONICS	To make the students understand the basic concepts of electronic devices and their engineering applications. After undergoing this course the students will have the knowledge of various amplifiers, OPAM circuits, Oscillators and wave shaping circuits etc.
20	**HS-201**	ESSENTIALS OF MANAGEMENT AND ORGANIZATIONAL BEHAVIOR	To help the students lay a foundation to an understanding of Management and Organizational behavior which are essential fields of study to make a success of both their professional and personal lives.
21	**ELGA-201**	ENGLISH LANGUAGE AND GENERAL AWARENESS-III	The course is designed to help students develop effective communication skills, and hence, it lays emphasis on their spoken and listening skills.
FOURTH SEMESTER			
22	**EE-202**	ELECTRICAL MACHINES-II	To make the students understand the basic concepts of synchronous generator, Motor, Induction motor, Single phase and three phase. After undergoing this course the students will have the knowledge of operation and analysis of AC machines, And their applications.
23	**EE-204**	TRANSMISSION AND DISTRIBUTION	To make the students understand the basic concepts of transmission and distribution systems. After undergoing this course the students will have the knowledge of transmission and distribution systems parameters calculations, Transmission system efficiency, Mechanical design of lines, Insulators, Their types, Corona and cables etc.
24	**EE-206**	SIGNAL AND SYSTEMS	To make the students understand the basic concepts of signals an systems, Fourier series representation. After undergoing this course the students will have the knowledge of linear time invariant systems, Fourier, Continuous time, And discrete transforms and their applications etc.
25	**EE-208**	POWER ELECTRONICS-I	To make the students understand the basic concepts of power semiconductor devices and their classifications. After undergoing this course the students will have the knowledge of various power semiconductor devices. Types, Classifications and their operation etc.
26	**EE-210**	DIGITAL	To make the students understand the

		ELECTRONICS	basic concepts of number systems, Logic gates, Sequential circuits and memories. After undergoing this course the students will have the knowledge of Boolean algebra, Logic gates, Sequential circuits, Memory and A/D and D/A converters etc.
27	**HS-202**	FUNDAMENTALS OF BUSINESS & ECONOMICS	To provide the students a basic understanding of Business and Economics which are vital constituents of the overall professional environment of an engineer.
28	**ELGA-202**	ENGLISH LANGUAGE AND GENERAL AWARENESS-IV	The course deals with clause analysis, sentence classification based on clauses, time and tense and common errors in sentence structure. The purpose is to familiarize students with all kinds of sentences and their use.
FIFTH SEMESTER			
29	**EE-301**	ELECTROMAGNETIC FIELD THEORY	To make the students understand the basic concepts of electromagnetic fields theory and their behaviour. After undergoing this course the students will have the knowledge of electrostatics, Magnetostatics, And waves and applications etc.
30	**EE-303**	NETWORK ANALYSIS AND SYNTHESIS	To make the students understand the basic concepts of network analysis and their sysnthesis. After undergoing this course the students will have the knowledge of circuit fundamentals and their solutions, Laplace transform, Synthesis and analysis of circuits, Transfer functions etc.
31	**EE-305**	CONTROL SYSTEMS-I	To make the students understand the basic concepts of control system theory and its engineering applications. After undergoing this course the students will have the knowledge of control system components, Time domain and frequency domain analysis of systems, Root locus techniques and Nyquist criterion etc.
32	**EE-307**	POWER ELECTRONICS-II	To make the students understand the basic concepts of converters, Their types, Characteristics and power supplies. After undergoing this course the students will have the knowledge of various converters, Their types, Characteristics,Classifications, Operation and applications etc.
33	**EE-309**	POWER SYTEMS ANALYSIS	To make the students understand the basic concepts of power systems

			analysis, Methods, And stability analysis. After undergoing this course the students will have the knowledge of per unit system, Symmetrical and unsymmetrical faults, Economic load dispatch, Stability studies etc.
34	**EE-311**	MICRO-PROCESSORS-I	To make the students understand the basic concepts of microprocessors, Architecture, Peripheral devices, Interfacing and types. After undergoing this course the students will have the knowledge of various microprocessors, Types, Architecture, Programming, Interfacing etc.
35	**ELGA-301**	ENGLISH LANGUAGE AND GENERAL AWARENESS-V	The course facilitates the learning of the principles of effective formal and business communication. The course is designed to familiarize students with the developments in the fields of science, defence, space, sports and cinema. The course will also help students in develop general mental ability
SIXTH SEMESTER			
36	**EE-302**	SWITCHGEAR AND PROTECTION	To make the students understand the basic concepts of relays, Protective devices, Circuit breakers fundamentals and protective schemes. After undergoing this course the students will have the knowledge of various protective devices, Their operation, CBs, Their types, Operating principles, Protective schemes, Applications etc.
37	**EE-304**	COMPUTER METHODS IN POWER SYTEMS	To make the students understand the basic concepts of computer techniques to solve power systems problems. After undergoing this course the students will have the knowledge of faults analysis, Load flow analysis using computer techniques etc.
38	**EE-306**	ELECTRICAL MACHINE DESIGN	To make the students understand the basic concepts of electricakl machine design. After undergoing this course the students will have the knowledge of design concepts of various types of electrical machines, Their design fundamentals etc.
39	**EE-308**	CONTROL SYSTEMS-II	To make the students understand the basic concepts of state variable approach, Non-linear systems, Transforms. After undergoing this course the students will have the knowledge of state variable approach

