Department of Electrical Engineering Articulation Matrix of CO PO PSO Academic Year 2021-22

Course Code	Name of Course	CO's	CO Statement	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
		CO 1	Apply the matrix technique (Linear algebra) to find solutions of system of linear equations arising in many engineering problem.	3											1			
		CO 2	Demonstrate the concept and use of partial differentiation in various problems.	3	2										1			
BTBS101	Engineering Mathematics I	CO 3	Compute Jacobian of functions of several variables and their applications to engineering problems	3	2										1			
		CO 4	Identify and sketch of curves in various coordinate system	3	1										1			
		CO 5	Evaluate multiple integrals and their applications to area and volume.	3	2										1			
BTBS102 Er		CO 1	Apply the concept of types of Oscillation & ultrasonic	2	1	1		1										
		CO 2	Implement the knowledge Interference, Polarization of light ,working Principle of Lasers & Fiber optics	2	1	1		1										
	Engineering Physics	CO 3	Apply the principle of motion of charged particles in EF&MF, Bainbridge Mass spectrograph, G M counter and quantum Mechanics	2	2			1										
		CO 4	Identify Types of crystals & crystal planes using Miller indices, Experimental approach for crystal determination	2	1	1		1										
		CO 5	Incorporate the concepts of types of magnetic, semiconducting and superconducting materials.	2	1	1		1										

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		CO 1	Use the drawing instruments & drawing standards effectively for drawing and dimensioning and to draw basic geometrical constructions.	1														
		CO 2	Construct orthographic views of given objects, project points on different planes.	3				3										
BTES103	Engineering Graphics	CO 3	Apply concept of projections of lines, planes	3														
		CO 4	Apply concept of projections of solids	3														
		CO 5	Construct section of solids and isometric views of given objects	3				3										
		CO 1	Apply speaking and writing skills in professional as well as social situations										3					
		CO 2	Overcome Mother Tongue Influence and demonstrate neutral accent while exercising English										3		2			
BTHM104	Communication Skills	CO 3	Apply communication skills for Presentations, Group Discussion and interpersonal interactions									2	3	1				
		CO 4	Apply grammar correctly during Speaking and Writing situations especially in context with Presentations, Public Speaking, Report writing and Business Correspondence									1	3					
		CO 1	Identify conventional ,nonconventional energy sources.	3	1				1									
PTES105	Energy and	CO 2	Know and discuss power consuming and power developing devices for effective utilization and power consumption.	2	3				1	1								
B1E3103	Engineering	CO 3	Identify various sources of air, water pollution and its effects.		1				1	2								
		CO 4	Know and discuss noise, soil, thermal pollution and Identify solid, biomedical and hazardous waste.		1				1	2								
		CO 1	Identify various Civil Engineering materials and choose suitable material among various options.	3														
		CO 2	Apply principles of surveying to solve engineering problem	1														
BTES106	Basic Civil and Mechanical Engineering	CO 3	Identify various Civil Engineering structural components and select appropriate structural system among various options	2														
	6 6	CO 4	Explain and define various properties of basic thermodynamics, materials and manufacturing processes.	2	1													
		CO 5	Know and discuss the working principle of various power consuming and power developing devices	2						1								
		CO 1	Understanding the fundamental principles of optics, Laser and fiber optics based on phenomenon like interference, polarization and diffraction	3	2	1												
BTBS107L	Engineering Physics Lab	CO 2	Demonstrating the experiments based on electricity, magnetism and material science.	3	2	1												
		CO 3	Analyse experimental data from graphical representations and to represent effectively in Laboratory reports including innovative experiments.	1	2	1												

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		CO 1	Apply the fundamental principles of engineering Graphics to create engineering drawings of various geometric constructions, engineering scales adhering to BIS standards.	1											2			
BTES108L	Engineering Graphics Lab	CO 2	Generate orthographic projections, Front view, Top view, side views of points, lines, planes and solids in both 1st angle projection method	3				3										
