Shree Santkrupa Institute of Engineering and Technology

Department of Electrical Engineering

Academic Year: 2021-22

Semester: III

Sr. No.	Course Code	Course Name	Lecture	Tutorial	Practical	Credit
1	BTBS301	Engineering Mathematics-III	3	1	0	4
2	BTEEC302	Electrical Machines-I	3	1	0	4
3	BTEEC303	Electrical and Electronics Measurement	3	1	0	4
4	BTHM304	Basic Human Rights	2	0	0	AUDIT
5	BTES305	Engineering Material Science	3	0	0	3
6	BTEEL306	Electrical Machines-I Lab	0	0	2	1
7	BTEEL307	Electrical and Electronics Measurement Lab	0	0	2	1
8	BTEEM308	Mini Project-I	0	0	4	2
9	BTES211P	Internship-I Evaluation	0	0	0	1

Semester: IV

Sr. No.	Course Code	Course Name	Lecture	Tutorial	Practical	Credit
1	BTEEC401	Network Theory	3	1	0	4
2	BTEEC402	Power System	3	1	0	4
3	BTEEC403	Electrical Machine-II	3	1	0	4
4	BTBS404	Analog and Digital Electronics	3	0	0	3
5	BTEEPE405C	Advance Renewable Energy Sources	3	0	0	3
6	BTEEL406	Network Theory Lab	0	0	2	1
7	BTEEL407	Power System Lab	0	0	2	1
8	BTEEL408	Electrical Machine-II Lab	0	0	2	1
9	BTEEL409	Analog and Digital Electronics lab	0	0	2	1

Semester: V

Sr. No.	Course Code	Course Name	Lecture	Tutorial	Practical	Credit
1	BTEEC501	ELECTRICAL MACHINE-II	3	1	0	4
2	BTEEC502	POWER SYSTEM-II	3	1	0	4
3	BTEEC503	MICROPROCESSOR & MICROCONTROLLER	3	0	0	3
4	BTHM504	VALUE EDUCATION HUMAN RIGHTS & LEGISLATIVE PROCEDURE	2	0	0	Audit
5	BTEEE505C	TESTING & MAINTENANCE OF ELECTRICAL EQUIPMENTS	3	0	0	3
6	BTEEE506B	POWER PLANT ENGG	3	0	0	3
7	BTEEL507	ELECTRICAL MACHINE-II LAB	0	0	4	2
8	BTEEL508	POWER SYSTEM-II LAB	0	0	2	1
9	BTEEL509	MICROPROCESSOR & MICROCONTROLLER LAB	0	0	2	1
10	BTEEL510	IND.TRAINING	0	0	0	1

Semester: VI

Sr. No.	Course Code	Course Name	Lecture	Tutorial	Practical	Credit
1	BTEEC601	CONTROL SYSTEM	3	1	0	4
2	BTEEC602	PRINCIPLES OF ELECTRICAL MACHINE DESIGN	3	0	0	3
3	BTEEC603	POWER ELECTRONICS	3	1	0	4
4	BTEEE604A	IND AUTOMATION & CONTROL	3	0	0	3
5	BTEEE605A	SWITCHGEAR & PROTECTION	3	0	0	3
6	BTEEOE606B	PROJECT MANAGEMENT	3	0	0	3
7	BTEEL607	CONTROL SYSTEM LAB	0	0	2	1
8	BTEEL608	PRINCIPLES OF ELECTRICAL MACHINE DESIGN LAB	0	0	2	1
9	BTEEL609	POWER ELECTRONICS LAB	0	0	4	2

Semester: VII

Sr. No.	Course Code	Course Name	Lecture	Tutorial	Practical	Credit
1	BTEEC701	Power System Operation & Control	3	0	0	3
2	BTEEC702	High Voltage Engineering	3	0	0	3
3	BTEEC703	Electrical Drives	3	0	0	3
4	BTEEE704A	Special Purpose Electrical Machines	3	0	0	3
5	BTEEE705C	Elctrical Power Quality	3	0	0	3
6	BTEEL706	Power System Operation & Control Lab	0	0	2	1
7	BTEEL707	High Voltage Engineering Lab	0	0	2	1

8	BTEEL708	Electrical Drives Lab	0	0	2	1
9	BTEES709	Seminar	0	0	2	1
10	BTEEP710	Project Part-I	0	0	6	3
11	BTEEF711	FIELD TRAINING	0	0	0	1

