

1.1.3 & 1.2.1

Supporting Documents - Electrical
Engineering

**Mapping of Courses to Employability/ Skill
Development**



Name of Department: Electrical Engineering

Program: B.Tech Electrical Engineering

Paper: BTPH102-18 Optics and Modern Physics

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill	Focus	Assessment Tools to Measure Attainment of CO
CO1: Identify and illustrate physical concepts and to	✓	✓	✓	✓			✓					Apply	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2: Understand optical phenomenon, such as, interference, diffraction etc. in terms of wave model.	✓		✓	✓								Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3: Understand the importance of wave equation	✓						✓					Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO4: Appreciate the need for quantum mechanics, wave particle duality, uncertainty principle etc. and their applications.	✓		✓	✓								Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO5: Understand some of the basic concepts in	✓		✓	✓			✓					Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: BTPH112-18 Optics and Modern Physics Lab

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill	Focus	Assessment Tools to Measure Attainment of CO
CO1: Verify some of the theoretical concepts lab	✓		✓		✓	✓	✓	✓				Apply	Yes	Experiments, Viva-Voce, End Semester Exams
CO2: Trained in carrying out precise measurements	✓		✓			✓	✓					Train	Yes	Experiments, Viva-Voce, End Semester Exams
CO3: Introduced to the methods used for estimation	✓		✓		✓		✓	✓				Understand	Yes	Experiments, Viva-Voce, End Semester Exams
CO4: Learn to draw conclusions from data and	✓		✓		✓	✓	✓	✓				Knowledge	Yes	Experiments, Viva-Voce, End Semester Exams
CO5: Write a technical report which communicates	✓		✓					✓				Knowledge	Yes	Experiments, Viva-Voce, End Semester Exams

Paper: BTAM101-18 Mathematics-I (Calculus & Linear Algebra)

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill	Focus	Assessment Tools to Measure Attainment of CO
CO1: The differential and integral calculus for applications	✓		✓		✓							Analyze	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2: The fallouts of Rolle's Theorem that is fundamental	✓		✓	✓	✓							Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3: The tool of matrices and convergence of sequences	✓		✓				✓					Apply	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO4: The tools of differentiation and integration of	✓		✓				✓					Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: BTEE-101-18 Basic Electrical Engineering

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill	Focus	Assessment Tools to Measure Attainment of CO
CO1: Have the knowledge of DC circuits, AC Circuits	✓	✓										Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2: Be able to analyze of DC circuits, AC Circuits			✓	✓	✓	✓	✓	✓	✓	✓		Analyze	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3: Understand the basic magnetic circuits and applications			✓	✓								Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO4: Be introduced to types of wiring, batteries, and		✓										Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: BTEE-102-18 Basic Electrical Engineering Laboratory

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill	Focus	Assessment Tools to Measure Attainment of CO
CO1: The ability to use common electrical measuring instruments and understand the fundamentals of electrical engineering.			✓	✓	✓	✓	✓	✓	✓	✓		Analyze	Yes	Experiments, Viva-Voce, End Semester Exams
CO2: The ability to make electrical connections, and			✓	✓	✓	✓	✓	✓	✓	✓		Analyze	Yes	Experiments, Viva-Voce, End Semester Exams
CO3: Have the knowledge of electrical machines, components			✓	✓	✓	✓	✓	✓	✓	✓		Knowledge	Yes	Experiments, Viva-Voce, End Semester Exams
CO4: Understand the operation of transformers and	✓	✓										Understand	Yes	Experiments, Viva-Voce, End Semester Exams

Paper: BTME101-18 Engineering Graphics & Design (Theory & Lab.)

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill	Focus	Assessment Tools to Measure Attainment of CO
CO1: To prepare you to design a system, components	✓		✓	✓	✓	✓	✓	✓	✓	✓		Analyze	Yes	Experiments, Viva-Voce, End Semester Exams
CO2: To prepare you to communicate effectively			✓	✓	✓	✓	✓	✓	✓	✓		Knowledge	Yes	Experiments, Viva-Voce, End Semester Exams
CO3: To prepare you to use the techniques, skills, and	✓		✓	✓	✓	✓	✓	✓	✓	✓		Analyze	Yes	Experiments, Viva-Voce, End Semester Exams

Paper: BTCH101-18 Chemistry-I (Theory)

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill	Focus	Assessment Tools to Measure Attainment of CO
CO1: Analyse microscopic chemistry in terms of atomic structure			✓	✓	✓	✓	✓	✓			✓	Analyze	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2: Rationalise bulk properties and processes using			✓	✓								Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3: Distinguish the ranges of the electromagnetic spectrum	✓	✓										Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO4: Rationalise periodic properties such as ionization energy			✓	✓								Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO5: List major chemical reactions that are ionization	✓	✓										Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: BTCH102-18 Chemistry-I (Lab.)

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill	Focus	Assessment Tools to Measure Attainment of CO
CO1: Estimate rate constants of reactions from conductance			✓	✓	✓	✓	✓	✓	✓	✓	✓	Apply	Yes	Experiments, Viva-Voce, End Semester Exams
CO2: Measure molecular/system properties such as			✓	✓	✓	✓	✓	✓	✓	✓	✓	Analyze	Yes	Experiments, Viva-Voce, End Semester Exams
CO3: Synthesize a small drug molecule and analyze			✓	✓	✓	✓	✓	✓	✓	✓	✓	Ability	Yes	Experiments, Viva-Voce, End Semester Exams

Paper: BTPS101-18 Programming for Problem Solving (Theory)

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill	Focus	Assessment Tools to Measure Attainment of CO
CO1: To formulate simple algorithms for arithmetic operations	✓										✓	Apply	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2: To translate the algorithms to programs in C/C++	✓										✓	Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3: To test and execute the programs and correct errors			✓	✓	✓	✓					✓	Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO4: To implement conditional branching, iteration and loops	✓										✓	Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO5: To decompose a problem into functions and sub-problems	✓										✓	Analyze	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO6: To use arrays, pointers and structures to form data structures			✓	✓							✓	Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO7: To apply programming to solve matrix addition, subtraction, multiplication	✓										✓	Apply	Yes	Mid-Term Tests, Tutorials, End Semester Exams

_____ v _____

Yes

Mid-Term Tests, Tutorials, End Semester Exams

Paper: BTPS102-18 Programming for Problem Solving (Lab)

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill	Focus	Assessment Tools to Measure Attainment of CO
CO1: To formulate the algorithms for simple problem	✓	✓										Apply	Yes	Programming, Viva-Voce, End Semester Exams
CO2: To translate given algorithms to a working program	✓	✓	✓									Apply	Yes	Programming, Viva-Voce, End Semester Exams
CO3: To be able to correct syntax errors as reported by the compiler	✓	✓										Knowledge	Yes	Programming, Viva-Voce, End Semester Exams
CO4: To be able to identify and correct logical errors in the program	✓	✓										Knowledge	Yes	Programming, Viva-Voce, End Semester Exams
CO5: To be able to write iterative as well as recursive programs	✓	✓										Knowledge	Yes	Programming, Viva-Voce, End Semester Exams
CO6: To be able to represent data in arrays, strings and structures	✓	✓										Knowledge	Yes	Programming, Viva-Voce, End Semester Exams
CO7: To be able to declare pointers of different types and use them	✓	✓										Knowledge	Yes	Programming, Viva-Voce, End Semester Exams
CO8: To be able to create, read and write to and from files	✓	✓										Knowledge	Yes	Programming, Viva-Voce, End Semester Exams

Paper: BTMP101-18 Workshop/Manufacturing Practices (Theory & Lab.)