		CO 3	Generate the sections of solids.	3														
		CO 4	Develop isometric projection, convert orthographic views to isometric views and vice versa for practical engineering problems.	3				3										
		CO 1	Apply the fundamental principles of engineering Graphics to create engineering drawings of various geometric constructions, engineering scales adhering to BIS standards.	1											2			
BTES108L	Engineering Graphics Lab	CO 2	Generate orthographic projections, Front view, Top view, side views of points, lines, planes and solids in both 1st angle projection method	3				3										
		CO 3	Generate the sections of solids.	3														
		CO 4	Develop isometric projection, convert orthographic views to isometric views and vice versa for practical engineering problems.	3				3										
		CO 1	Develop the ability to plan and deliver the wellargued presentation GD & interviews etc.										3					
BTHM109L	Communication Skills	CO 2	Overcome language barriers & use correct grammar for effective communication										3		2			
	Lab.	CO 3	Understand appropriate corporate manners & etiquettes									2	3					
		CO 4	Identify and control behavioural aspects in organisation									2	3					
		CO 1	Discuss the need and use of complex variables to find roots, to separate complex quantities and to establish relation between circular and hyperbolic functions.	3	1										1			
		CO 2	Solve first and higher order differential equations and apply them as a mathematical modeling in electric and mechanical systems.	3	1										1			
	Engineering	CO 3	Solve linear differential equations and apply them as a mathematical modeling in electric and mechanical systems.	3	2										1			
BTBS201	MathematicsII	CO 4	Determine Fourier series representation of periodic functions over different intervals	3	2										1			
		CO5	Demonstrate the concept of vector differentiation and interpret the physical and geometrical meaning of gradient, divergence & curl in various engineering streams and also use the principles of vector integration to transform line integral to surface integral, surface to volume integral &vice versa using Green's, Stoke"s and Gauss divergence theorems.	3	2										1			
		CO 1	Differentiate hard & soft water; understand different softening method ,solve the related numerical problems	2	2													
		CO 2	Implement Phase rule in one & two component system	2														
BTBS202	Engineering	CO 3	Understand the cause of corrosion, its consequences & methods to minimize corrosion to improve industrial design	2	2													
	Chelinstry	CO 4	Explain the properties, separation techniques of crude oil along with potential application & role of petrochemical in national economy							2								
		CO 5	Demonstrate knowledge of different instruments in technical field	2														

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		CO 1	Apply fundamental Laws of Engineering Mechanics	2														
		CO 2	Apply Conditions of static equillibrium to analyze given force system	1	2													
BTES203	Engineering Mechanics	CO 3	Computee centre of gravity and moment of interia of plane surfaces		2													
		CO 4	Compute the motion characteristics of a body/particle for a rectilinear and curvilinear motion	1	2													
		CO5	Know and discuss relation between force and motion characteristics	2	1													
		CO 1	Analyse broad perspective about the uses of computers in engineering industry and C Programming	3	1	1	1											
		CO 2	Identify and develop the basic concept of algorithm, algorithmic thinking and flowchart	3	2	2	2											
BTES204	Computer Programming in C	CO 3	Create variable, keywords and different types of operators	3	2	3	3											
		CO 4	Demonstrate programs using c programming concept like loops,control statements and array	3	2	2	2											
		CO 5	Verify tasks in which the pointers are applicable and apply them to write programs and hence use computers effectively to solve the task.	3	2	2	2											
		CO 1	Build thorough knowledge of various tools, machines, devices used in engineering practice	2					2			1			1			
		CO 2	Summarize thorough knowledge of carrying out various operations in mechanical engineering workshop	2								1			2			
BTES205	Workshop Practices	CO 3	Utilize measuring skills and practical skills gained in the workshop practice	2	2							1			1			
