



CSMSS

Chhatrapati Shahu Maharaj Shikshan Sanstha's

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Approved by AICTE New Delhi, DTE (Govt. of Maharashtra) and affiliated to Dr. BATU, Lonere (Raigad). **DTE Code: 2533**

DEPARTMENT OF ELECTRICAL ENGINEERING 2022-23

SEME STER	SUBJECT CODE	NAME OF THE	CO	COURSE OUTCOMES
III	BTBS301	ENGINEERING MATHEMATICS – III	CO-1	STUDENTS WILL BE ABLE TO IDENTIFY THE TRANSFORMS OF SPECIAL FUNCTIONS SUCH AS PERIODIC FUNCTIONS, HEAVISIDE-UNIT STEP FUNCTION, AND DIRAC DELTA FUNCTION.
			CO-2	STUDENTS WILL BE ABLE TO APPLY LAPLACE & INVERSE LAPLACE TRANSFORM METHODS TO SOLVE LINEAR DIFFERENTIAL EQUATIONS AND SYSTEMS WITH CONSTANT COEFFICIENTS.
			CO-3	STUDENTS WILL BE ABLE TO APPLY FOURIER TRANSFORMS AND INTEGRAL PROPERTIES, INCLUDING SINE AND COSINE INTEGRALS AND PARSEVAL'S IDENTITY, TO TRANSFORM
			CO-4	STUDENTS WILL BE ABLE TO APPLY TECHNIQUES TO FORM AND SOLVE PARTIAL DIFFERENTIAL EQUATIONS, INCLUDING
			CO-5	STUDENTS WILL BE ABLE TO DESCRIBE HOW HARMONIC FUNCTIONS IN CARTESIAN FORM ARE DERIVED AND THEIR RELATIONSHIP WITH ANALYTIC FUNCTIONS.
			CO-6	STUDENTS WILL BE ABLE TO SOLVE THE COMPLEX FUNCTION WITH REFERENCE TO THEIR ANALYTICITY, INTEGRATION USING CAUCHY'S INTEGRAL AND RESIDUE THEOREMS
///	BTEEC302	ENGINEERING MACHINE I	CO-1	ACQUIRE KNOWLEDGE ABOUT THE CONSTRUCTIONAL DETAILS, PRINCIPLE OF OPERATION AND APPLICATIONS OF SINGLE PHASE & THREE PHASE TRANSFORMERS..
			CO-2	LEARN TO CALCULATE LOSSES, EFFICIENCY, VOLTAGE REGULATION AND OTHER PARAMETERS OF TRANSFORMERS BY CONDUCTING DIFFERENT ROUTINE & TYPE TESTS.
			CO-3	UNDERSTAND ELECTROMAGNETIC ENERGY CONVERSION PRINCIPLES AND CLASSIFICATION OF ELECTRICAL MACHINES.
			CO-4	ACQUIRE KNOWLEDGE ABOUT THE CONSTRUCTIONAL DETAILS AND PRINCIPLE OF OPERATION OF DC MOTORS & GENERATORS.
			CO-5	ACQUIRE KNOWLEDGE OF EMF EQUATIONS, TORQUE EQUATIONS, CHARACTERISTICS & STARTING METHODS OF DIFFERENT ELECTRICAL DC MACHINES.
			CO-1	DEFINE FUNDAMENTALS OF 3-PHASE AND 1-PHASE INDUCTION MACHINES AND SYNCHRONOUS MACHINES