Semester: VIII

Sr. No.	Course Code	Course Name	Lecture	Tutorial	Practical	Credit
1		High Power Multilevel Converters	3	0	0	3
2		Introduction to Industry 4.0 and Industrial Internet of Things	3	0	0	3
3	BTEEP803	Project - II	0	0	30	15

Course Outcomes

Semester : III		
Course Name		**Engineering Mathematics – III**
Course Code		**BTBS301**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, students will be able to:**
CO 1	Explain the application of the Laplace Transform to find solutions of system of linear equations arising in many engineering problem	
CO 2	Demonstarte and apply the concept Laplace Transform	
CO 3	Interpret Computation of Fourier Transform and their applications to engineering problems	
CO 4	Identify Partial Differential Equations and Their Applications.	
CO 5	Evaluate Functions of Complex Variables.	
Semester : III		
Course Name		**Electrical Machines-I**
Course Code		**BTEEC302**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Identify construction, working and application of single phase transformer & three phase transformer	
CO 2	Execute energy conservation principles	
CO 3	Determine construction, working and application of DC generator	
CO 4	Analyze behavior of DC motor	
CO 5	Implement knowledge for use of a special machine for a particular application	

Semester : III		
Course Name		**Electrical & Electronics measurements-TH**
Course Code		**BTEEC303**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Illustrate various types and applications of electronic instrument.	
CO 2	Classify various errors present in measuring instruments	
CO 3	Identify the condition of balance bridge to find unknown values.	
CO 4	Explain the working principle, selection criteria and applications of .various transducers used in measurement systems	
CO 5	Examine various types of electronic instrument suitable for specific measurement.	
Semester : III		
Course Name		**Engineering Material Science**
Course Code		**BTES305**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Get acquainted with semiconducting materials, metals and Superconductors and its various applications.	
CO 2	Apply electromagnetic field theory in electromagnetic energy conversion devices.	
CO 3	Analyze electromagnetic wave propagation and Poynting vector.	
CO 4	Evaluate behavior of materials in various applications.	
Semester : III		
Course Name		**Electrical Machines-I Lab**
Course Code		**BTEEL306**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Explain construction, working and application of single phase transformer	
CO 2	Identify operational behaviour of three phase transformer by taking different test	
CO 3	Demonstrate construction, working and application of DC generator	
CO 4	Distinguish behavior of DC motor by performing different test	
Semester : III		
Course Name		**Electrical & Electronics measurements-Lab**
Course Code		**BTEEL307**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Explain working and applications of C.R.O., Digital Storage C.R.O., C.R.O. Probes, Meggar, Tong-tester, P.F. Meter and Phase Shifter.	

CO 2	Measure power and power factor in 3-phase load by Two-wattmeter method.Measure low resistance by Crompton potentiometer, Kelvin's double bridge, and measure earth resistance using fall of potential method	
CO 3	Illustrate a single-phase energy meter by phantom loading at different power factors.	
CO 4	Determine the working principle, selection criteria and applications of various transducers used in measurement systems.	
CO 5	Examine various types of electronic instrument suitable for specific measurement.	
Semester : III		
Course Name		**Mini Project I**
Course Code		**BTEEM308**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Express a mini viable project idea (Hardware or Software Based) on recent trends in Electrical Engineering.	
CO 2	Analyze the Variouse Componenet & Design PCB.	
CO 3	Create the Programm Using MATLAB.	
CO 4	Demonstrate the Result.	
Semester : III		
Course Name		**Basic Human Rights**
Course Code		**BTHM 304**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Expain the history of human rights.	
CO 2	Recall responsibilities of others caste, religion, region and culture.	
CO 3	Remember the importance of groups and communities in the society.	
CO 4	Analyse the philosophical and cultural basis and historical perspectives of human	
CO 5	Aware of their responsibilities towards the nation.	
Semester : IV		
Course Name		**Network Theory**
Course Code		**BTEEC401**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Estimate and analyze D.C. circuits	
CO 2	Illustrate A.C and D.C circuits as complex engineering problems using first principle of mathematics	
CO 3	Demonstrate and formulate a solution plan and methodology for electrical circuit analysis using 'Network Theorems	
CO 4	"Modify appropriate mathematical tools such as Laplace Transform, Z- transform etc.	
CO 5	Evaluate special machine for a particular application & demonstrates different frictional kilowatt motors	
Semester : IV		
Course Name		**Advanced Renewable Energy Sources**