		CO 4	Demonstrate "Hands on" training to use of various tools, devices and machines	2								2			1			
		CO 5	Acquire skills in basic engineering practice for creating objects from raw materials	1	2				2			2			2			
		CO 1	Apply basic ideas and principles of electrical engineering	3														
		CO 2	Identify protection equipment and energy storage devices.		2													
BTES206	Basic Electrical and Electronics	CO 3	Differentiate electrical and electronics domains and explain the operation of diodes and transistors	2														
	Engineering	CO 4	Acquire knowledge of digital electronics.	3														
		CO5	Design simple combinational and sequential logic circuits.			2												
		CO 1	Understand different techniques of quantitative chemical analysis to generate experimental skills	3	2		1			2		1			1			
DTDS2071	Engineering	CO 2	Apply instrumental techniques for chemical analysis	3	2		1					1			1			
B1B520/L	Chemistry Lab	CO 3	Evaluate accurate results from experiment procedure & represent effectively in laboratory reports including innovative experiments	2	3		1					1			1			
		CO 4	Analyse different properties of lubricant for selection of good lubricant	3	3		1					1			1			

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		CO 1	Understand the laws of Engineering Mechanics	2														
		CO 2	Apply the conditions of equilibrium for calculations of support reaction	2														
		CO 3	Determine the coefficient of friction			2												
BTES208L	Engineering Mechanics Lab	CO 4	Understand the simple pendulum and to find out accelaration due to gravity	2														
		CO 5	Determine the mechanical advantage, velocity ratio and efficiency of a screw jack		3													
		CO 6	Understand the location of irregular shaped bodies	2														
		CO 7	Understand and verify Lami's theorem by finding the forces in the jib crane	2														
		CO 1	Establish motivation for any topic of interest and develop a thought process for technical presentation	1	1		1			1								
		CO 2	Organize a detailed literature survey and build a document with respect to technical publications	1	3		1		1	1								
BTES210S	Seminar	CO 3	Analysis and comprehension of proofofconcept and related data		2			1										
		CO 4	Effective presentation and improving soft skills								1	1	3					
		CO 5	Make use of new and recent technology for creating technical reports					2	1						1			
		CO1	Develop an ability to find the Laplace transform of some elementary functions and with the help of some properties and inverse Laplace transform	3	3										1	2		
		CO2	Find the solution of differtial equations, Linear diiferential equations with constant coefficients having their application in mechanical, electrical, chemical and communication etc.	3	3										1	2		
BTBS301	Engineering Mathematics III	CO3	To develop the concept of Fourier transform to find solutions to some boundary value problems.	3	1										1		1	
		CO4	To develop an in depth knowledge of method of finding solutions of partial differtial equations so as to use them in solving heat equation, wave equation and Laplace equation etc.	3	2										1	2		
		CO5	To develop concept of limit, continuity, differentiation and integration of complex functions.	3	3										1	2		
		CO1	Describe three phase transformer with their construction	3	2												3	
		CO2	Analyze Electromechanical Energy Conversion Principles	3	2	3	2									2		
BTEEC302	Electrical Machines I	CO3	Illustrate working of DC generator with their construction and different types and characteristics	3	3												3	
		CO4	Examine DC motors with their different types and characteristics	3	3	2	2	2									3	
		CO5	Explain working and applications of special machines	3											2		2	
		CO6	To understand special machines	2			2										2	

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		CO1	Illustrate philosophy of measurement.	3	1												1	
		CO2	Analyze different methods of analog measurement of Electrical quantities.	3	0													2
BTEEC303	Electrical and Electronics	CO3	Analyze AC and DC bridge circuits for measurements of resistance, inductors and capacitors.	3	1											2		
	Measurement	CO4	Explain different methids of digital measurements of Electrical quantities	3													2	
		CO5	Explain principle of construction and operation of different transducers and display methods	3														2
		CO1	Understand the history of human rights.							2								
		CO2	Learn to respect other caste, religion, region and culture.						2									