			CO-6	ACQUIRE KNOWLEDGE OF CONSTRUCTION DETAILS AND PRINCIPLE OF WORKING OF SPECIAL PURPOSE MACHINES SUCH AS BRUSH LESS DC MOTOR, STEPPER MOTOR, And RELUCTANCE MOTOR & VARIABLE RELUCTANCE MOTOR
			CO-1	DEFINE GENERALIZED MEASUREMENT & INSTRUMENTATION SYSTEM WITH THE HELP OF A BLOCK DIAGRAM, ITS PROPERTIES AND FUNDAMENTALS.
III	(BTEEC303)	ELECTRICAL AND ELETRONICS MEASUREMEMENT	CO-2	CHOOSE THE SUITABLE METHOD FOR MEASUREMENT OF ACTIVE, REACTIVE POWERS AND ENERGY.
			CO-3	APPLY THE SUITABLE METHOD FOR MEASUREMENT OF RESISTANCE, INDUCTANCE AND CAPACITANCE.
			CO-4	EXPRESS DIGITAL MEASUREMENT OF ELECTRICAL QUANTITIES WITH THE HELP OF BLOCK DIAGRAM
			CO-5	IDENTIFY THE TRANSDUCERS AND ITS USE FOR MEASUREMENT OF FORCE, TORQUE, VELOCITY, ACCELERATION
			CO-6	ACQUIRE KNOWLEDGE OF CONSTRUCTION DETAILS AND PRINCIPLE OF WORKING OF SPECIAL PURPOSE MACHINES SUCH AS BRUSH LESS DC MOTOR, STEPPER MOTOR, And RELUCTANCE MOTOR & VARIABLE RELUCTANCE MOTOR
III	BTHM304	BASIC HUMAN RIGHT	CO-1	DESCRIBE BASIC CONCEPTS OF HUMAN RIGHTS.
			CO-2	INTERPRET THE HISTORY OF THE DEVELOPMENT OF HUMAN RIGHTS.
			CO-3	EXPLAIN THE INTERRELATIONSHIP OF SOCIETY, RELIGION AND CULTURE.
			CO-4	RELATE TO THE SOCIAL STRUCTURE AND SOCIAL PROBLEMS.
			CO-5	PRACTICE COLLECTIVE ACTIONS FOR THE BETTERMENT OF SOCIETY.
			CO-6	CORRELATE TO THE HUMAN RIGHTS CONSTIOTUTED IN THE CONSTITUTION OF INDIA.
III	(BTES305)	ENGINEERING MATERIAL SCIENCE	CO-1	STUDENT WILL ABLE TO DESCRIBE THE KEY CONCEPTS OF ELECTRICAL CONDUCTION, INCLUDING CRYSTAL STRUCTURES, ATOMIC BONDING, AND FACTORS AFFECTING CONDUCTIVITY IN METALS AND OTHER MATERIALS
			CO-2	STUDENT WILL ABLE TO EXPLAIN THE CHARACTERISTICS AND APPLICATIONS OF DIELECTRIC MATERIALS, INCLUDING POLARIZATION TYPES, DIELECTRIC STRENGTH, AND THE EFFECTS OF TEMPERATURE
			CO-3	STUDENT WILL ABLE TO EXPLAIN KNOWLEDGE OF SEMICONDUCTOR PROPERTIES AND INTEGRATION TECHNIQUES TO ANALYZE AND SOLVE PROBLEMS RELATED TO ELECTRON-HOLE CONCENTRATION CARRIER