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill	Focus	Assessment Tools to Measure Attainment of CO
CO1: Upon completion of this laboratory course, students will be able to:			✓	✓	✓	✓	✓	✓	✓	✓		Ability	Yes	Lab Practice, Viva-Voce, End Semester Exams
CO2: They will also get practical knowledge of the different components of a system.	✓	✓										Knowledge	Yes	Lab Practice, Viva-Voce, End Semester Exams
CO3: By assembling different components, they will be able to:	✓	✓										Learn	Yes	Lab Practice, Viva-Voce, End Semester Exams

Paper: BTHU-101-18 English

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	PQ12	Skill	Focus	Assessment Tools to Measure Attainment of CO
CO1: The objective of the course is to help the student understand the basic concepts of English.	V	V									V	Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2: Students will acquire basic proficiency in reading skills.											V	Ability	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3: Students will be able to understand spoken and written English.				V	V	V	V	V	V		V	Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO4: They will be able to converse fluently.											V	Learn	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO5: They will be able to produce on their own clear and coherent oral presentations.											V	Learn	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: BTHU-102-18 (English Laboratory)

Course Outcome												PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	Skill	Focus	Assessment Tools to Measure Attainment of CO					
CO1: The objective of the course is to help the student												✓	✓										✓	Knowledge	Yes	Lab Practice, Viva-Voce, End Semester Exams			
CO2: Students will acquire basic proficiency in reading																							✓	✓	✓	Ability	Yes	Lab Practice, Viva-Voce, End Semester Exams	
CO3: Students will be able to understand spoken and														✓	✓	✓	✓	✓	✓	✓			✓		✓	Understand	Yes	Lab Practice, Viva-Voce, End Semester Exams	
CO4: They will be able to converse fluently.																							✓	✓	✓	Learn	Yes	Lab Practice, Viva-Voce, End Semester Exams	
CO5: They will be able to produce on their own clear																							✓	✓	✓	Learn	Yes	Lab Practice, Viva-Voce, End Semester Exams	

Paper: BTAM202-18 Mathematics-II (Differential Equations & Numerical Methods)

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill	Focus	Assessment Tools to Measure Attainment of CO
CO1: understand the methods which can be used to			✓	✓								Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2: demonstrate knowledge of a range of applications	✓	✓										Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3: develop their attitude towards problem solving			✓	✓	✓	✓	✓	✓	✓	✓	✓	Ability	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO4: Understand how to apply numerical methods			✓	✓								Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: BTEE-301-18 Electrical Circuit Analysis

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	Skill	Focus	Assessment Tools to Measure Attainment of CO
CO1: Apply network theorems for the analysis of elc V											Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2: Obtain the transient and steady-state respons		V	V	V	V	V	V	V	V		Apply	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3: Analyze circuits in the sinusoidal steady-state		V	V	V	V	V	V	V	V		Apply	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO4: Synthesize networks and filters.										V	Learn	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: BTEE- 302-18 Analog Electronics

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill	Focus	Assessment Tools to Measure Attainment of CO
CO1: Understand the characteristics of transistors.	V		V	V								Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2: Design and analyse various rectifier and amplifier circuits.			V	V	V	V	V	V	V			Analyze	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3: Design sinusoidal and non-sinusoidal oscillator circuits.			V	V	V	V	V	V	V			Analyze	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO4: Understand the functioning of OP-AMP and design of its various applications.			V	V								Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: BTEE-303-18 Electrical Machines-I

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill	Focus	Assessment Tools to Measure Attainment of CO
CO1: Understand the concepts of magnetic circuits.	V		V	V						V		Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2: Understand the operation of DC machines.			V	V						V		Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3: Analyse the differences in operation of different types of DC machines.			V	V	V	V	V	V	V	V		Analyze	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO4: Analyse single phase and three phase transformer.			V	V	V	V	V	V	V	V		Analyze	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: BTEE-304-18 Electromagnetic Fields

Paper: BTEE-304-18 Electromagnetic Fields												Focus Assessment Tools to Measure Attainment of CO			
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill			
CO1: To understand the basic laws of electromagnetism			V	V								Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams	
CO2: To obtain the electric and magnetic fields for a V		V										Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams	
CO3: To analyse time varying electric and magnetic			V	V	V	V	V	V	V	V		Analyze	Yes	Mid-Term Tests, Tutorials, End Semester Exams	
CO4: To understand Maxwell's equation in different			V	V								Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams	
CO5: To understand the propagation of EM waves.			V	V								Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams	

Paper: BTEE-305-18 Engineering Mechanics

Page: BTEE-305-18 Engineering Mechanics												K. J. Somaiya Institute of Engineering & Information Technology												Focus												Assessment Tools to Measure Attainment of CO											
Course Outcome												PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO12 Skills																																			
CO1: Understand the concepts of co-ordinate system												V V												Understand												Yes Mid-Term Tests, Tutorials, End Semester Exams											
CO2: Analyse the three-dimensional motion.												V V V V V V V												Analyse												Yes Mid-Term Tests, Tutorials, End Semester Exams											

CO3: Understand the concepts of rigid bodies.		V	V										Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO4: Analyse the free-body diagrams of different ar		V	V	V	V	V	V	V	V				Analyze	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO5: Analyse torsional motion and bending momen		V	V	V	V	V	V	V	V				Analyze	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: BTEE-311-18 Analog Electronics Laboratory

Paper: BTEE-311-18 Analog Electronics Laboratory													Focus			Assessment Tools to Measure Attainment of CO	
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill					
CO1: Understand the use and importance of various V		V	V	V								Understand	Yes	Experiments, Viva-Voce, End Semester Exams			
CO2: Ability to make circuits on bread-board.		V	V	V	V	V	V	V	V	V	V	Analyze	Yes	Experiments, Viva-Voce, End Semester Exams			
CO3: Analyze, take measurements to understand cir		V	V	V	V	V	V	V	V	V	V	Apply	Yes	Experiments, Viva-Voce, End Semester Exams			
CO4: Troubleshoot, design and create electronic cir		V										Knowledge	Yes	Experiments, Viva-Voce, End Semester Exams			
CO5: Evaluate the performance electronic circuits a	V	V	V	V	V		V				V	Knowledge	Yes	Experiments, Viva-Voce, End Semester Exams			