		CO3	Be aware of their rights as Indian citizen.							2	3							
BTHM304	Basic Human Rights	CO4	Understand the importance of groups and communities in society.						3									-
		CO5	Realize the philosophical and cultural basis and historical perspectives of human rights.									2	2					
		CO6	Make them aware of their responsibilities towards the nation.							2								
		CO1	Descibe characteristics and concepts of Electrical conducting materials.	3	3	2							1		1	1		
		CO2	Describe characteristics and concepts of Dielectric materials.	3	2	2								1	3	1		
BTES305	Engineering Material Science	CO3	Describe characteristics and concepts of Semiconductor materials.	3											1		1	
		CO4	Explain characteristics and concepts of Magnetic materials.	2	2							1			2		1	
		CO5	Explain characteristics and concepts of Special Purpose materials.	3								1			2			1
BTEFI 306	Electrical Machines I	CO1	Understand Construction and working of Transformer	2	2		2			2				2				
DIEEL500	Lab	CO2	Understand working and construction of DC machines	2	2		2			2				2			2	
		CO1	Aquire knowledge of the characteristics of measuring instruments and their classifications.	3				2									1	
BTEEL307	Electrical and Electronics Measurement Lab	CO2	Conversant in construction, working of measuring instruments and their proficient use.	3				2									2	
	Houstrement Eub	CO3	Understand the importance and classification of sensors and transducers used in measurements.	2				2	2							1		
		CO1	Analyze applications of basic technology in the real life	2			3		2	2			1	2				
BTEEP308	Mini Project I	CO2	Handle latest technological advances in the engineering point of view regarding application	3		1				2		1		1				
		CO3	Allpy engineering knowledge to solve technical problems															
		CO1	Analyze sensors, actuators, communication and Networking.	1														2
	InternshipI	CO2	Analyze Cyber Physical Systems and Cyber security in Industry 4.0.	2	3												2	
BTES211P	Evaluation	CO3	Practice theory related to Industrial IoT Systems	3		1											2	
		CO4	Implement real case studies by gained knowledge of Industrial applications with IoT capability	2		2	2										1	

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		CO1	Understand different technologies of electric network.	3	3	2							1		1			
		CO2	Apply basic laws, theorems and the network topolgies method of solving an electrical network to DC and AC electric circuit.	3	2	2								1	3	3		
BTEEC401	Network Theory	CO3	Analyze the transient and steady state response of electrical circuits in time and frequency domain.	3											1		2	
		CO4	Evaluate the various parameters of two port network and network synthesis.	2	2							1			2	2		
		CO5	Analyze response in series and parallel circuit and design filters.	3								1			2	2		
		CO1	Explain different power plants of electrical power generation.				2			2				2		3		
		CO2	Illustrate an electrical design of overhead transmission line.	2		3										2		
BTEEC402	Power System	CO3	Illustrate the mechanical design of overhead transmission line.	2		3											2	
		CO4	Analyze performance of transmission line.	2	2		2									2		
		CO5	Explain ACDC distribution system.	3					2					1			2	
		CO1	Explain the working principle of induction machine	3	3	2							1		1	2	3	
		CO2	Discuss the working principle of Synchronous machine.	3	2	2								1	3		3	
BTEEC403	Electrical Machine II	CO3	Illustrate different methods of speed control of AC motor	3											1	1	1	
DILLETUS		CO4	Explain importance and procedure of different performance test on AC motor.	2	2							1			2	2	3	
		CO5	Draw different operating characteristics of Frictional kilowatt machines.	3								1			2		1	
		CO6	Describe different types of special purpose machine.	3								1			1	3	2	
		CO1	Analyse Bipolar Junction Transistor circuits.	3	3	2							1		1	3		
		CO2	Apply concepts of Operational amplifier design applications.	3	2	2								1	3	3		
BTBS404	Analog and Digital Electronics	CO3	Illustrate Number systems, Logic Gates and Boolean algebra.	3											1	3		
		CO4	Illustrate Digital Logic Gates characteristics and minimization techniques.	2	2							1			2			
		CO5	Examine Combinational Systems.	3								1			2			
		CO1	Analyse Bipolar Junction Transistor circuits.	3	1		1	1									2	
		CO2	Analyse JFET and MOSFET Transistor circuits.	3	2		1	2									2	
BTEEPE405D	Electronic Devices and Circuits	CO3	Apply transistor knowledge to study Power amplifiers and feedback amplifiers.	3	3		2	3	1						1	2		
