

CO PO MAPPING

B.TECH - PROGRAM OUTCOMES

POs describe what students are expected to know or be able to do by the time of graduation from the program. The Program Outcomes of UG in Electrical & Electronics are:

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, 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 modelling 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.
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

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comprehend and write effective reports and design documentation, make effective presentations, 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.

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

PROGRAM SPECIFIC OUTCOMES

The students will have the ability to:

1. Develop models, analyse and assess the performance of different types of generation, transmission, distribution and protection mechanisms in power systems.
2. Design, develop, analyse and test electrical and electronics systems; deploy control strategies for power electronics related and other applications.
3. Measure, analyse, model and control the behaviour of electrical quantities associated with constituents of energy or allied systems.

Course Name: Electromagnetic Fields

C212.1	Apply vector calculus to static electric – magnetic fields.	Apply
C212.2	Understand the basic laws of electromagnetism	Understand
C212.3	Obtain the electric fields for simple configurations under static conditions	Evaluate
C212.4	Obtain the magnetic fields for simple configurations under static conditions	Evaluate
C212.5	Analyze time varying electric and magnetic fields.	Analyze
C212.6	Understand Maxwell's equation in different forms and different media	Understand

Course Name: Power Systems-I

C222.1	Awareness of general structure of power systems	Understand
C222.2	Impart the knowledge of generation of electricity based on conventional energy sources	Understand & Apply
C222.3	Analyze the mechanical construction of different hydraulic turbines	Analyze
C222.4	Design & Analyze different types of distribution systems	Create
C222.5	Impart Knowledge to design the layout of various substations.	Understand & Apply
C222.6	Analyze the Economic Aspects of power generation & Evaluate the Tariff methods	Analyze

Course Name: Electrical Measurements & Instrumentation

C311.1	Understand different types of measuring instruments, their construction, operation and characteristics	Understand
C311.2	Measure the voltage and current through potentiometers and instrument transformers	Evaluate
C311.3	Identify suitable method for measurement of active, reactive power and energy	Analyze
C311.4	Apply the suitable method for the measurement of resistance, inductance and capacitance	Apply

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C311.5	Apply the knowledge of different transducers for conversion of various energy to electrical energy	Apply
C311.6	Identify the instruments suitable for typical measurements	Analyze

Course Name: Power Electronics

C322.1	Relate the semiconductor physics to properties of power devices, and combine circuit mathematics and characteristics of linear and non-linear devices	Analyze
C322.2	Describe basic operation and compare performance of various power semi conductor devices, RC components and switching circuits	Apply
C322.3	Design & analyze power converters circuits and learn to select suitable power electronic devices by assessing the requirement of application field	Create
C322.4	Formulate & Analyze a power electronic design at the system level & assess the performance	Evaluate
C322.5	Identify critical areas in application levels and derive typical alternative solutions	Analyze
C322.6	Recognize role of power electronics play in improvement of energy usage efficiency & applications of PE in emerging areas	Analyze

Course Name: Power System Operation & Control

C414.1	An understanding of operational constraints, control objectives and their implementation, under normal and abnormal states of a power system	Understand
C414.2	Analyze Economic dispatch of thermal units and methods of solution, Unit commitment- Solution methods	Analyze
C414.3	To impart the knowledge of automatic generation control	Understand & Apply
C414.4	To impart the knowledge of automatic voltage regulation	Understand & Apply
C414.5	Interchange power and energy- Economy interchange between interconnected utilities	Analyze & Create
C414.6	Create awareness of Power system security -factors affecting power system security - contingency analysis	Create

Course Name: Seminar

C425.1	To study research papers for understanding of a new field, in the absence of a textbook, to summarize and review them.	Understand
C425.2	To identify promising new directions of various cutting edge technologies	Analyze
C425.3	To impart skills in preparing detailed report describing the project and results	Analyze
C425.4	To effectively communicate by making an oral presentation before an evaluation committee	Apply
C425.5	Ability to work in actual working environment	Apply
C425.6	Ability to utilize technical resources and demonstrate professional	Apply

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ethical Responsibilities

CO – PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C212: Electro Magnetic Fields												
C212.1	2	2	3	1	1	-	-	-	-	-	-	1
C212.2	3	2	1	1	-	-	1	-	-	-	-	2
C212.3	2	2	2	3	1	-	2	-	-	-	-	-
C212.4	2	2	2	3	1	-	2	-	-	-	-	-
C212.5	2	3	1	1	2	-	1	-	-	-	-	2
C212.6	3	2	1	2	3	-	2	-	-	-	-	1
C222: Power systems-I												
C222.1	3	2	3	2	-	-	-	-	-	-	-	-
C222.2	2	2	2	3	1	-	2	-	-	-	-	-
C222.3	2	1	3	2	-	-	1	-	-	-	-	-
C222.4	2	2	2	3	1	-	1	-	-	-	-	1
C222.5	2	2	3	2	1	-	1	-	-	-	-	1
C222.6	2	2	2	2	3	2	-	-	-	-	-	1
C311: Electrical Measurements & Instrumentation												
C311.1	2	1	2	2	3	-	-	-	-	-	-	-
C311.2	2	2	2	2	3	-	-	-	-	-	-	-
C311.3	2	2	1	3	2	-	-	-	-	-	-	-
C311.4	2	-	3	2	2	-	-	-	-	-	-	-
C311.5	2	-	3	2	2	-	-	-	-	-	-	-
C311.6	2	-	2	1	3	-	-	-	-	-	-	-
C322: Power Electronics												
C322.1	3	1	2	1	-	-	-	-	-	-	-	-
C322.2	1	1	3	2	-	-	-	-	-	-	-	-
C322.3	1	2	2	3	-	-	-	-	-	-	2	1
C322.4	1	2	2	3	-	-	-	-	-	-	2	1
C322.5	1	1	2	3	-	1	1	-	-	-	1	1
C322.6	1	2	3	2	-	2	2	-	-	-	2	3
C414: Power system operation & control												
C414.1	2	3	2	1	2	-	-	-	-	-	-	-
C414.2	2	2	3	1	2	1	-	-	-	-	2	-
C414.3	2	2	3	2	2	-	-	-	-	-	2	-
C414.4	2	2	3	2	2	-	-	-	-	-	2	-
C414.5	3	-	1	-	2	1	-	-	-	-	-	1
C414.6	3	1	-	1	2	2	2	-	-	-	1	2
C425: Seminar												
C425.1	2	2	2	3	1	-	-	-	-	-	1	1
C425.2	2	2	2	2	3	-	-	-	-	-	-	2
C425.3	2	-	-	-	-	-	-	-	-	-	-	2