Course Code		**BTEEPE405C**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Find various renewable energy sources ,Fuel Cell	
CO 2	Illustrate various aspects of wind power plant.	
CO 3	Illustrate solar energy, various solar power collector and its applications.	
CO 4	Find Bio-Energy,and their classification its applications. & Induction Generators	
CO 5	Find of various storage batteries and interconnection technologies.	
Semester : IV		
Course Name		**Electrical Machine-II**
Course Code		**BTEEC403**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Describe basic concept for AC machine	
CO 2	Implement the winding of AC machine & harmonics	
CO 3	Identify Synchronous machine	
CO 4	Demonstrate construction & working of 3 phase Induction machine	
CO 5	Select a special machine & different frictional kilowatt motor for a particular application	
Semester : IV		
Course Name		**Power system-TH**
Course Code		**BTEEC402**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Analyze the general structure of power system	
CO 2	Impart the knowledge of generation of electricity based on conventional and nonconventional energy sources	
CO 3	Explain the concept of microgrid and distributed generation"	
CO 4	Identify the mechanical and electrical design aspects of transmission system	
CO 5	Enable the students to do analysis of different types of distribution systems and its design	
Semester : IV		
Course Name		**Network Theory Lab**
Course Code		**BTEEL406**

Course Outcome No	Course Outcome Statement	By the end of the course, the student will be able to:
CO 1	Establish relationship between measured data and Network Theorem to analyze the D.C. circuits	
CO 2	Illustrate measured data for trends and correlations to find step response of RC and RL circuit	
CO 3	Demonstrate proficiency in using Network Theorems to find required parameters of the circuit	
CO 4	Modify Network analysis techniques to determine parameters of Two Port Networks and their inter connections	
CO 5	Use techniques to evaluate capacitance and dielectric loss of an insulating material.	
Semester : IV		
Course Name		**Analog and digital Electronics**
Course Code		**BTBS404**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Explain the basic concept of transistor amplifier and operational amplifier.	
CO 2	Explain the basic logic gates and various reduction techniques of digital logic circuit in detail	
CO 3	Design combinational and sequential circuits	
CO 4	Explain reduction techniques using K-map	
CO 5	Analyze the operation of medium complexity standard combinational circuits.	
Semester : IV		
Course Name		**Power system-Lab**
Course Code		**BTEEL407**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Explain various aspects of design considerations of different type of power plant and electrical equipment.	
CO 2	Describe various aspects design of various components of distribution system. Calculate voltage drop, size of conductor,	
CO 3	Analyze various types of transmission line parameter to design transmission line and understand the sending end and receiving end circle diagram.	
CO 4	Acquire knowledge of substation, various electrical equipment, high voltage testing of electrical equipment, and flashover voltage testing of insulators	
CO 5	Apply techniques to evaluate capacitance and dielectric loss of an insulating material.	
Semester : IV		
Course Name		**Electrical Machine-II Lab**
Course Code		**BTEEL408**

Course Outcome No	Course Outcome Statement	By the end of the course, the student will be able to:
CO 1	Identify construction, working and application of Sunchronous by performing various test	
CO 2	Determine operation of induction motor by performing blocked rotor test	
CO 3	Illustrate Starting methods of Induction motors	
CO 4	Analyze Speed controling methods of Induction motors	
Semester : IV		
Course Name		**Analog and digital Electronics Lab**
Course Code		**BTEEL409**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Explain the basic concept of transistor amplifier.	
CO 2	Verify the operation of operational amplifier.	
CO 3	Analyze the working of basic logic gates	
CO 4	Analyze the operation of combinational circuits.	
CO 5	Design various code converters	
Semester : V		
Course Name		**Electrical Machine II**
Course Code		**BTEEC501**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Explain basic concept for AC machine	
CO 2	Describe winding of AC machine & Harmonics	
CO 3	Recognize Synchronous machine	
CO 4	Demonstrate construction & working of 3 phase Induction machine	
CO 5	Implement special machine for a particular application & demonstrates different frictional kilowatt motors	
Semester : V		
Course Name		**Power Plant Engg-TH**
Course Code		**BTEEE506B**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Recall the basics of Power Plants.	
CO 2	Compare the power generation by renewable and non-renewableenergy resources"	
CO 3	Classify the different types of cycles and natural resources used in powerplants and their applications. "	