		CO4	Illustrate circuits of sinusoidal and nonsinusoidal oscillators and Multivibrators.	3	1		1	1										
		CO5	Examine circuits of regulated power supply.	3	3		2	3	1						1	1		

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		CO1	Apply basic laws, theorms, methods for DC electric network	3	3		3	3					2		2	3		
BTEEL 406	Network Theory Lab	CO2	Acquire skills of MATLAB for transient response of RC,RL networks	3	3		3	3					2		3	2	1	
DILLE	Network Theory Lab	CO3	Analyse resonance in series R,L and C	3	2		3	3					2		2	2	1	
		CO4	Evaluate various parameters of 2 port network	3	2		3	1					2		2		1	
		CO1	Explain working of Electrical Power Generation plant.	2	2	3										3		
BTEEL407	Power System Lab	CO2	Describe overhead transmission line & its parameter.	2		2	2									2		
		CO3	Discuss distribution Substation layout & working			3	2										2	
		CO1	Analyze working of 3 phase Synchronous machine.	3	2	2						2			1	3		
		CO2	Ecaluate the regulation methods of alternator.	3	3	2						2		1	2	3		
	Electrical Machine II	CO3	Develop the understanding of starters for Induction motor.	3								1			1	3		
BTEEL408	Lab	CO4	Develop the understanding of test conducted for Induction motor.	2	1							2						-
		CO5	Use the computer to understand speed control method of induction motor.	3	2	2						2						
		CO6	Use the computer to understand slip test of synchronous machine.	3	2	2						2						
		CO1	Demonstrate charateristics and frequency response of Bipolar Junction Transistor.	3			2								3		1	
		CO2	Understand and demonstrate characteristics of Opamp	2			2								3			
BTEEL409	Electronics Lab	CO3	Verify functionality of Logic Gates	3	3		2										1	
		CO4	Design and implement Sequential Logic design			3		3					2		3		1	
		CO5	Design and implement Combinational Logic design			3		3					2		3		1	
		CO1	Understand sensors, actuators, communication and Networking.	3		1						3						
BTEED/10	InternshipII	CO2	Understand Cyber Physical Systems and Cyber security in Industry 4.0.	3		2					3				3			
DIEEF410	internshiph	CO3	Knowledge of theory related to Industrial IoT Systems	2			2		2									
		CO4	Ability to implement real case studies by gained knowledge of Industrial applications with IoT capability	3	2							1		1		3		
		CO1	Explain the working principle of induction machine	3	3			3							3		2	
DTEEGSAL		CO2	Analyze the working principle of Synchronous machine.	3	2	3		3							2		3	
BTEEC201	Electrical Machine II	CO3	Explain different methods of speed control of AC motor	3	2	2									3	2		
		CO4	Describe importance and procedure of different performance test on AC motor.	2	2										2		2	
		CO1	Understand the Power system operation and control methods.	3	3			3							3	2	3	
		CO2	Select proper methodologies for load flow studies for the power network	3	2	3		3							2	2	3	
BTEEC502	Power System II	CO3	Explain different methods of reactive power control.	3	2	2									3	1	3	
		CO4	Analyze different faults in power system.	2	2										2		2	
		CO5	Apply concepts of Stability Analysis.	2	3	3	2								3	1	2	
		CO6	Apply concepts of Stability Analysis.	2	2		2	2							2	1		2

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		CO1	Explain the Architecture of 8085.	3	1		1	1										
		CO2	Analyze interfacing and interrupt features of 8085.	3	2		1	2									1	
BTEEL503	Microprocessor and MicroController	CO3	Develop Assembly language programs for 8085.	3	3		2	3	1						1		1	
		CO4	Explain the Architecture of 8051.	3	1		1	1										
		CO5	Develop programs for basic applications of 8051.	3	3		2	3	1						1		2	
	Value Education, Human Rights and	CO1	Understand value of education and self development.								2	2	2					
BTHM504	Legislative	CO2	Develop good values and character.						2		1	1	1					
	[MOOC/Swayam/NP	CO3	Know human rights and legislative procedures.							1	1	1						
		CO1	Explain the principle of energy conversion technique from biomass energy systems	3	3			3							3			3
	Advances in	CO2	Explain different resource to generate energy from geothermal energy systems	3	2	3		3							2			3
BTEEE505	Renewable Energy Sources	CO3	Discuss need and types of hybrid energy systems	3	2	2									3			2
	Sources	CO4	Analyze effects of air pollution and noise pollution	2	2										2			1
		CO5	Explain definition, concept of environmental impact and structure of ecosystems	2	3	3	2								3			1
		CO1	Review basic components of power system, types of conventional and non conventional energy sources.	2	1											1		1