Paper: BTEE-312-18 Electrical Machines – I Laboratory

Paper: BTEE-312-18 Electrical Machines – I Laboratory													Focus	Assessment Tools to Measure Attainment of CO	
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill			
CO1: Analyze three-phase transformer/system con			V	V	V	V	V	V	V		V	Analyze	Yes	Experiments, Viva-Voce, End Semester Exams	
CO2: Evaluation of equivalent circuit parameters, ef		V	V	V								Understand	Yes	Experiments, Viva-Voce, End Semester Exams	
CO3: Analyze parallel operation of transformers.			V	V	V	V	V	V	V			Analyze	Yes	Experiments, Viva-Voce, End Semester Exams	
CO4: Analyze performance characteristics of DC gen			V	V	V	V	V	V	V			Analyze	Yes	Experiments, Viva-Voce, End Semester Exams	

Paper: BTEE-401-18 Digital Electronics

Paper: BTEE-401-18 Digital Electronics													Focus	Assessment Tools to Measure Attainment of CO	
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill			
CO1: Understand working of logic families and logic V			V	V								Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams	
CO2: Design and implement Combinational and Seq V			V	V	V	V	V	V	V	V		Analyze	Yes	Mid-Term Tests, Tutorials, End Semester Exams	
CO3: Understand the process of Analog to Digital co			V	V								Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams	
CO4: Be able to understand memories.			V	V								Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams	

Paper: BTEE-402-18 Electrical Machines – II

Paper: BTEE-402-18 Electrical Machines – II													Focus	Assessment Tools to Measure Attainment of CO	
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill			
CO1: Understand the concepts of rotating magnetic field			V	V								Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams	
CO2: Understand the operation of AC machines.			V	V								Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams	
CO3: Analyse performance characteristics of AC machines	V		V	V	V	V	V	V		V		Analyze	Yes	Mid-Term Tests, Tutorials, End Semester Exams	
CO4: To understand the difference between the synchronous and asynchronous motors			V	V								Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams	

Paper: BTEE-403-18 Power Electronics

Paper: BTEE-403-18 Power Electronics													Focus		Assessment Tools to Measure Attainment of CO	
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill				
CO1: Understand the differences between signal level			V	V									Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams	
CO2: Analyse controlled rectifier circuits.			V	V	V	V	V	V	V	V	V		Analyze	Yes	Mid-Term Tests, Tutorials, End Semester Exams	
CO3: Analyse the operation of DC-DC choppers.			V	V	V	V	V	V	V	V	V		Analyze	Yes	Mid-Term Tests, Tutorials, End Semester Exams	
CO4: Analyse the operation of voltage source invert			V	V	V	V	V	V	V	V	V		Analyze	Yes	Mid-Term Tests, Tutorials, End Semester Exams	

Paper: BTEE-404-18 Signals and Systems

Paper: BTEE-404-18 Signals and Systems													Focus			Assessment Tools to Measure Attainment of CO	
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill					
CO1: Understand the concepts of continuous time a		V	V	V									Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams		
CO2: Analyse systems in complex frequency domain				V	V	V	V	V	V	V	V		Analyze	Yes	Mid-Term Tests, Tutorials, End Semester Exams		
CO3: Understand sampling theorem and its implicat		V	V	V									Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams		
CO4: Understand mathematical tools to be able to	V		V	V									Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams		

Paper: BTAM302-18 Mathematics-III (Probability and Statistics)

Paper: BTAM302-18 Mathematics-III (Probability and Statistics)													Focus	Assessment Tools to Measure Attainment of CO	
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill			
CO1:Have basics knowledge about measure of cent: V		V											Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2: Familiarize the student with expectations of di V		V	V	V									Analyze	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3:Familiarize probability techniques and random V		V	V	V									Analyze	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO4:Have basic idea about statistics including corre V			V	V									Apply	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO5:To fit the given data into curves by various met V											V		Apply	Yes	

Paper: BTEE-411-18 Measurements and Instrumentation Laboratory

Paper: BTEE-411-18 Measurements and Instrumentation Laboratory													Focus	Assessment Tools to Measure Attainment of CO	
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill			
CO1: Design and validate DC and AC bridges.	V	V										Apply	Yes	Experiments, Viva-Voce, End Semester Exams	
CO2: Analyze the dynamic response and the calibration of the measurement devices.			V	V	V	V	V	V	V			Analyze	Yes	Experiments, Viva-Voce, End Semester Exams	
CO3: Learn about various measurement devices, the use of the instruments.		V									V	Understand	Yes	Experiments, Viva-Voce, End Semester Exams	
CO4: Understand statistical data analysis.	V		V	V								Understand	Yes	Experiments, Viva-Voce, End Semester Exams	
CO5: Understand computerized data acquisition.	V		V	V								Understand	Yes	Experiments, Viva-Voce, End Semester Exams	

Paper: BTEE-412-18 Digital Electronics Laboratory

Paper: BTEE-412-18 Digital Electronics Laboratory													Focus			Assessment Tools to Measure Attainment of CO	
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill					
CO1: To understand of basic electronic components		V	V	V									Understand	Yes	Experiments, Viva-Voce, End Semester Exams		
CO2: Understanding verify truth tables of TTL gates		V	V	V									Understand	Yes	Experiments, Viva-Voce, End Semester Exams		
CO3: Design and fabrication and realization of all ga		V	V	V	V	V	V	V	V	V	V		Analyze	Yes	Experiments, Viva-Voce, End Semester Exams		
CO4: Design the truth tables and basic circuits		V	V	V	V	V	V	V	V	V	V		Analyze	Yes	Experiments, Viva-Voce, End Semester Exams		
CO5: Testing of basic electronics circuits		V	V	V									Knowledge	Yes	Experiments, Viva-Voce, End Semester Exams		

Head
Department of Electrical Engineering

Paper: BTEE-413-18 Electrical Machines-II Laboratory

Paper: BTEE-413-18 Electrical Machines-II Laboratory													K. Gujral Punjab Technical University Kapurthala-144006			Focus			Assessment Tools to Measure Attainment of CO								
Course Outcome													PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill			
CO1: Construct equivalent circuits induction motors														V	V	V	V	V	V	V	V	V	V		Analyze	Yes	Experiments, Viva-Voce, End Semester Exams
CO2:Comprehend the requirement of starting and s														V	V	V	V	V	V	V	V	V	V		Learn	Yes	Experiments, Viva-Voce, End Semester Exams
CO3:Construct equivalent circuits of synchronous ge														V	V	V	V	V	V	V	V	V	V		Analyze	Yes	Experiments, Viva-Voce, End Semester Exams
														V	V	V	V	V	V	V	V	V	V		Apply	Yes	Experiments, Viva-Voce, End Semester Exams

Head
Department of Electrical Engineering
I.K. Gujral Punjab Technical University
Kapurthala-144006

Paper: BTEE-414-18 Power Electronics Laboratory

Paper: BTMC-101-18 Indian Constitution

Paper: BTMC-102-18 Essence of Indian Traditional Knowledge

Paper: BTEE-501-18 Power Systems-I (Apparatus and Modelling)