			CO-4	STUDENT WILL ABLE TO ANALYZE THE PROPERTIES AND CLASSIFICATION OF MAGNETIC MATERIALS, INCLUDING
			CO-5	STUDENT WILL ABLE TO CLASSIFY THE PROPERTIES AND APPLICATIONS OF REFRACTORY, STRUCTURAL, AND RADIOACTIVE MATERIALS, AND
IV	(BTEEC401)	NETWORK THEORY	CO-1	STUDENT WILL ABLE TO DESCRIBE BASIC COMPONENTS OF ELECTRIC NETWORK
			CO-2	STUDENT WILL ABLE TO DISCUSS NETWORK THEOREMS TO SIMPLIFY COMPLEX NETWORKS.
			CO-3	STUDENT WILL ABLE TO ILLUSTRATE TRANSIENT ANALYSIS IN ELECTRICAL CIRCUITS AND ANALYZE THE POWER SYSTEM STABILITY.
			CO-4	STUDENT WILL ABLE TO SOLVE LAPLACE TRANSFORM FOR ELECTRIC NETWORK ANALYSES AND EVALUATE THE PARAMETERS OF TWO PORT NETWORKS
			CO-5	STUDENT WILL ABLE TO EXAMINE VARIOUS TYPES OF FILTERS.
IV	(BTEEC402)	POWER SYSTEM	CO-1	LIST THE DIFFERENT SOURCES OF ENERGY AND IDENTIFY THE MAJOR ELECTRICAL EQUIPMENT IN GENERATING STATIONS.
			CO-2	CALCULATE THE INDUCTANCE AND CAPACITANCE OF SINGLE-PHASE AND THREE-PHASE LINES.
			CO-3	CONCLUDE THE DISTRIBUTION OF VOLTAGE ACROSS THE INSULATOR STRING AND DETERMINE STRING EFFICIENCY.
			CO-4	EXPLAIN THE CLASSIFICATION AND PERFORMANCE OF TRANSMISSION LINES.
			CO-5	ILUSTRATE THE DESIGN AND PERFORMANCE OF DC DISTRIBUTION SYSTEMS, INCLUDING ALL TYPES OF DC SYSTEMS.
IV	(BTEEC403)	ELECTRICAL MACHINE 2	CO-2	COMPARE VARIOUS PARAMETERS OF AC ELECTRIC MACHINES
			CO-3	IDENTIFY AND ORGANIZE THE CHARACTERISTICS OF DIFFERENT AC ELECTRICAL MACHINES
			CO-4	DEVELOP THE CIRCUIT MODEL OF AC ELECTRICAL MACHINES
			CO-5	JUSTIFY VARIOUS AC ELECTRICAL MACHINES
			CO-6	CONSTRUCT THE CONTROL OPERATIONS AND FORMULATE VARIOUS TESTS ON ELECTRICAL MACHINES
IV	(BTBS404)	ANALOG AND DIGITAL ELECTRONICS	CO-1	STUDENT WILL ABLE TO INTERPRET DIFFERENT ELECTRONICS CIRCUITS.

			CO-2	STUDENTS WILL BE ABLE TO EXTEND KNOWLEDGE OF WORKING PRINCIPLES OF OP-AMP
			CO-3	STUDENTS WILL BE ABLE TO SHOW BASIC NUMBER SYSTEM.
			CO-4	STUDENTS WILL BE ABLE TO DEMONSTRATE DEIGN AND CHARACTERISTICS OF DIGITAL LOGIC GATES.
			CO-5	STUDENTS WILL BE ABLE TO S SUMMARIZE TECHNIQUES USED IN DIGITAL CIRCUITS.
			CO-6	STUDENTS WILL BE ABLE TO DEMONSTRATE USE OF DIGITAL SYSTEMS.
IV	(BTEEPE405)	ADAVANCE RENEWABLE ENERGY SOURECS	CO-1	STUDENT WILL ABLE TO IDENTIFY THE PRINCIPLES OF RENEWABLE ENERGY SYSTEMS AND LIST VARIOUS ASPECTS OF ENERGY CONVERSION AND MANAGEMENT OPTIONS IN MODERN POWER
			CO-2	STUDENT WILL ABLE TO DIFFERENTIATE BETWEEN VARIOUS WIND ENERGY CONVERSION DEVICES, THEIR CLASSIFICATIONS, AND THE FACTORS INFLUENCING WIND ENERGY GENERATION, INCLUDING SITE
			CO-3	STUDENT WILL ABLE TO CALCULATE AND ANALYZE THE PERFORMANCE AND APPLICATIONS OF PHOTOVOLTAIC SYSTEMS AND SOLAR THERMAL COLLECTORS, INCLUDING THEIR ECONOMIC, ENVIRONMENTAL AND SOCIAL IMPLICATIONS
			CO-4	STUDENT WILL ABLE TO CATEGORIZE AND EVALUATE BIOMASS RESOURCES AND CONVERSION PROCESSES, INCLUDING THERMO-CHEMICAL, BIOCHEMICAL, AND CHEMICAL METHODS, AS WELL AS ANALYZE THE PRINCIPLES AND OPERATION OF INDUCTION
			CO-5	STUDENT WILL ABLE TO COMPARE ENERGY STORAGE SYSTEMS AND THEIR INTEGRATION WITH ALTERNATIVE ENERGY SOURCES, INCLUDING DIFFERENT STORAGE TECHNOLOGIES, ECONOMIC CONSIDERATIONS, AND INTERCONNECTION TECHNOLOGIES.
V	(BTEEC501)	POWER SYSTEM ANALYSIS	CO-1	ABLE TO DEFINE THE SINGLE LINE DIAGRAM FOR THE ELECTRICAL POWER SYSTEM
			CO-2	ABLE TO EXPLAIN THE SYMMETRICAL COMPONENTS IN A POWER SYSTEM