	Douton Diant	CO2	Explain principle of construction and operation of different nonconventional power plants.	2	1											1		1
BTEEOE506	Engineering	CO3	Explain principle of construction and operation of different conventional power plants.	2	1											1		1
		CO4	Explain economics of combined working of power plants.	2	1											1		1
En		CO5	Analyze interfacing of different power plant to grid.	3	2											1		1
		CO1	Deminstrate working of 3 phase Synchronous machine.	3	2	2		2									3	
BTEEL 507	Electrical Machine II	CO2	Illustrate the regulation methods of alternator.	3	3	2		2									3	
BIEEE507	Lab	CO3	Demonstrate the understanding of starters for Induction motor.	3	3	2		2									3	
		CO4	Illustrate testing of Induction motor.	3	3	2		2					2				3	
		CO1	Understand the Sequence reactance of Synchronous machine	3	3			3							3	2	3	
BTEEL 508	Power System II Lab	CO2	Analyze the fault in AC network.	3	2	3		3							2	2	3	
DTLLL000		CO3	Develop Load flow equations for components in AC system	3	2	2									3	2	3	
		CO4	Use the computer for Stability study.	2	2			3							2		2	
		CO1	Demonstrate architecture of Microprocessor and Microcontroller.	3			2								3			
		CO2	Demonstrate use of 8085 Microprocessor instruction set.	2			2								3			
BTEEL509	Microprocessor and MicroController Lab	CO3	Demonstrate Assembly language Program of 8085 Microprocessor.	3	3		2										2	
		CO4	Demonstrate Assembly language Program of 8081 Microcontroller.			3		3					2		3		2	
		CO5	Demonstrate interfacing of Input/ Output devices to Microprocessor and Microcontroller			3		3					2		3		2	

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		CO1	Develop practical skills, critical thinking, problem solving skills by working on projects.	2	1	2	1									1	2	
		CO2	Apply theoretical knowledge to real world problem.	3	1	1										1	2	
PTEEE510	Inductrial Training	CO3	Build communication and teamwork skills.						3	3						1	2	
DIEEF310	industriai Training	CO4	Develop a professional network and gain exposure.						3	2	2					1	2	
		CO5	Reflect on personal strengths and areas for professional develoment and career advancement.						2			3				1	2	
		CO6	Document and prepare report.							3			2			1	2	
		CO1	Categorize and analyze different types of nonlinearity present in system	3	1		1	1									2	
		CO2	Design PID based controllers	3	2		1	2									3	
BTEEC601	Control System	CO3	Apply state variable techniques to analyze systems	3	3		2	3	1						1		2	
		CO4	Apply concepts of Discrete Data Control System to analyze Control System	3	1		1	1									2	
		CO5	Organize relevant control system for Engineering application	3	3		2	3							1		2	
		CO1	Explain principles of electric machine design.	2	2		2										3	
		CO2	Explain different types of electrical apparatus	3				2						2			2	
DEFECC	Principles of	CO3	Describe types and parameters of AC and DC windings	3				2						2		2		
BTEEC602	Electrical Machine Design	CO4	Explain Heating, Cooling and Ventilation for electrical machine	2		2											2	
		CO5	Design Transformer for different ratings	3	2	3		2						2		2		
		CO6	Explain CAD and use it for transformer design	1		3		3						1			3	
		CO1	Review principle of construction, operation and characteristics of basic semiconductor devices.	3												1		
BTEEC603	Power Electronics	CO2	Understand and analyze performance of controlled and uncontrolled converters.	2			2										1	
DIELCOUS	I ower Electronics	CO3	Understand and analyze performance of DC to DC converters. DC to AC converters.	2			2										1	
		CO4	Understand and analyze performance of AC voltage controllers.	3			2										1	
		CO1	Develop components and layers of industrial automation control system.	3	1	1	1	3							3		2	
		CO2	Explain construction and working principle of different industrial measurement systems.	3	2	3	1	3							3	1		
BTEEE604	Industrial automation and Control	CO3	Identify new trends in industrial process control	3	2	3	3	1							3		2	
		CO4	Describe PLC and design a relay ladder logic in sequnece control.	3	1	1	3	2							1		2	
		CO5	Explain different technologies of hydralic control and pneuamatic control, CNC, Field bus.	3	1	1	1	2							1	2		
		CO1	Explain principles of protective relaying.	3	3			3					1			2	2	
BTEEC605	Switch Gear and	CO2	Describe principle of construction, operation and selection of different type of circuit breaker used in power system.	3	2			3						1	1	2	2	
DILLC005	Protection	CO3	Explain different protection schemes used in power system operation.	3							1					3	1	