Paper: BTEE-502-18 Control Systems

Paper: BTEE-503-18 Microprocessors

Paper: BTEE-504A-18 Electrical Engineering Materials

Paper: BTEE-504B-18 Switchgear and Protection

Paper: BTEE-504C-18 Electrical Machine Design

Paper: BTEE-504D-18 Renewable Energy Sources

Paper: EVS-101-18 Environmental Studies

Paper: EVS-101-18 Environmental Studies

Paper: BTEE-511-18 Power Systems – I Laboratory

Paper: BTEE-512-18 Control Systems Laboratory

Paper: BTFE-513-18 Microprocessors LaboratoryPaper: BTEF-521-18 Summer Industry InternshipPaper: BTEE-601-18 Power Systems – II (Operation & Control)Paper: BTEE-602-18 Power Generation and Economics

Paper: BTEE-611-18 Electronics Design Laboratory

Paper: BTEE-612-18 Power Systems-II Laboratory

Paper: BTEE-621-18 Project -1

Paper: BTEE-603A-18 Electromagnetic WavesPaper: BTFE-603-B-18 Power System Dynamics and ControlPaper: BTEE-603C-18 Electrical Drives

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	Skill	Focus	Assessment Tools to Measure Attainment of CO
----------------	-----	-----	-----	-----	-----	-----	-----	-----	-----	------	------	------	-------	-------	--

Paper: BTEE-603D-18 Wind and Solar Energy Systems

Paper: BTEE-604A-18 High Voltage Engineering

Paper: BTEE-604B-18 Power System Reliability

Paper: BTEE-604C-18 Line-Commutated and Active PWM RectifiersPaper: BTEE-604D-18 Energy Efficient SystemsPaper: HSMC-103-18 Education, Technology and SocietyPaper: HSMC-104-18 History of Science and Technology in India

Paper: HSMC-113-18 Values and Ethics

Paper: HSMC-118-18 Introduction to Women's and Gender Studies

Paper: HSMC-124-18 Sanskrit Bhasa

Paper: HSMC (MME-303) Law and Engineering

Paper: OEE-101-18 Control Systems

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill	Focus	Assessment Tools to Measure Attainment of CO	
CO1:Understanding the model of linear-time-invariant systems.			✓	✓									Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2:Understanding state-space representations.			✓	✓									Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3:Knowledge of the concept of stability	✓	✓											Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO4:Assessment for linear-time invariant systems.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Analyze	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO5:Knowledge of non-linear systems	✓	✓											Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: OEE-102-18 Power Electronics

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill	Focus	Assessment Tools to Measure Attainment of CO	
CO1:Knowledge of power semiconductor switches	✓	✓											Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2:Understand the working of various types of converters			✓	✓									Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3: Apply the ac-dc and dc-dc converter in field	✓												Apply	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: OEE-103-18 Electrical Energy Conservation & Auditing

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill	Focus	Assessment Tools to Measure Attainment of CO	
CO1:Knowledge of the energy conservation/saving	✓	✓											Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2:Knowledge of energy conservation opportunities	✓	✓											Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3:Understand the Demonstrate skills required for			✓	✓									Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO4:Understand the Suggest cost-effective measure			✓	✓									Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: OEE-104-18 Renewable Energy Sources

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill	Focus	Assessment Tools to Measure Attainment of CO	
CO1:Knowledge of the basic properties of different	✓	✓											Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2:Knowledge of the main elements of technical	✓	✓											Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3:Understand the advantages and disadvantages				✓	✓								Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO4:Understand the energy potential of renewable				✓	✓								Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: OEE-201-18 Electric Machines

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill	Focus	Assessment Tools to Measure Attainment of CO	
CO1:Summarize the basics of Single-Phase Machine	✓	✓											Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2:Acquire knowledge about testing and applicati	✓	✓											Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3:Understand the concepts of Steeper Motors, co			✓	✓									Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO4:Understand the basic concept of DC Machines			✓	✓									Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO5:Explain the basic concepts of universal and rep	✓	✓								✓	✓	✓	Learn	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: OEE-202-18 Industrial Electrical Systems

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill	Focus	Assessment Tools to Measure Attainment of CO	
CO1: Understand the electrical wiring systems for re			✓	✓									Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2: Understand various components of industrial e			✓	✓									Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3: Analyze and select the proper size of various el			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Analyze	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: OEE-203-18 Wind and Solar Energy Systems

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill	Focus	Assessment	Tools to Measure Attainment of CO
CO1:Understand the energy scenario and the conse			✓	✓									Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2:Understand the basic physics of wind and solar			✓	✓									Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3:Understand the power electronic interfaces for			✓	✓									Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO4:Understand the issues related to the solar tech			✓	✓									Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: OEE-204-18 Power Systems

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill	Focus	Assessment	Tools to Measure Attainment of CO
CO1: Awareness of supply system	✓	✓											Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2: Understanding of the material used and constr			✓	✓									Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3: Enable the students to do analysis of power tra			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Ability	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO4: Understand the cables used in power system			✓	✓									Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO5: Knowledge of neutral grounding.	✓	✓											Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: BTEE-721-18 Project-2

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill	Focus	Assessment Tools to Measure Attainment of CO	
CO1:Apply and verify basic scientific principals and	✓												Apply	Yes	Experiments, Viva-Voce, End Semester Exams
CO2:Application of interdisciplinary knowledge	✓	✓											Knowledge	Yes	Experiments, Viva-Voce, End Semester Exams
CO3:To identify possible product that can be made			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Ability	Yes	Experiments, Viva-Voce, End Semester Exams

Paper: BTEE-701A-18 Electrical Energy Conservation and Auditing

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill	Focus	Assessment Tools to Measure Attainment of CO
CO1: Understand the current energy scenario and improve energy efficiency			✓	✓								Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2: Understand the methods of improving energy efficiency			✓	✓								Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3: Understand the concepts of different energy efficiency			✓	✓								Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: BTEE-701B-18 Computer Aided Power System Analysis

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill	Focus	Assessment Tools to Measure Attainment of CO	
CO1:To introduce computer applications in the anal	V	V											Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2:To understand the solution methods and techn			V	V									Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3:To solve numerically the complex IEEE bus net			V	V	V	V	V	V	V	V	V	V	Ability	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: BTEE-701C-18 Power Quality and FACTS

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill	Focus	Assessment Tools to Measure Attainment of CO	
CO1:To introduce the fundamental concepts relevant to power electronics	✓	✓											Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2:To enable the students to understand the factors affecting the performance of power electronic devices			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3:To provide basic understanding of the emerging trends in power electronics			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO4:To enable students to design power electronic converters			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: BTEE-701D-18 Electrical and Hybrid Vehicles

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill	Focus	Assessment Tools to Measure Attainment of CO	
CO1: Understand the conventional vehicles models				✓	✓								Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2: Understand the different possible ways of energy storage				✓	✓								Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3: Compare the different strategies related to energy storage	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		Analyze	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: BTEE-702A-18 Computational Electromagnetics

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill	Focus	Assessment Tools to Measure Attainment of CO	
CO1:Understand the basic concepts of Electrostatics			✓	✓									Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2:Understand computational techniques for com			✓	✓									Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3:Apply the techniques to simple real-life proble V													Apply	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: BTEE-702B-18 Microcontroller and PLC