			CO-3	ABLE TO SOLVE FOR THE SYMMETRICAL & UNSYMMETRICAL FAULTS IN A POWER SYSTEM
			CO-4	ABLE TO COMPARE BETWEEN THE DIFFERENT LOAD FLOW ANALYSIS METHODS USED IN A POWER SYSTEM
			CO-5	ABLE TO DETERMINE THE SHORT CIRCUIT MVA FOR SYMMETRICAL FAULTS FOR DESIGN OF RATING OF CIRCUIT BREAKER
			CO-6	ABLE TO EVALUATE THE PER UNIT REACTANCE DIAGRAM FOR GIVEN SYSTEM
V	(BTEEC502)	MICROPROCESSOR AND MICROCONTROLLER	CO-1	STUDENTS WILL BE ABLE TO EXPLAIN THE ARCHITECTURE OF 8085.
			CO-2	STUDENTS WILL BE ABLE TO EXPLAIN INTERFACING FEATURES OF 8085.
			CO-3	STUDENTS WILL BE ABLE TO USE INTERRUPT FEATURES OF 8085.
			CO-4	STUDENTS WILL BE ABLE TO EXPRESS PROGRAM FOR BASIC APPLICATIONS.
			CO-5	STUDENTS WILL BE ABLE TO EXPLAIN THE ARCHITECTURE AND INTERFACING ALSO INTERRUPT FEATURES OF 8051.
V	(BTEEC503)	POWER ELECTRONICS	CO-1	STUDENTS WILL BE ABLE TO LIST THE CHARACTERISTICS AND OPERATIONS OF POWER SEMICONDUCTOR DEVICES.
			CO-2	STUDENTS WILL BE ABLE TO DESCRIBE THE TURN-ON AND TURN-OFF MECHANISMS FOR POWER SEMICONDUCTOR DEVICES.
			CO-3	STUDENTS WILL BE ABLE TO EXPLAIN THE CONCEPT OF PHASE-CONTROLLED RECTIFICATION AND ITS IMPACT ON POWER FACTOR.
			CO-4	STUDENTS WILL BE ABLE TO DESCRIBE THE OPERATION OF SINGLE-PHASE AND THREE-PHASE CYCLOCONVERTERS.
V	(BTEEPLE504)	POWER QUALITY ISSUES	CO-1	DEFINE DIFFERENT TYPES OF POWER QUALITY ISSUES
			CO-2	EXPLAIN TRANSIENT OVER VOLTAGE, DEVICES FOR OVER VOLTAGE PROTECTION