		CO4	Discuss insulation coordination and over current protection.	2								1			2	1	1	

Course Code	Name of Course	CO's	CO Statement	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
		CO1	Analyze of data, information and knowledge.			2	2			2								
		CO2	Define the concept of marketing.		2	2							1					
BTEEOE606	Project Management	CO3	Identify project and work for community devepment.	2	2	2								2				
		CO4	Analyze the business model.	2	2	2	2								2			
		CO1	To understand and use various components of Analog Computer System.	3			2											3
		CO2	To understand concepts of MATLAB programing and simulation tools.	2			2											3
BTEEL607	Control System Lab	CO3	To analyze Control System using MATLAB programming commands.	3	3		2											
		CO4	To simulate nonlinear control systems using MATLAB simulation tool.			3		3					2					3
		CO5	To obtain solutions of state space equations using MATLAB			3		3					2					3
		CO1	Illustrate electrical symbol & electrical installation procedure.	2	2	3										2		
BTEEL 608	Principles of Electrical Machine	CO2	Design of DC shunt motor starter & Start Delta Starter.	2		2											2	
DILLEOUS	Design Lab	CO3	Design of AC DC winding	2		3	2										2	
		CO4	Design of transformer	2		3	2										3	
		CO1	Use the power electronics simulation packages to develop the power converters.	2			2	3									1	
BTEEL609	Power Electronics Lab	CO2	Analyze the different converters output waveforms for R and RL loads	2			2	3									1	
		CO3	Understand operating principle of various power electronics circuits /converter.	2			2	3								1		
		CO1	Explain the fundamental concept of power system.	3	3										3	3		
		CO2	Design the mathematical model of synchronous machine.	3	2	3									2		2	
BTEEC701	Power System Operation & Control	CO3	Design the mathematical model Excitation system and speed governing system.	2	2			3							3	2		
		CO4	Analyse the transient stability of power system using swing equation and equal area criteria.	2	2										2	3		
		CO5	Analyse the economic operation of power system.	3	2	2		3							3	2		
		CO1	Illustrate the concept of electric field stresses, applications of insulating materials	3	3										3	2	2	1
		CO2	Explain the breakdown process in solid, liquid, and gaseous materials.	3	2	3									2	1	3	2
BTEEC702	High Voltage Engineering	CO3	Analyze methods for generation and measurement of High Voltages and Currents (both ac and dc)	2	2			3							3		2	3
		CO4	Describe the phenomenon of overvoltage and choose appropriate insulation coordination levels based on IS & IEC Standards.	2	2										2	1	2	1
		CO5	Understand the methods for Nondestructive testing of equipment like transformers, insulators, isolators, bushings, lightning arrestors, cables, circuit breakers and surge diverters	3	2	2		3							3	2	3	2

Course Code	Name of Course	CO's	CO Statement	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
		CO1	Analyze the dynamics of Electrical Drives system.	3	1												3	
BTEEC703	Electrical Drives	CO2	Use various control techniques for controlling the speed of AC and DC motors.	3	3												3	
		CO3	Analyze the AC and DC drives.	2	2	1										2		
		CO1	Explain the details of construction, principle of operation and performance of synchronous reluctance motors and their different applications.	3				3									3	
		CO2	Analyze the details of construction, principle of operation and performance of stepper motors and their different applications.						1				3				3	
BTEEE704	Special Purpose Electrical Machines	CO3	Describe the details of construction, principle of operation and performance of switched reluctance motor and their different applications.							2							3	
		CO4	Explain the details of construction, principle of operation and performance of permanent magnet brushless DC motor and their different applications.		1	2								3			3	
		CO5	Explain the details of construction, principle of operation and performance of permanent magnet synchronous motor and their different applications.				3				1						3	
		CO1	Compare the HVDC and HVAC transmission options, justify the advantages of HVDC transmission system.	1												2		
		CO2	Analyze converter configuration and also HVDC converter for different mode of operation	2	3											2		
BTEEE705	HVDC Transmission	CO3	Choice of converter and their control configuration	3		1										1		
	and FAC15	CO4	Identify the different types of protections used HVDC ystem.	2		2	2									3		