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill	Focus	Assessment Tools to Measure Attainment of CO	
CO1:To understand the working of a microprocessor			✓	✓									Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2:To learn configuring and using different peripheral devices			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Analyze	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3:To compile and debug a Program in PLC			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Ability	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: BTEE-702C-18 Control Systems Design

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill	Focus	Assessment Tools to Measure Attainment of CO	
CO1:Understand various design specifications.			✓	✓									Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2:Design controllers to satisfy the desired design	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Analyze	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3:Design controllers using the state-space approach	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Analyze	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: BTEE-702D-18 Distributed Generation

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill	Focus	Assessment Tools to Measure Attainment of CO	
CO1:To impart knowledge about distributed generation	✓	✓											Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2:Their interconnection in grid	✓	✓											Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3:To understand relevance of power electronics			✓	✓									Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: BTEE-703A-18 Industrial Electrical Systems

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill	Focus	Assessment Tools to Measure Attainment of CO	
CO1: Understand the electrical wiring systems for residential and commercial buildings		✓	✓	✓									Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2: Understand various components of industrial electrical systems			✓	✓									Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3: Analyze and select the proper size of various electrical components			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Analyze	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: BTEE-703B-18 Restructured Power Systems

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill	Focus	Assessment Tools to Measure Attainment of CO	
CO1:To impart knowledge about the restructuring of power systems	✓	✓											Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2:To introduce the fundamental concepts relevant to transmission pricing, models of deregulation	✓	✓	✓	✓									Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3:To introduce the fundamental concepts relevant to ancillary services and international experience of deregulation	✓	✓	✓	✓									Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO4:To enable the students to understand the basic concepts of restructuring			✓	✓									Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: BTEE-703C-18 Advanced Electric Drives

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill	Focus	Assessment Tools to Measure Attainment of CO	
CO1:Understand the operation of power electronic			✓	✓									Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2:Understand the vector control strategies for ac			✓	✓									Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3:Understand the implementation of the control			✓	✓									Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: BTEE-703D-18 Energy Storage System

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill	Focus	Assessment Tools to Measure Attainment of CO	
CO1: Understand the different possible ways of energy storage			✓	✓									Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2: Understand the different strategies related to energy storage			✓	✓									Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3: Link the real-life examples with various industrial applications	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Analyze	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: BTEE-721-18 One Semester Training

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill	Focus	Assessment Tools to Measure Attainment of CO
CO1:														

Paper: BTEE-801-18 Smart Grids

Course Outcome													Focus	Assessment	Tools to Measure Attainment of CO
CO1:Understand technologies for smart grid.													Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2:Appreciate the smart transmission as well distribution systems	✓	✓	✓	✓									Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3:Realize the distribution generation and smart distribution	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	Analyze	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO4: Know the regulations and market models for smart grids	✓	✓	✓	✓									Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: BTEE-802-18 Artificial Intelligence Techniques

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO12	Skill	Focus	Assessment Tools to Measure Attainment of CO
----------------	-----	-----	-----	-----	-----	-----	-----	-----	-----	------	------	-------	-------	--

Paper: BTEE-803-18 Indian Electricity Standards and Practices

Paper: BTEE-811-18 Modelling and Simulation Lab

Gegandeep

(Signature of Head of Department)

Head
Department of Electrical Engineering
I.K. Gujral Punjab Technical University
Kapurthala-141006

Name of Department: Electrical Engineering Program: M.Tech Electrical Engineering (Power System)

Paper: EEPS-101-18 POWER SYSTEM ANALYSIS-I

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus on	Assessment Tools to Measure Attainment of CO
CO1: To calculate voltage phasors at all buses, given the data	✓	✓					✓	✓	Ability	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2: Able to calculate fault currents in each phase							✓	✓	Ability	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3: Rank various contingencies according to their sever	✓						✓	✓	Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO4: Estimate the bus voltage phasors given various quantities viz. power flow, voltages, taps, CB status etc				✓			✓	✓	Analyze	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO5: Estimate closeness to voltage collapse and calculate PV curves using continuation power flow			✓				✓	✓	Analyze	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: EEPS-102-18 POWER SYSTEM DYNAMICS-I

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus on	Assessment Tools to Measure Attainment of CO
CO1: Understand the modeling of synchronous machine in de	✓								Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2: Carry out simulation studies of power system dynamics u		✓	✓						Analyze	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3: Carry out stability analysis with and without power syste		✓	✓						Identify	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO4: Understand the load modeling in power system	✓								Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: EEPS-103A-18 RENEWABLE ENERGY SYSTEM

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus on	Assessment Tools to Measure Attainment of CO
CO1: Knowledge about renewable energy	✓								Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2: Understand the working of distributed generation syste	✓								Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3: 3. Know the Impact of Distributed Generation on Power System											

Paper: EEPS-103B-18 SMART GRIDS

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus on	Assessment Tools to Measure Attainment of CO
CO1: Appreciate the difference between smart grid & convent	✓								Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2: Apply smart metering concepts to industrial and commel	✓								Apply	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3: Formulate solutions in the areas of smart substations, distribut		✓	✓						Analyze	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO4: Come up with smart grid solutions using modern communicatio		✓	✓						Analyze	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: EEPS-103C-18 HIGH POWER CONVERTERS

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus on	Assessment Tools to Measure Attainment of CO
CO1: Learn the characteristics of PSDs such as SCRs, GTOs, IGB	✓								Apply	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2: Knowledge of working of multi-level VSIs, DC-DC switch	✓		✓						Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3: Acquire knowledge of power conditioners and their appl	✓	✓							Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO4: Ability to design power circuit and protection circuit of P	✓			✓					Ability	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: EEPS-103D-18 WIND AND SOLAR SYSTEMS

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus on	Assessment Tools to Measure Attainment of CO
CO1: Appreciate the importance of energy growth of the pow	✓	✓							Analyze	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2: Demonstrate the knowledge of the physics of wind pow	✓								Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3: Demonstrate the knowledge of physics of solar power ge	✓								Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO4: Identify, formulate and solve the problems of energy crises using	✓	✓							Identification	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: EEPS-104A-18 ELECTRICAL POWER DISTRIBUTION SYSTEM

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus on	Assessment Tools to Measure Attainment of CO
CO1: Knowledge of power distribution system	✓								Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2: Study of Distribution automation and its application in p	✓		✓						Analyze	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3: 3. To learn SCADA system		✓	✓						Analyze	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: EEPS-104-B-18 MATHEMATICAL METHODS FOR POWER ENGINEERING

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus on	Assessment Tools to Measure Attainment of CO
CO1: Knowledge about vector spaces, linear transformation, d	✓								Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2: 2. To learn about linear programming problems and understandin	✓	✓							Investigation	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3: 3. Acquire knowledge about nonlinear programming and	✓								Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO4: Understanding the concept of random variables, functions of ran		✓	✓						Analyze	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO5: Understand stochastic processes and their classification		✓	✓						Identification	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: EEPS-104C-18 PULSE WIDTH MODULATION FOR PE CONVERTERS