			CO-3	EXPLAIN SOURCES OF HARMONICS, EFFECTS OF HARMONICS DISTORTION, STANDARDS OF HARMONICS
			CO-4	EXPLAIN DEVICES FOR VOLTAGE REGULATION, UTILITY VOLTAGE REGULATION APPLICATION
			CO-5	EXPLAIN POWER QUALITY MEASURING INSTRUMENTS AND EQUIPMENTS
V	(BTEEOE505)	ELCTRICAL SAFTY	CO-1	IDENTIFY AND UTILIZE APPROPRIATE SAFETY EQUIPMENT FOR MITIGATING PRIMARY AND SECONDARY ELECTRICAL HAZARDS.
			CO-2	DEMONSTRATE THE CORRECT GROUNDING AND BONDING TECHNIQUES FOR DIFFERENT ELECTRICAL SYSTEMS AND APPLY SAFETY METHODS FOR HIGH-VOLTAGE OPERATIONS.
			CO-3	DEVELOP AND IMPLEMENT AN EFFECTIVE ELECTRICAL SAFETY PROGRAM, INCLUDING ACCIDENT PREVENTION, SAFETY MEETINGS, AND INVESTIGATION PROTOCOLS.
			CO-4	ADMINISTER RELIABILITY-CENTERED MAINTENANCE PRINCIPLES TO DEVELOP MAINTENANCE SCHEDULES AND REQUIREMENTS FOR ELECTRICAL EQUIPMENT.
			CO-5	INTERPRET AND RELATE ELECTRICAL SAFETY STANDARDS AND REGULATIONS WITH VARIOUS REGULATORY BODIES TO ENSURE COMPLIANCE IN ELECTRICAL PRACTICES.
VI	(BTEEC601)	SWITCGEAR AND PROTECTION	CO-1	Understand the necessity of power system protection, including fault effects, relay requirements, and types of protective devices.
			CO-2	Describe various static and numerical relays, including their operating principles and applications in fault detection and recording..
			CO-3	Explain the function and characteristics of different types of circuit breakers and fuses, including their selection and testing methods.
			CO-4	Analyze the protection schemes for transmission lines, including overcurrent and distance protection methods
			CO-5	Evaluate the differential protection strategies for alternators and transformers, including the challenges and standards associated with
VI	(BTEEC602)	ELECTRICAL MACHINE DESIGN	CO-1	TO RECALL THE CONCEPT AND ABILITY TO ANALYZE THE MAGNETIC MATERIALS AND MAGNETIC CIRCUITS IN ELECTRICAL MACHINES
			CO2	TO IDENTIFY AND DESIGN THE DIFFERENT TYPES OF WINDING
			CO-3	TO DISTINGUISH THE CHARACTERISTICS AND APPLICATION OF INDUCTION MOTOR STATOR

			CO-4	TO DISTINGUISH THE CHARACTERISTICS AND APPLICATION OF INDUCTION MOTOR ROTOR
			CO-5	TO ASSESS THE KNOWLEDGE OF FUNDAMENTALS, CONSTRUCTION DETAILS AND CLASSIFICATION OF HEATING , COOLING, VENTILATION
VI	(BTEEC603)	CONTROL SYSTEM ENGINEERING	CO-1	COMPUTE TRANSFER FUNCTION OF LINEAR TIME INVARIANT SYSTEMS
			CO-2	DESCRIBE OPERATION OF VARIOUS CONTROL SYSTEM COMPONENTS
			CO-3	ANALYZE AND EVALUATE LINEAR SYSTEMS IN TIME DOMAIN
			CO-4	ANALYZE AND EVALUATE OF LINEAR TIME INVARIANT SYSTEMS IN FREQUENCY DOMAIN
			CO-5	EXPLAIN VARIOUS INDUSTRIAL CONTROLLERS
VI	(BTEEPE604)	SMART GRID TECHNOLOGY	CO-1	DISCUSS THE FEATURES OF SMART GRID & CONCEPT OF SMART METERING
			CO-2	DESCRIBE THE ARCHITECTURE OF SMART GRID & ITS COMPUTATIONAL TECHNIQUES.
			CO-3	MODEL AND CONSTRUCT SMART GRID WITH RENEWABLE ENERGY SOURCES.
			CO-4	EXPLAIN MODERN COMMUNICATION TECHNOLOGIES USED IN SMART GRID.
			CO-5	FORMULATE SOLUTIONS FOR CONTROLLING AND SECURITY OF SMART GRID.
VI	(BTEEOE605)	POWER PLANT ENGINEERING	CO-1	DESCRIBE CONVENTIONAL AND ALTERNATIVE ENERGY SOURCES, INCLUDING THEIR FUNCTIONS, CONTROL SYSTEMS, AND ECONOMIC CONSIDERATIONS IN POWER SYSTEMS.
			CO-2	COMPARE THE ELEMENTS AND OPERATIONAL CIRCUITS OF THERMAL STEAM AND HYDRO POWER PLANTS, INCLUDING SITE SELECTION,
			CO-3	EXPLAIN & EXAMINE THE SELECTION OF SITE AND OPERATION OF NUCLEAR REACTORS, INCLUDING THE FISSION PROCESS, POWER PLANT LAYOUT, AND COMPONENTS, AS WELL AS THE ADVANTAGES