		CO5	Analyze the basic FACTS concept and general system configuration.	3				2				3	3		3	2		
		CO6	Explain detail study of static shunt compensator	2						`						1		
		CO1	Understand program to compute the voltage and power factor using MATLAB.	2	2	2		3								2		
	Power System	CO2	Understand simulation of AVR single load frequency control using MATLAB.	2	2	3		3									2	
BTEEL706	Operation & Control Lab	CO3	Understand program for economic dispatch in power systems using MATLAB	2	2	2		3								2		
		CO4	Understand for synchronous machine operation using MATLAB	2	2	2		3								3		
		CO5	Understand program to solve the given Equal Area Criteria problem using MATLAB	2	2	2		3		`						2		
		CO1	Understand and assimilate the concepts of High Voltage Engineering.	3	3				2						3	2	2	1
PTEEL 707	High Voltage	CO2	Analyze the effect of high voltage on equipment	3	2				3						2	1	3	2
BIEEL/0/	Engineering Lab	CO3	Simulate the components for protection from overvoltage or lightning phenomenon.	2	2			3	2						3		2	3
		CO4	Understand the concept of breakdown strength of insulating material and dielectric material	3	2				3						2	1	2	1
		CO1	Simulate single phase half/ full controlled converter DC Drive.	1	2	2	3								1	2	2	
		CO2	Simulate Speed control of DC motor using chopper.	1	1	1	2								1	2	2	
BTEEL708	Electrical Drives Lab	CO3	Simulate of AC Drive .	2	2	2	2								1	2	2	
		CO4	Simulate V/f control of AC drive	1	2	2	3								1	2	2	
		CO5	Simulate the inverter fed induction motor drive.	1	1	1	2								1	2	2	

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BTEES709	Seminar	CO1	Verifys basic scientific principles of Electrical Engineering topics	1	2	2	3								1	1		
		CO2	Enhance presentation skills.	1	2	2	3								1			
		CO3	Develop report writing skills	1	1	1	2								1			
BTEEP710	Project PartI	CO1	Demonstrate an understanding of the fundamental principles of Electrical Engineering and apply them to the design and development of a complex electrical system	3		2	2					2		2	2	2		
		CO2	Conduct research and analyze existing litrature in the field of Electrical Engineering to identify the latest trends and technologies		3						2							
		CO3	Use advanced software tools and techniques to design , simulate and test electrical system	2		2	2	3								2	2	
		CO4	Work effectively in a in a team to plan manage and execute the project and communicate progress and outcomes						3				1		2			
		CO5	Document and report on project with outcomes							3					2			
BTEEF711	Field Training /Internship/Industrial Training III	CO1	Develop practical skills, critical thinking, problem solving skills by working on projects.	2	1	2	1									1	2	
		CO2	Apply theoretical knowledge to real world problem.	3	1	1										1	2	
		CO3	Build communiaction and teamwork skills.						3	3						1	2	
		CO4	Develop a professional network and gain exposure.						3	2	2					1	2	
		CO5	Reflect on ersonal strengths and areas for professional develoment and career advancement.						2			3				1	2	
		CO6	Document and prepare report.							3			2			1	2	
BTEEP801	Introduction to Industry 4.0 and Industrial Internet of Things	CO1	Understand sensors, actuators, communication and Networking.	1														
		CO2	Understand Cyber Physical Systems and Cyber security in Industry 4.0.	2	3													
		CO3	Knowledge of theory related to Industrial IoT Systems	3		1												
		CO4	Ability to implement real case studies by gained knowledge of Industrial applications with IoT capability	2		2	2											
BTEEP802	Entrepreneurship Essentials	CO1	Analyze the data, information and knowledge.				3	1										
		CO2	Define the concept of marketing.	1	2													
		CO3	Identify projectand work for community development.		3					2	1		3					
		CO4	Analyze the business model.				3	1	1									
BTEEP803	Project II	CO1	Demonstrate an understanding of the fundamental principles of electrical Engineering and apply them to the design and development of a complex electrical system	3		2	2					2		2	2	2		
		CO2	Conduct research and analyze existing litrature in the field of Electrical Engineering to identify the latest trends and technologies		3						2							
		CO3	Use advanced software tools and techniques to design, simulate and test electrical system	2		2	2	3								2	2	
		CO4	Work effectively in a in a team to plan manage and execute the project and communicate progress and outcomes						3				1		2			
		CO5	Develope skills in project management, time management and organization							3					2			