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus on	Assessment Tools to Measure Attainment of CO
CO1: Appreciate importance of PWM techniques	✓								Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2: Implement PWM using different strategies		✓	✓						Ability	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3: Control CSI and VSI using PWM		✓	✓						Ability	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO4: Compare performance of converter for different PWM te		✓	✓						Identification	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: EEPS-104-D-18 ELECTRIC AND HYBRID VEHICLES

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus on	Assessment Tools to Measure Attainment of CO
CO1: Acquire knowledge about fundamental concepts, principl	✓	✓	✓	✓					Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2: To learn electric drive in vehicles / traction.	✓	✓	✓						Ability	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: MTRM-101-18 RESEARCH METHODOLOGY AND IPR

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus on	Assessment Tools to Measure Attainment of CO
CO1: Understand research problem formulation. Analyze research problem	✓								Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2: Follow research ethics			✓						Ability	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3: Understand that today's world is controlled by Computers	✓								Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO4: Understanding that when IPR would take such importance	✓								Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO5: Understand that IPR protection provides an incentive to inventors for further research work and investment in R & D, which leads to creation of new and better products, and in turn brings about, economic growth and social benefits.											

Paper: EEPS-105-18 POWER SYSTEM STEADY STATE ANALYSIS LAB

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus on	Assessment Tools to Measure Attainment of CO
CO1: Understand the power system operational problems.	✓				✓	✓		✓	Understand	Yes	Experiments, Viva-Voce, End Semester Exams
CO2: Apply the load flow methods, fault analysis techniques	✓	✓	✓		✓	✓	✓	✓	Apply	Yes	Experiments, Viva-Voce, End Semester Exams
CO3: Applications of power electronic devices in power system	✓	✓	✓	✓	✓	✓	✓	✓	Usage	Yes	Experiments, Viva-Voce, End Semester Exams

Paper: EEPS-106A-18 POWER SYSTEM DYNAMICS LAB

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus on	Assessment Tools to Measure Attainment of CO
CO1: Do stability analysis for small signal stability	✓	✓			✓	✓		✓	Knowledge	Yes	Experiments, Viva-Voce, End Semester Exams
CO2: Analyze the single machine system using models	✓	✓	✓		✓	✓		✓	Analyze	Yes	Experiments, Viva-Voce, End Semester Exams
CO3: Simulink models considering excitation systems	✓	✓	✓	✓	✓	✓		✓	Design	Yes	Experiments, Viva-Voce, End Semester Exams

Paper: EEPS-106B-18 RENEWABLE ENERGY LAB

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus on	Assessment Tools to Measure Attainment of CO
CO1: Various power curves considering different renewable sources	✓					✓		✓	Knowledge	Yes	Experiments, Viva-Voce, End Semester Exams
CO2: Analyze the effect of variations of parameters on solar power		✓	✓			✓		✓	Analyze	Yes	Experiments, Viva-Voce, End Semester Exams
CO3: Analyze the wind power		✓	✓			✓		✓	Analyze	Yes	Experiments, Viva-Voce, End Semester Exams

Paper: MTA-101A-18 ENGLISH FOR PAPER WRITING

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus on	Assessment Tools to Measure Attainment of CO
CO1: Improve writing and readability levels for English	✓				✓			✓	Learn	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2: How to write and what to write according to section	✓				✓			✓	Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3: Skills in title writing	✓				✓			✓	Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: MTA-101B-18 DISASTER MANAGEMENT

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus on	Assessment Tools to Measure Attainment of CO
CO1: Know, how to reduce disaster risk and humanitarian response	✓						✓		Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2: Policy and practice for disaster risk reduction	✓						✓		Challenge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3: Understand the practical relevance of conflict situations	✓		✓				✓		Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO4: Planning, programming and strength and weakness of disaster management	✓	✓	✓				✓		Challenge	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: MTA-101C-18 SANSKRIT FOR TECHNICAL EDUCATION

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus on	Assessment Tools to Measure Attainment of CO
CO1: Understanding basic Sanskrit language	✓							✓	Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2: Ancient Sanskrit literature about science & technology								✓	Challenge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3: Being a logical language will help to develop logic in students							✓	✓	Challenge	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: MTA-101D-18 VALUE EDUCATION

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus on	Assessment Tools to Measure Attainment of CO
CO1: Knowledge of self-development	✓						✓	✓	Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2: Learn the importance of Human values	✓						✓	✓	Apply	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3: Developing the overall personality	✓						✓	✓	Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: EEPS-201-18 DIGITAL PROTECTION OF POWER SYSTEM

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus on	Assessment Tools to Measure Attainment of CO
CO1: Learn the importance of Digital Relays	✓						✓		Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2: Apply Mathematical approach towards protection	✓	✓	✓				✓		Apply	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3: Learn to develop various Protection algorithms	✓			✓			✓		Ability	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: EEPS-202-18 POWER SYSTEM DYNAMICS-II

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus on	Assessment Tools to Measure Attainment of CO
CO1: Gain valuable insights into the phenomena of power system dynamics	✓								Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2: Understand the power system stability problem.	✓								Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3: Analyze the stability problems and implement modern control		✓	✓						Analyze	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO4: Simulate small signal and large signal stability problems		✓	✓	✓					Analyze	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: EEPS-203A-18 RESTRUCTURED POWER SYSTEMS

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus on	Assessment Tools to Measure Attainment of CO
CO1: Describe various types of regulations in power systems.	✓								Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2: Identify the need of regulation and deregulation.		✓	✓						Identification	Yes	Mid-Term Tests, Tutorials, End Semester Exams

CO3: Define and describe the Technical and Non-technical issues	✓								✓	✓	Challenge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO4: Identify and give examples of existing electricity markets	✓	✓	✓								Identification	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO5: Classify different market mechanisms and summarize them	✓								✓	✓	Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: EEP5-203B-18 ADVANCED DIGITAL SIGNAL PROCESSING

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus on	Assessment Tools to Measure Attainment of CO	
CO1:Knowledge about the time domain and frequency domain	✓								✓	Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2:Study the design techniques for IIR and FIR filters and their applications	✓		✓	✓					✓	Designing	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3:Acquire knowledge about the finite word length effects	✓				✓				✓	Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO4:Knowledge about the various linear signal models and their applications	✓								✓	Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO5:Design of optimum FIR and IIR filters				✓					✓	Designing	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: EEP5-203C-18 DYNAMICS OF ELECTRICAL MACHINES

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus on	Assessment Tools to Measure Attainment of CO
CO1:Formulation of electro-dynamic equations of all electric machines		✓	✓						Analyze	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2:Knowledge of transformations for the dynamic analysis of machines	✓								Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3:Knowledge of determination of stability of the machines	✓								Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO4: Study about synchronous machine									Ability	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: EEP5-203D-18 POWER APPARATUS DESIGN

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus on	Assessment Tools to Measure Attainment of CO
CO1:To give a systematic approach for modeling and analysis	✓	✓	✓	✓	✓	✓			Analyze	Yes	Experiments, Viva-Voce, End Semester Exams
CO2:2.Ability to model and design all types of rotation machines including special machines	✓	✓	✓	✓	✓	✓			Analyze	Yes	Experiments, Viva-Voce, End Semester Exams