			CO-4	CATEGORIZE DIFFERENT METHODS OF POWER GENERATION, INCLUDING SOLAR, WIND, TIDAL, BIOMASS, GEOTHERMAL, MAGNETO-HYDRO DYNAMIC, MICRO-HYDEL, AND FUEL CELLS.
			CO-5	DESIGN AND INTEGRATE PLANT SELECTION CRITERIA, GENERATOR SIZING, PARALLEL OPERATION, AND GRID MANAGEMENT, WHILE ADDRESSING ECONOMIC CONSIDERATIONS AND MAJOR ELECTRICAL
VII	(BTEEC701)	POWER SYSTEM OPERATION AND CONTROL	CO-1	DISCUSS THE NEED OF RAECTIVE POWER CORRECTION AND VOLTAGE DROP COMPENSATION AND IDENTIFY THE BEST METHODS FOR POWER FACTOR IMPROVEMENT AND VOLTAGE CONTROL
			CO-2	DEFINE POWER SYSTEM STABILITY WITH ITS APPLIICATIONS AND PROBLEM
			CO-3	EVALUATE THE MATHEMATICAL MODELS OF THE SPEED GOVERNING SYSTEMS, TURBINE AND EXCITATION SYSTEM
			CO-4	DISCRIBE SINGLE AREA LOAD FREQUENCY CONTROL AND TWO AREA LOAD FREQUENCY CONTROL.
			CO-5	DISCUSS THE ECONOMIC OPERATION OF POWER SYSTEM AND IMPORTANCE
VII	(BTEEC702)	HIGH VOLTAGE ENGINEERING	CO-1	ILLUSTRATE THE IMPORTANT CONCEPT OF HIGH VOLTAGE
			CO-2	EXPLAIN THE BREAKDOWN PROCESS IN SOLID, LIQUID, AND GASEOUS MATERIALS
			CO-3	DETERMINE METHODS FOR GENERATION AND MEASUREMENT OF HIGH VOLTAGES AND CURRENTS (BOTH AC AND DC)
			CO-4	DESCRIBE THE PHENOMENON OF OVER-VOLTAGE AND CHOOSE APPROPRIATE INSULATION COORDINATION LEVELS BASED ON IS & IEC STANDARDS.
			CO-5	DISCOVER THE PERSPECTIVES LAYOUT OF HIGH VOLTAGE LABORATORY & TESTING FACILITIES.
VII	(BTEEC703)	ELECTICAL DRIVE	CO-1	TO RECALL THE CONCEPT AND ABILITY TO ANALYZE THE ELECTRIC AND MAGNETIC MATERIALS AND MAGNETIC CIRCUITS IN ELECTRICAL MACHINES
			CO-2	TO CLASSIFY THE DIFFERENT COMPONENTS OF ELECTRIC MACHINE