CO 4	Illustrate the principle of construction and operation of different conventional power plants.	
CO 5	Determine basic components of power system, energy sources	
Semester : V		
Course Name		**MICROPROCESSOR AND MICROCONTROLLER**
Course Code		**BTEEC503**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Explain the architecture of Microprocessor 8085 and its operation.	
CO 2	Identify the different ways of interfacing memory and I/O with 8085 microprocessor	
CO 3	Design microprocessor I/O ports in order to interface the processor tovarious devices .	
CO 4	Explain the architecture, operation and instruction set of microcontroller(8051)	
CO 5	Identify the different ways of interfacing and programming with microcontroller.	
Semester : V		
Course Name		**MICROPROCESSOR AND MICROCONTROLLER LAB**
Course Code		**BTEEL509**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Explain the architecture of Microprocessor 8085 and its operation.	
CO 2	Design and implement Assembly language programs on 8085 microprocessor.	
CO 3	Design interfacing circuits with 8085	
CO 4	Design and implement programs on 8085 microprocessor	
CO 5	Design programs on Arithmetic Operations.	
Semester : V		
Course Name		**Electrical Machine II LAB**
Course Code		**BTEEL507**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Classify different methods of speed control of AC Motor	
CO 2	Execute different performance test on AC Motor	
CO 3	Determine different operating characteristics of AC Machine	
Semester : V		
Course Name		**Power System II**
Course Code		**BTEEC502**

Course Outcome No	Course Outcome Statement	By the end of the course, the student will be able to:
CO 1	Know the fundamental concepts of power system.	
CO 2	To study different parameters of power system operation and control	
CO 3	Analyze load flow and Diff. methods of reactive power control.	
CO 4	Evaluate diff. methods of fault analysis	
CO 5	Illustrate diff. methods of stability study	
Semester : V		
Course Name		**Power System II Lab**
Course Code		**BTEEL508**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Know the fundamental concepts of power system.	
CO 2	Analyze different types of short-circuit faults which occur in power systems	
CO 3	To study load flow and Diff. methods of reactive power control.	
CO 4	Evaluate diff. methods of fault analysis and stability study using MATLAB	
CO 5	To solve optimal power flow problem.	
Semester : V		
Course Name		**VALUE EDUCATION HUMAN RIGHTS & LEGISLATIVE PROCEDURE**
Course Code		**BTHM504**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Understand value of education and self-development	
CO 2	Develop good values and character	
CO 3	Know Human right and legislative procedure	
CO 4	Expain the history of human rights.	
CO 5	Remember the importance of groups and communities in the society.	
CO 6		
Semester : VI		
Course Name		**SWITCHGEAR & PROTECTION**
Course Code		**BTEEE605A**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Explain principles of protective relaying, Different types of switchgear	

CO 2	Explain principle of construction, operation and selection of different type of circuit breaker used in power system	
CO 3	Interprt Digital And Numerical Protection	
CO 4	Construct Bus bar & relay	
CO 5	Experiment of Protection of Alternators and Transformers	
CO 6	Function Insulation co-ordination and over current protection	
Semester : VI		
Course Name		**SWITCHGEAR & PROTECTION**
Course Code		**BTEEE605A**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	verify characteristics of Static Overcurrent Relay,Overvoltage , HRC MCB ELCB	
CO 2	demonstrate working of Distance Protection Scheme for long transmission line,Transformer ,Alternator	
CO 3	Identify the components of different types of circuit breakers with their specifications (through visits/ videos/models)	
Semester : VI		
Course Name		**Principal of Electrical Machine Design**
Course Code		**BTEEC602**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Describe principles of electric machine design.	
CO 2	Identify design of different electric apparatus	
CO 3	Implement design of AC & DC windings	
CO 4	Distinguish heating, cooling & Ventilation	
CO 5	Demonstrate Transformer,CAD and use it for transformer design	
Semester: VI		
Course Name		**Project Management**
Course Code		**BTEEOE606B**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Write concepts of project management.	
CO 2	Evaluate a project plan.	
CO 3	Develop the project implementation strategy.	
CO 4	Analyze post project affects.	
Semester: VI		
Course Name		**Control System**
Course Code		**BTEEC601**