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C425.4	3	2	2	1	2	-	-	1	-	3	1	2
C425.5	2	2	2	1	2	3	2	1	1	1	1	1
C425.6	2	2	2	1	2	2	2	3	2	2	2	2

Note:

Enter correlation levels 1, 2 or 3 as defined below:

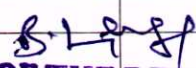
1: Slight (Low)

2: Moderate (Medium)

3: Substantial (High)

CO – PSO Mapping

CO	PSO1	PSO2	PSO3
C212: Electro Magnetic Fields			
C212.1	3	2	1
C212.2	3	-	2
C212.3	2	1	3
C212.4	2	1	3
C212.5	3	-	-
C212.6	1	2	-
C222: Power systems-I			
C222.1	2	-	-
C222.2	3	2	1
C222.3	3	-	1
C222.4	3	2	-
C222.5	3	2	-
C222.6	3	-	1
C311: Electrical Measurements & Instrumentation			
C311.1	-	2	3
C311.2	1	2	3
C311.3	1	2	2
C311.4	1	-	3
C311.5	1	1	3
C311.6	-	1	3
C322: Power Electronics			
C322.1	1	3	2
C322.2	1	3	2
C322.3	1	3	2
C322.4	-	3	2
C322.5	1	3	2
C322.6	2	3	2
C414: Power system operation & control			
C414.1	2	-	3
C414.2	1	2	-
C414.3	1	-	3
C414.4	1	-	3


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C414.5	1	1	-
C414.6	2	1	-
C425: Seminar			
C425.1	2	2	2
C425.2	1	1	1
C425.3	2	2	1
C425.4	1	1	1
C425.5	1	1	1
C425.6	2	2	2


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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

EC304PC: SIGNALS AND SYSTEMS

Course Outcomes:

After completing this course, the student should demonstrate the knowledge and ability to

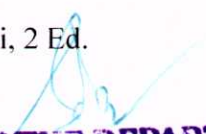
COURSE OUTCOMES	DESCRIPTION	BLOOMS TAXONOMY
C214.1	Understand the principles of vector spaces, including how to relate the Concepts of basis, dimension, inner product, and norm to signals. Know how to analyze, design, approximate, and manipulate signals using vector-space concepts	L2-UNDERSTAND
C214.2	Understand and classify signals (e.g. periodic, even) and systems (e.g. causal, linear) and an understanding of the difference between discrete and continuous time signals and systems, understand the principle of impulse functions, step function and signum function.	L2-UNDERSTAND
C214.3	Analyze the implications of linearity, time-invariance, causality, memory and bounded-input, bounded out (BIBO) stability	L4-ANALYZE
C214.4	Determine the response of linear systems to any input signal by convolution in the time domain, and by transformation to the frequency domain, filter characteristics of a system and its bandwidth, the concepts of auto Correlation and cross correlation and power density spectrum.	L3-DESIGN
C214.5	Understand the definitions and basic properties (e.g. time-shift, modulation Parseval's Theorem) of Fourier series, Fourier transforms, Laplace transforms, Z transforms, and an ability to compute the transforms and inverse transforms of basic examples using methods such as partial fraction expansions, ROC of Z Transform/ Laplace Transform.	L2-UNDERSTAND
C214.6	Analyze the Sampling theorem, reconstruction, aliasing, and Nyquist's theorem to represent continuous time signals in discrete time so that they be processed by digital computers	L4-ANALYZE

TEXT BOOKS:

1. Signals, Systems & Communications - B.P. Lathi, 2013, BSP.
2. Signals and Systems - A.V. Oppenheim, A.S. Willsky and S.H. Nawabi, 2 Ed.

REFERENCE BOOKS:

1. Signals and Systems – Simon Haykin and Van Veen, Wiley
2. Signals and Systems – A. Rama Krishna Rao, 2008, TMH


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3. Fundamentals of Signals and Systems - Michel J. Robert, 2008, MGH International Edition.

CO PO & PSO MAPPING

EC304PC: SIGNALS AND SYSTEMS

Course Outcomes	PROGRAM OUTCOMES												Program Specific Outcomes		
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C214.1	3	2	1	1	1	-	-	-	-	-	1	2	3	1	2
C214.2	3	2	2	1	1	-	-	-	-	-	1	2	3	1	-
C214.3	2	2	1	2	1	-	-	-	-	-	2	2	3	1	1
C214.4	3	1	1	2	2	-	-	-	-	-	1	1	3	1	2
C214.5	3	1	2	1	1	-	-	-	-	-	1	1	1	3	-
C214.6	3	2	1	1	2	-	-	-	-	-	1	2	2	1	-

*3: Highly matched
 2: Moderately matched
 1: Less matched


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