			CO-3	TO IDENTIFY AND DESIGN THE DIFFERENT TYPES OF WINDING
			CO-4	TO DISTINGUISH THE CHARACTERISTICS AND APPLICATION OF DC MOTOR
			CO5	TO ASSESS THE KNOWLEDGE OF FUNDAMENTALS, CONSTRUCTION DETAILS AND CLASSIFICATION OF TRANSFORMER
VII	(BTEEE704)	ELECTRICAL TRACTION AND UTILIZATION	CO-1	TO RECALL THE KNOWLEDGE ABOUT THE ELECTRIC TRACTION SYSTEM
			CO-2	TO CLASSIFY THE TRACK ELECTRIFICATION
			CO-3	TO IDENTIFY THE CONSTRUCTIONAL FEATURES OF TRACTION MOTORS
			CO-4	TO DISTINGUISH THE CHARACTERISTICS AND APPLICATION OF DC MOTOR
			CO-5	TO ASSESS THE KNOWLEDGE OF FUNDAMENTALS, CONSTRUCTION DETAILS AND CLASSIFICATION OF TRACTION CONTROLS
VII	(BTEEE705)	ENERGY AUDIT AND CONSERVATION	CO-1	EXPLAIN DIFFERENT ENERGY SOURCES AND IMPORTANCE OF ENERGY CONSERVATION, GLOBAL ARMING AND EFFECTS OF GLOBAL ARMING
			CO-2	EXPLAIN DIFFERENT EFFORTS FOR ENERGY CONSERVATION , AND MECHANISM FOR REDUCTION OF CARBON EMMISSION
			CO-3	EXPLAIN ENERGY CONSERVATION OPORTUNITIES IN BIOLER, BIOLER EFFICIENCY CALCULATION
			CO-4	EXPLAIN ENERGY CONSERVATION OPORTUNITIES 5N ELECTRICAL APPLIANCES AND SYSTEM
			CO-5	DESCRIBE NETROK ANALYSIS IN MANAGEMENT, CALCULATION
VIII	(BTEEO801F)	INTRODUCTION TO INDUSTRY 4.0 AND IOT	CO-1	STUDENT WILL ABLE TO DEFINE THE BASICS OF NETWORKING AND SECURITY.
			CO-2	STUDENT WILL ABLE TO TO DESCRIBE PREDECESSOR OF IOT TECHNOLOGY AND EMERGENCE OFINTERNET OF THINGS

			CO-3	STUDENT WILL ABLE TO EXPLAIN ARCHITECTURE FOR INTERNET OF THINGS
			CO-4	STUDENT WILL ABLE TO ILLUSTRATE VARIOUS DEVICES, SENSORS, ACTUATORS, AND VARIOUS PROCESSING PARADIGMS FOR IOT.
			CO-5	STUDENT WILL ABLE TO USE INDUSTRIAL INTERNET OF THINGS (IIOT) AS AN APPLICATION OF IOT IN INDUSTRIES
VIII	(BT EEO80 2G)	ENETREPREN URSHIP ESSENTIALS	CO-1	IDENTIFY AND EVALUATE THE ESSENTIAL QUALITIES REQUIRED FOR ENTREPRENEURIAL SUCCESS, INCLUDING RESILIENCE, INNOVATION, AND LEADERSHIP.
			CO-2	DEVELOP STRATEGIES FOR TEAM MANAGEMENT AND MAINTAINING A POSITIVE TEAM CULTURE IN THE EARLY STAGES.
			CO-3	REVIEW HOW TO ASSESS THE FINANCIAL POSITION OF A COMPANY AT A SPECIFIC POINT IN TIME.
			CO-4	LLUSTRATE ADVANCED INNOVATION STRATEGIES, FOCUSING ON DESIGN-DRIVEN AND SYSTEMS THINKING APPROACHES.
			CO-5	EXPLAIN THE SUPPORT SYSTEMS AVAILABLE TO STARTUPS THROUGH INCUBATION AND ACCELERATION PROGRAMS.