Course Outcome No	Course Outcome Statement	By the end of the course, the student will be able to:
CO 1	Identify components of a control system & Solve the Transfer Function	
CO 2	Analyse Time Domain Responce	
CO 3	Analyse Frequency Domain Responce & Build the root locus, Bode Plot,polar plot	
CO 4	Classify & design PID controller.	
CO 5	Analyse state variable technique. Solve Variable Technicque	
Semester: VI		
Course Name		**Control System Lab**
Course Code		**BTEEL607**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Creat & Solve the Programme of Transfer Function	
CO 2	Creat & Solve the Programme of Transfer Function Test Signals	
CO 3	Creat & Solve the Programme of Transfer Function Bode Plot &Nyquist Plot using MATLAB	
CO 4	Design The PID Controllers	
CO 5	Creat & Solve the Programme of Sate Space Model	
Semester : VI		
Course Name		**POWER ELECTRONICS**
Course Code		**BTEEC603**
Course Outcome No	**Course Outcome Statement**	**After end of this course, students will be able to:**
CO 1	Define principle of construction,operation and characteristics of basic semiconductor devices.	
CO 2	Relate knowledge about various power semiconductor devices	
CO 3	Apply and analyze performance of DC to DC converters,DC to AC converters.	
CO 4	Analyze performance of AC voltage controller.	
CO 5	Design performance of controlled and uncontrolled converters.	
Semester : VI		
Course Name		**POWER ELECTRONICS LAB**
Course Code		**BTEEL609**
Course Outcome No	**Course Outcome Statement**	**After end of this course, students will be able to:**
CO 1	Define the characteristics of various power electronics devices.	
CO 2	Compare different phase controlled converter	

CO 3	Identify three phase bridge inverter	
CO 4	Analyze Single phase controlled converter	
CO 5	Design the Single phase inverter	
Semester : VI		
Course Name		**Industrial Automation and Control**
Course Code		**BTEEE604A**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Analyze different methods of industrial measurement.	
CO 2	Know the new trends in industrial process control.	
CO 3	Familiar with various automation technologies in manufacturing and process industries.	
CO 4	Familiar with various communication technologies in manufacturing and process industries.	
CO 5	Design and implement electro-pneumatic/hydraulic solutions for automated systems	
Semester : VI		
Course Name		**Principal of Electrical Machine Design Lab**
Course Code		**BTEEL608**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Remember all electrical Symbols & Electrical Installation	
CO 2	Synthesis design of DC Machine	
CO 3	Implement design of AC Machine	
CO 4	Illustrate Design of Transformer	
Semester : VII		
Course Name		**Special Purpose Electrical Machine**
Course Code		**BTEEE704A**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Describe construction, working and application of Synchronous reluctance motor	
CO 2	Explain construction, working and application of stepping moto	
CO 3	Discuss construction, working and application of switched reluctance motor	
CO 4	Illustrate construction, working and application of permanent magnet brushless DC motor and of P.M. synchronous motor	
CO 5	Reveal behavior of induction generator and induction machineation	
Semester : VII		
Course Name		**Electrical Power Quality**
Course Code		**BTEEE705C**

Course Outcome No	Course Outcome Statement	By the end of the course, the student will be able to:
CO 1	Explain power Quality issues	
CO 2	Use technique to reduce Sag and interruption	
CO 3	Describe long duration variation and its mitigation technique	
CO 4	Analyses harmonic related problems and also understand IEEE standardsr	
CO 5	Identify grounding related problems and power quality improving equipment’s	
Semester : VII		
Course Name		**Project Phase 1**
Course Code		**BTEEP710**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Execute the technical knowledge acquired in the program for solving real world problems.	
CO 2	Implement new technologies & design techniques (platform, database, etc.) concerned for devising a solution for a given problem statement	
CO 3	Use project management skills (scheduling work, procuring parts and documenting Expenditures and working within the confines of a deadline).	
CO 4	Construct with team mates, sharing due and fair credits and collectively apply effort for making project successful.	
CO 5	Differentiate technical information by means of written and oral reports.	
Semester: VII		
Course Name		**Electrical Drives**
Course Code		**BTEEC703**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Analyze the dynamics of Electrical Drives System	
CO 2	Use various control techniques for controlling the speed of AC and DC motor.	
CO 3	Analyze the DC drives.	
CO 4	Analyze the AC drives.	
CO 5	To select/recommend the appropriate Drive according to the particular application.	
CO 6	State the recent technology of AC and DC drive	
Semester : VII		
Course Name		**Seminar**
Course Code		**BTEES709**