			for solutions, Second order systems, Applications of transforms to systems, And sampled data systems etc.
40	**EE-310**	ADVANCED MICROPROCESSOR & MICROCONTROLLER	To make the students understand the basic concepts of advanced microprocessors and microcontrollers. After undergoing this course the students will have the knowledge of 8086 architecture, Instruction sets, Microcontrollers, Applications etc.
41	**EE-312**	ADVANCED INSTRUMENTATION	To make the students understand the basic concepts of fluids and fluid flow which are essential in majority of the engineering applications. After undergoing this course the students will have the knowledge of various pressure measuring instruments, Fluid statics, Types of fluid motion, Fluid dynamics, Pipe flow, The concept of boundary layer, Lift and drag etc.
42	**EE-320**	SEMINAR	The student is required to deliver an independent seminar on any of emerging areas/ application of Electronics & Communication Engineering courses. Senior faculty will supervise the students in selecting and preparation of the same. The student will submit two copies of seminar report (at least one week prior to the presentation) and shall make oral presentation as per time schedule decided by the faculty concerned. Internal Evaluation will be made on the basis of report, Presentation and the discussion during the presentation.
43	**ELGA-302**	ENGLISH LANGUAGE AND GENERAL AWARENESS-VI	The purpose of the course is to make the students confident of using English in formal as well as informal communication for business and all other purposes. The purpose of the course is to provide information on the basic concepts of entrepreneurship, IT, and business infrastructure and related legal concepts. Besides, this course also aims at familiarizing student with energy technologies and functioning of human body.
SEVENTH SEMESTER			
44	**EE-421**	DEPARTMENTAL ELECTIVE-I POWER SYSTEM OPERATION AND CONTROL	To make the students understand the basic concepts power system operation and control. After undergoing this course the students will have the

			knowledge of AGC, ELD, Coordination equations, Hydrothermal scheduling and AVR etc.
45	**EE-422**	DEPARTMENTAL ELECTIVE-II HIGH VOLTAGE ENGINEERING	To make the students understand the basic concepts of breakdown phenomenon, Concepts of high voltage engineering. After undergoing this course the students will have the knowledge of breakdown phenomenon in gases, Liquids, Solids, Generation of DC/AC/impulse waves, Measurements etc.
46	**EE-423**	DEPARTMENTAL ELECTIVE-III POWER SYSTEM RESTRUCTURING AND POWER MANAGEMENT	To make the students understand the basic concepts of power system restructuring. After undergoing this course the students will have the knowledge of competition in electricity markets, Deregulation process in the world, And in India, Transmission pricing issues, Energy management etc.
47	**EE-424**	DEPARTMENTAL ELECTIVE-IV UTILIZATION OF ELECTRICAL ENERGY	To make the students understand the basic concepts of illumination, Lighting, Heating, Electrolytioc process and utilization of energy by various methods. After undergoing this course the students will have the knowledge of illumination, Lighting, Heating, Electrolytic process, Electric traction etc.
48	**OE-431**	OPEN ELECTIVE-I ADVANCED ENGINEERING MATHEMATICS	The aim of the syllabus is to study the convergence behavior of various infinite series, To solve the applications based on double integral (surface integral) and triple integral (volume integral). The last unit 'functions of complex variables' has been added due to its usefulness in evaluating large number of new definite integrals, The theory of differential equations, The study of electric fields, Thermodynamics, And fluid mechanics.
49	**OE-432**	OPEN ELECTIVE-II ENTREPRENEURSHIP	After the completion of the course, the students will be able to have the ability to discern distinct entrepreneurial traits, Know the parameters to assess opportunities and constraints for new business ideas, Understand the systematic process to select and screen a business idea, design strategies for successful implementation of ideas, write a business plan.
EIGHTH SEMESTER			
51	**EE-441/442**	INDUSTRIAL	Each student is expected to undergo one