Practical

SEMESTER	SUBJECT CODE	NAME OF THE SUBJECTS	CO	COURSE OUTCOMES
IV	BTEEL406	Network Theory	CO-1	Use Kirchhoff's current and voltage laws to analyze and solve electrical circuits in a laboratory setting.
			CO-2	Apply the superposition theorem to determine the response of linear circuits with multiple sources.
			CO-3	Determine the Thevenin equivalent circuit for a given complex network to simplify circuit analysis.
			CO-4	Determine the Norton equivalent circuit for a given complex network to simplify circuit analysis.
			CO-5	Apply the Maximum Power Transfer theorem to find the load resistance that maximizes power delivery in a circuit.
			CO-6	Use the Reciprocity theorem to validate circuit properties and relationships in different configurations.
			CO-7	Analyze the resonance frequency and impedance characteristics of an RLC series circuit.

			CO-8	Analyze the resonance behavior and impedance characteristics of a parallel RLC circuit.
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VI	(BTEEC602)	ELECTRICAL MACHINE DESIGN	CO-1	TO RECALL THE CONCEPT AND ABILITY TO ANALYZE THE MAGNETIC MATERIALS AND MAGNETIC CIRCUITS IN ELECTRICAL MACHINES
			CO2	TO IDENTIFY AND DESIGN THE DIFFERENT TYPES OF WINDING
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			CO-4	TO DISTINGUISH THE CHARACTERISTICS AND APPLICATION OF INDUCTION MOTOR ROTOR
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IV	BTEEL407	Power system	CO-1	Explain various aspects of design considerations of different types of power plant.
			CO-2	Describe various insulators & conductors with various components used in transmission and distribution system.
			CO-3	Discover various equipment's used in substation.
			CO-4	Student can determine different parameter used in cable.
			CO-5	Student can do survey on industrial visit and write report in details.

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III	BTEEL307	Electrical Electronics and Measurement	CO-1	Use AC bridges for the measurement of inductance, capacitance and frequency.
			CO-2	Identify different measuring instruments for the measurement of various electrical and non-electrical parameters.
			CO-3	use of various transducers for the measurement of physical quantities like temperature, pressure, distance and displacement.
			CO-4	Demonstrate the characteristics of Solar panel and earth

				resistance.
			CO-5	Analyze the errors present in measuring instruments and calibrate them.

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IV	BTEEL408	Electrical Machine II	CO-1	Explain the different Starting and speed control methods of 3-Phase Induction Motor.
			CO-2	Analyze the performance of 3-Phase Induction Motor Perform by conducting no-load and blocked rotor test
			CO-3	Formulate equivalent circuit parameters of an alternator and also its voltage regulation by different methods
			CO-4	Evaluate the synchronization of an alternator to infinite bus and control load sharing
			CO-5	Analyze the behavior of Synchronous motor at different loading conditions using V and inverted V curve.

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IV	BTEEL408	Electrical Machine II	CO-1	Students will be able to identify fault current under the symmetrical and unsymmetrical faults conditions
			CO-2	Students will be able to analyse power system studies by MATLAB

			CO-3	Students will be able to develop the Y-Bus Matrix
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V	BTEEL606	SWITCHGEAR AND PROTECTION LAB	CO-1	Verify and analyze the characteristics of static overcurrent and overvoltage relays, including IDMT and reverse power relays.
			CO-2	Demonstrate the operational principles of differential protection schemes for transformers, including their schematic diagrams.
			CO-3	Demonstrate the operational principles of differential protection schemes for alternators, including their schematic diagrams.
			CO-4	Identify and describe the components and specifications of various types of circuit breakers through practical demonstrations and models.