Course Outcome No	Course Outcome Statement	By the end of the course, the student will be able to:
CO 1	Evaluate the exact title of the seminar.	
CO 2	Define the motivation for selecting the seminar topic and its scope.	
CO 3	Search pertinent literature and information on the topic.	
CO 4	Critically review the literature and information collected.	
CO 5	Demonstrate effective written and verbal communication.	
Semester : VII		
Course Name		**High Voltage Engineering**
Course Code		**BTEEC702**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Illustrate the concept of electric field stresses, applications of insulating materials and methods for non-destructive testing of equipments.	
CO 2	Explain the breakdown process in solid, liquid, and gaseous materials	
CO 3	Categorize methods for generation and measurement of High Voltages and Currents (both AC & DC)	
CO 4	Describe the phenomenon of over-voltage and choose appropriate insulation coordination levels based on IS & IEC Standards.	
CO 5	Demonstrate high voltage test of materials and apparatus	
Semester : VII		
Course Name		**High Voltage Engineering Lab**
Course Code		**BTEEL707**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Design and development of high voltage equipments and utility establishment.	
CO 2	Illustrate and measure the magnitude of HVDC, HVAC (power frequency & high frequency) and impulse by different measurement schemes.	
CO 3	Use high voltage test of materials and apparatus.	
CO 4	Verify the form of discharges in Gaseous, Liquid and Solid dielectrics.	
Semester : VII		
Course Name		**Power System Operation & Control**
Course Code		**BTEEC701**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Explain the fundamental concept of power system.	
CO 2	Design the mathematical model of synchronous machine.	

CO 3	Design the mathematical model Excitation system and speed governing system.	
CO 4	Analyze the transient stability of power system using swing equation and equal areacriteria.	
CO 5	Analyze the economic operation of power system.	
Semester : VII		
Course Name		**Power System Operation & Control lab**
Course Code		**BTEEL706**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Explain the fundamental concept of power system.	
CO 2	Design the mathematical model of synchronous machine.	
CO 3	Design the mathematical model Excitation system and speed governing system.	
CO 4	Analyze the transient stability of power system using swing equation and equal areacriteria.	
CO 5	Analyze the economic operation of power system.	
Semester: VII		
Course Name		**Electrical Drives Lab**
Course Code		**BTEEL708**
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Use various control techniques for controlling the speed of AC and DC motor.	
CO 2	Simulate various AC drive system	
CO 3	Simulate various DC drive system	
Semester: VIII		
Course Name		**High Power Multilevel Converter**
Course Code		
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Define the Multilevel Converters: concept and fundamentals.	
CO 2	Analysis, design, and implementation of low frequency control of multilevel inverters.	
CO 3	Evaluate Modular Multilevel Converters (MMCs): Generalized approach to develop higher voltage level inverters.	
CO 4	Compile the operation and comparison of various multilevel converter topologies.	
CO 5	Develop and implement control for multi-voltage level inverters.	
Semester : VIII		
Course Name		**Introduction to Industry 4.0 and Industrial Internet of Things**
Course Code		

Course Outcome No	Course Outcome Statement	By the end of the course, the student will be able to:
CO 1	Describe Industrial Internet of Things and Cyber Physical manufacturing	
CO 2	Demonstrate Cyber Physical and Cyber Manufacturing systems	
CO 3	Describe Architectural design patterns for industrial Internet of Things	
CO 4	Analyse AI and data Analytics for Industrial Internet of Things	
CO 5	Evaluation of Workforce and Human Machine Interaction and Application of Industrial Internet of Things	
Semester : VIII		
Course Name	**Project-II**	
Course Code	**BTEEP803**	
Course Outcome No	**Course Outcome Statement**	**By the end of the course, the student will be able to:**
CO 1	Demonstrate literature survey and technical pre-requisites of the selected project topic.	
CO 2	Predict the challenges in practical implementation of the project hardware/software and draft their possible alternate solutions.	
CO 3	Design engineering solutions of complex problems utilizing systems and engineering approach.	
CO 4	Practically fabricate /implement, test /debug and run/simulate the project (hardware/software)	
CO 5	Communicate with the engineering community in written and oral forms.	