Paper: EEP5-204A-18 ADVANCED MICRO-CONTROLLER BASED SYSTEMS

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus on	Assessment Tools to Measure Attainment of CO
CO1:A processor in assembly language and develop an advanced program	✓	✓	✓		✓	✓			Apply	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2:To learn configuring and using different peripherals in a microcontroller	✓	✓	✓	✓	✓	✓			Ability	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3:To compile and debug a Program					✓	✓	✓		Designing	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO4: To generate an executable file and use it				✓	✓	✓			Designing	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: EEP5-204B-18 SCADA SYSTEMS AND APPLICATIONS

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus on	Assessment Tools to Measure Attainment of CO
CO1:Describe the basic tasks of Supervisory Control Systems	√				√				Ability	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2:Acquire knowledge about SCADA architecture, various applications	√	√	√		√				Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3:Knowledge about single unified standard architecture IEC 61850	√				√				Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO4:To learn about SCADA system components: remote terminal unit, master station	√				√				Utilization	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO5:Learn and understand about SCADA applications in transmission and distribution	√				√				Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: EEP5-204C-18 POWER QUALITY

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus on	Assessment Tools to Measure Attainment of CO	
CO1:Acquire knowledge about the harmonics, harmonic intro	✓									Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2:To develop analytical modelling skills needed for modeli	✓	✓	✓	✓						Designing	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3:To introduce the student to active power factor correcti	✓	✓	✓	✓	✓	✓	✓			Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO4:To introduce the student to series and shunt active pow	✓	✓			✓	✓	✓			Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: EEP5-204D-18 ARTIFICIAL INTELLIGENCE TECHNIQUES

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus on	Assessment Tools to Measure Attainment of CO	
CO1:Learn the concepts of biological foundations of artificial	✓									Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO2:Learn Feedback networks and radial basis function netw	✓									Understand	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO3:Identifications of fuzzy and neural network			✓							Identification	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO4:Acquire the knowledge of GA	✓									Knowledge	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: EEP5-205A-18 POWER SYSTEM PROTECTION LAB

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus on	Assessment Tools to Measure Attainment of CO
CO1: Understand the performance of protection relays with fault simulation	✓	✓	✓		✓	✓			Understand	Yes	Experiments, Viva-Voce, End Semester Exams
CO2: Modelling of relay and understand principle of different protection schemes			✓	✓	✓	✓			Designing	Yes	Experiments, Viva-Voce, End Semester Exams

Paper: EEP5-205B-18 POWER QUALITY LAB

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus on	Assessment Tools to Measure Attainment of CO
CO1: Understand and analyze power quality	✓	✓	✓			✓			Analyze	Yes	Experiments, Viva-Voce, End Semester Exams
CO2: Performance and analysis of occurrence of harmonics		✓	✓			✓			Analysis	Yes	Experiments, Viva-Voce, End Semester Exams
CO3: Knowledge of grounding techniques	✓				✓	✓			Knowledge	Yes	Experiments, Viva-Voce, End Semester Exams

Paper: EEP5-206A-18 ARTIFICIAL INTELLIGENCE LAB

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus on	Assessment Tools to Measure Attainment of CO
CO1:Write programs using AI techniques	✓	✓	✓	✓					Designing	Yes	Experiments, Viva-Voce, End Semester Exams
CO2:Learn AI oriented power applications	✓		✓						Understand	Yes	Experiments, Viva-Voce, End Semester Exams

Paper: EEP5-206B-18 POWER ELECTRONICS APPLICATIONS TO POWER SYSTEMS LAB

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus on	Assessment Tools to Measure Attainment of CO
----------------	-----	-----	-----	-----	-----	-----	-----	-----	-------	----------	--

CO1:Understand and analyze the performance of converters	✓	✓	✓		✓	✓		Analyze	Yes	Experiments, Viva-Voce, End Semester Exams
CO2:Performance analysis of drive		✓	✓		✓	✓		Analysis	Yes	Experiments, Viva-Voce, End Semester Exams

Paper: EEPS-206C-18 SMART GRIDS LAB

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus or Assessment Tools to Measure Attainment of CO
CO1:To understand structure of smart grid and micro grid	✓				✓	✓			Understand	Yes Experiments, Viva-Voce, End Semester Exams
CO2:Power quality issues for grid connected renewable source	✓	✓	✓		✓	✓			Analyze	Yes Experiments, Viva-Voce, End Semester Exams

Paper: MTA-105-18 CONSTITUTION OF INDIA

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus or Assessment Tools to Measure Attainment of CO
CO1:Discuss the growth of the demand for civil rights in India	✓						✓	✓	Knowledge	Yes Mid-Term Tests, Tutorials, End Semester Exams
CO2:Discuss the intellectual origins of the framework of argument	✓						✓	✓	Knowledge	Yes Mid-Term Tests, Tutorials, End Semester Exams
CO3:Discuss the circumstances surrounding the foundation of the Constitution	✓						✓	✓	Knowledge	Yes Mid-Term Tests, Tutorials, End Semester Exams
CO4:Discuss the passage of the Hindu Code Bill of 1956.	✓						✓	✓	Challenge	Yes Mid-Term Tests, Tutorials, End Semester Exams

Paper: MTA-106-18 PEDAGOGY STUDIES

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus or Assessment Tools to Measure Attainment of CO
CO1:What pedagogical practices are being used by teachers in the classroom?	✓					✓			Knowledge	Yes Mid-Term Tests, Tutorials, End Semester Exams
CO2:What is the evidence on the effectiveness of these pedagogical practices?	✓					✓			Knowledge	Yes Mid-Term Tests, Tutorials, End Semester Exams
CO3:How can teacher education (curriculum and practicum) and the school curriculum and guidance materials best support effective pedagogy?	✓								Knowledge	Yes Mid-Term Tests, Tutorials, End Semester Exams

Paper: MTA-107-18 STRESS MANAGEMENT BY YOGA

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus or Assessment Tools to Measure Attainment of CO
CO1:Develop healthy mind in a healthy body thus improving efficiency	✓				✓				Knowledge	Yes Mid-Term Tests, Tutorials, End Semester Exams
CO2:Improve efficiency	✓				✓				Knowledge	Yes Mid-Term Tests, Tutorials, End Semester Exams

Paper: MTA-108-18 PERSONALITY DEVELOPMENT THROUGH LIFE ENLIGHTENMENT SKILLS

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus or Assessment Tools to Measure Attainment of CO
CO1:Study of Shrimad-Bhagwad-Geeta will help the student to develop a positive attitude towards life	✓								Knowledge	Yes Mid-Term Tests, Tutorials, End Semester Exams
CO2:The person who has studied Geeta will lead the nation and the world towards a better future	✓								Knowledge	Yes Mid-Term Tests, Tutorials, End Semester Exams
CO3:Study of Neetishatakam will help in developing versatile personality of students.	✓								Knowledge	Yes Mid-Term Tests, Tutorials, End Semester Exams

Paper: EEPS-301A-18 POWER SYSTEM TRANSIENTS

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus or Assessment Tools to Measure Attainment of CO
CO1:Knowledge of various transients that could occur in power system	✓								Knowledge	Yes Mid-Term Tests, Tutorials, End Semester Exams
CO2:Ability to design various protective devices in power system	✓	✓	✓						Analyze	Yes Mid-Term Tests, Tutorials, End Semester Exams
CO3:Coordinating the insulation of various equipments in power system						✓			Coordination	Yes Mid-Term Tests, Tutorials, End Semester Exams
CO4:Modelling the power system for transient analysis				✓					Designing	Yes Mid-Term Tests, Tutorials, End Semester Exams

Paper: EEPS-301B-18 FACTS AND CUSTOM POWER DEVICES

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus or Assessment Tools to Measure Attainment of CO
CO1:1.Acquire knowledge about the fundamental principles of FACTS	✓								Knowledge	Yes Mid-Term Tests, Tutorials, End Semester Exams
CO2:2.Learn various Static VAR Compensation Schemes like TCR, SVC, etc.	✓	✓							Ability	Yes Mid-Term Tests, Tutorials, End Semester Exams
CO3:3.To develop analytical modeling skills needed for modeling and analysis of such Static VAR Systems.	✓	✓	✓	✓					Designing	Yes Mid-Term Tests, Tutorials, End Semester Exams

Paper: EEPS-301C-18 INDUSTRIAL LOAD MODELING AND CONTROL

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus or Assessment Tools to Measure Attainment of CO
CO1:Knowledge about load control techniques in industries	✓				✓				Knowledge	Yes Mid-Term Tests, Tutorials, End Semester Exams
CO2:Learn different types of industrial processes and optimize them	✓				✓				Analyze	Yes Mid-Term Tests, Tutorials, End Semester Exams
CO3:Apply load management to reduce demand of electricity	✓	✓	✓		✓				Apply	Yes Mid-Term Tests, Tutorials, End Semester Exams
CO4:Apply different energy saving opportunities in industries	✓	✓	✓		✓				Apply	Yes Mid-Term Tests, Tutorials, End Semester Exams

Paper: EEPS-301D-18 DYNAMICS OF LINEAR SYSTEMS

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus or Assessment Tools to Measure Attainment of CO
CO1:To learn linear system modeling, analysis and design so as to meet the desired specifications	✓				✓				Understand	Yes Mid-Term Tests, Tutorials, End Semester Exams
CO2:Knowledge on carrying out detailed stability analysis of the system	✓				✓				Knowledge	Yes Mid-Term Tests, Tutorials, End Semester Exams
CO3:Design observers and controllers for linear systems	✓	✓	✓	✓	✓				Designing	Yes Mid-Term Tests, Tutorials, End Semester Exams
CO4: Acquire knowledge of discrete time linear systems modeling	✓				✓				Knowledge	Yes Mid-Term Tests, Tutorials, End Semester Exams
CO5: 5.Develop and utilize modern software tools for analysis and design of linear continuous and discrete time systems					✓	✓			Designing	Yes Mid-Term Tests, Tutorials, End Semester Exams

Paper: MTOE-301A-18 BUSINESS ANALYTICS

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus or Assessment Tools to Measure Attainment of CO
CO1:Students will demonstrate knowledge of data analytics.	✓	✓	✓						Knowledge	Yes Mid-Term Tests, Tutorials, End Semester Exams
CO2:Students will demonstrate the ability of think critically in data analytics	✓	✓	✓						Analyze	Yes Mid-Term Tests, Tutorials, End Semester Exams

CO3:Students will demonstrate the ability to use technical skills	✓	✓	✓						Identify	Yes	Mid-Term Tests, Tutorials, End Semester Exams
CO4:4.Students will demonstrate the ability to translate data into clear, actionable insights.	✓	✓	✓						Analyze	Yes	Mid-Term Tests, Tutorials, End Semester Exams

Paper: MTOE-301B-18 INDUSTRIAL SAFETY

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus or Assessment Tools to Measure Attainment of CO
CO1:To know about industrial safety and ways of prevention	✓				✓		✓		Knowledge	Yes Mid-Term Tests, Tutorials, End Semester Exams
CO2:Learn about fault identification and periodic maintenance	✓		✓		✓		✓		Identification	Yes Mid-Term Tests, Tutorials, End Semester Exams
CO3:To get knowledge about all safety measures	✓				✓		✓		Knowledge	Yes Mid-Term Tests, Tutorials, End Semester Exams

Paper: MTOE-301C-18 OPERATIONSRESEARCH

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus or Assessment Tools to Measure Attainment of CO
CO1:Students should able to apply the dynamic programming	✓				✓				Apply	Yes Mid-Term Tests, Tutorials, End Semester Exams
CO2:Students should able to apply the concept of non-linear	✓				✓				Apply	Yes Mid-Term Tests, Tutorials, End Semester Exams
CO3:Students should able to carry out sensitivity analysis	✓	✓	✓		✓				Analysis	Yes Mid-Term Tests, Tutorials, End Semester Exams
CO4: Students should able to carry out sensitivity analysis	✓	✓	✓		✓				Analysis	Yes Mid-Term Tests, Tutorials, End Semester Exams

Paper: MTOE-301D-18 COST MANAGEMENT OF ENGINEERING PROJECTS

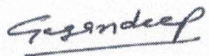
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus or Assessment Tools to Measure Attainment of CO
CO1:Understand cost management process	✓					✓	✓		Understand	Yes Mid-Term Tests, Tutorials, End Semester Exams
CO2:To execute project considering cost factor		✓	✓			✓	✓		Analyze	Yes Mid-Term Tests, Tutorials, End Semester Exams
CO3:To manage planning of cost and learn about the techniques	✓					✓	✓		Ability	Yes Mid-Term Tests, Tutorials, End Semester Exams

Paper: MTOE-301E-18 COMPOSITE MATERIALS

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus or Assessment Tools to Measure Attainment of CO
CO1:Learn about composite materials and their process of reinforcement	✓								Knowledge	Yes Mid-Term Tests, Tutorials, End Semester Exams
CO2:Understand about strength and manufacturing of matrix	✓								Understand	Yes Mid-Term Tests, Tutorials, End Semester Exams

Paper: MTOE-301F-18 WASTE TO ENERGY

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	Skill	Focus or Assessment Tools to Measure Attainment of CO
CO1:Know about the energy in biomass waste	✓						✓		Knowledge	Yes Mid-Term Tests, Tutorials, End Semester Exams
CO2:Understand the biomass fuel conversion process for energy	✓						✓		Understand	Yes Mid-Term Tests, Tutorials, End Semester Exams
CO3:Know about biomass waste properties	✓						✓		Knowledge	Yes Mid-Term Tests, Tutorials, End Semester Exams


(Signature of Head of Department)

Head
Department of Electrical Engineering
J.K. Gujral Punjab Technical University
Kapurthala-144006