Shri Siddheshwar Devasthan, Solapur.
Shree Siddheshwar Women's College of Engineering, Solapur.
Approved by AICTE, New Delhi, Recognised by Govt. of Maharashtra & Affiliated to DBATU, Lonere
E-mail: office@sswcoe.edu.in |Website: www.sswcoe.edu.in |Phone0217- 2627227
T.P.S. II, Final Plot No. 74, Bhawani Peth, RupaBhawani Road, Solapur – 413002

Department of Electrical Engineering

Course outcomes of all courses

Second Year(SEM-III)	
Course Code: BTBS301	**Course Name:Engineering Mathematics-III**
CO'S	**After completion of the course students will be able to**
CO1	Solve problems related to laplace transform.
CO2	Solve higher order linear differential equation and applications to communication systems and signal processing.
CO3	Solve parseval's identity depends on the fourier transform, fourier sine transform and fourier cosine transform.
CO4	Solve one- dimensional heat equation and one- dimensional wave equation when IVP or BVP will be given
CO5	Perform contour integration of complex functions in the study of electrostatics and signal processing
Course Code: BTEEC302	**Course Name:Electrical Machine-I**
CO'S	**After completion of the course students will be able to**
CO1	To identify and describe about the construction and working ,also the parameters involved
CO2	Briefly explain about the construction and different connection of three phase transformer
CO3	Briefly explain about the electromechanical energy conservation
CO4	Detailed explanation about the construction , armature reaction , characteristics and mmf c
CO5	Explain operational behavior , characteristics , application and test carried out on dc motor
Course Code: BTEEC303	**Course Name:Electrical & Electronics Measurement**
CO'S	**After completion of the course students will be able to**
CO1	To develop the knowledge of theoretical and mathematical principles of electrical and electronics measuring instruments
CO2	Explain working and principles of analog measuring devices
CO3	To find different parameter of electrical quantities by using bride circuit
CO4	Explain working and principles of digital measuring devices

CO5	Describe transduced also explain about displyas and recorders
Course Code: BTHM305	**Course Name:Basic Human Rights**
CO'S	**After completion of the course students will be able to**
CO1	To become more aware of themselves, and their surroundings (family, society, nature)
CO2	They would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.
CO3	They would also become sensitive to their commitment towards what they have understood (human values, human relationship and human society).
CO4	They would be able to apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction.
CO5	
Course Code: BTES305	**Course Name:Engineering Maaterial Science**
CO'S	**After completion of the course students will be able to**
CO1	Student will be able to define and describe about certain parameter related to electrical conducting materials ,basics of crystal structure. predict the behavior of the material and the application of that materials
CO2	Student will be able to summarize about polarization in dielectric material, define parameters related to dielectric material, discuss frequency and temperature dependence of material and state the application of this materials.
CO3	Student will be able to explain the properties of semiconductor and fermi level in semiconductor , classify engineering materials and their properties and applications
CO4	Student will be able to identify different factor affecting magnetic behavior, classify magnetic material and to interpret the application of magnetic material.
CO5	Student will be able to describe about galvanization and impregnation process, ndt test, derive the bragg's law.
Course Code: BTEEL306	**Course Name:Electrical Machine -I Lab**
CO'S	**After completion of the course students will be able to**
CO1	The construction and working ,also the parameters involved and types of single phase transformer
CO2	The construction and different connection of three phase transformer and also about the parallel operation and test carried out on three phase transformer
CO3	Detailed explanation about the construction , armature reaction , characteristics and mmf of dc generator
CO4	Explain operational behavior , characteristics , application and test carried out on dc motor

se Code: BTEEL307	Course Name: Electrical & Electronics Measuremen
CO'S	**After completion of the course students will be able to**
CO1	To find different parameter of electrical quantities by using bride circuit
CO2	To find different parameter of electrical quantities by using bride circuit
CO3	Explain working and principles of digital measuring devices
CO4	Explain working and principles of digital measuring devices
CO5	Describe transducer also explain about displyas and recorders

Course Code: BTEEP308	**Course Name:Mini Project-I**
CO'S	**After completion of the course students will be able to**
CO1	Identify and formulate technical problem
CO2	Solve the identified problem by applying the prerequiste knowledge
CO3	Work as an individual or in a team in the development of project
CO4	Write the mini project report with a logical and systematic approach
CO5	Communicate/ present the project work in front of the peer group

Second Year(SEM-IV)

Course Code: BTEEC401	**Course Name:Network Theory**
CO'S	**After completion of the course students will be able to**
CO1	Explain basic concepts of active & passive ciecuit with the help of circuit diagram.
CO2	Calculate current & voltage of various circuit by using different network theorems & graph theory.
CO3	Solve the numerical by using transient response analysis in network circuit.
CO4	Apply laplace's transform to R-L, R-C and R-L-C circuits for finding the response along with applying transient and steady state response of RL.
CO5	Solve the numerical using different filters of sinusoidal steady state ac circuit for finding various parameter.

Course Code: BTEEC402	**Course Name:Power System**
CO'S	**After completion of the course students will be able to**
CO1	Explain construction and working of conventional power plants and major equipment of in generating station

CO2	Design electrically the over head transmission lines considering various transmission losses
CO3	Design mechanically the transmission lines considering various conductors and insulators. Calculate sag due to equal and unequal supports with their derivation
CO4	Evaluate the performance of transmission lines. Analyzing various transmission lines like short, medium and long transmission line
CO5	Calculate AC and DC distribution considering three phase unbalanced load, four wire unbalanced star connected load, ground detector
Course Code: BTEEC403	**Course Name:Electrical Machines-II**
CO'S	**After completion of the course students will be able to**
CO1	Recall the classification of a.c machines and also explain the constructional features and operation of A.C. machines
CO2	Define about winding factors and derive emf equations , and predict the causes and suppression of harmonics
CO3	Describe detailed information about synchronous machines and also explain about parallel operation of generators, synchronization synchronous condenser.
CO4	Describe and solve problems regrading the induction motors , discuss about different test and starting methods .
CO5	Describe and solve problems regrading single phase induction motor.
CO6	Explain about some of the special machines
Course Code: BTBS404	**Course Name:Analog & Digital Electronics**
CO'S	**After completion of the course students will be able to**
CO1	To understand the amplifiers & its type
CO2	To understand deign and characteristics of operational amplifier& its types
CO3	To study different types of number system & their conversion
CO4	To study ttl logic families, flip flops, digital logic gate characteristics
CO5	To understand & draw k-map & different minimization techniques
CO6	To design combination systems, decoders & encoders
se Code: BTEEPE405C	**Course Name:Advance Renewable Energy So**
CO'S	**After completion of the course students will be able to**
CO1	Create awareness among the students about different types of non conventional energy sources

CO2	Introduce about wind energy power plant
CO3	Introduce with photo voltaic power plant and various applications of that
CO4	Introduce students about biomass energy derived from organic matter
CO5	Understand different types of storage systems used for renewable energy power plant
Course Code: BTEEL406	**Course Name:Network Theory Lab**
CO'S	**After completion of the course students will be able to**
CO1	Explain basic concepts of active & passive ciecuit with the help of circuit diagram.
CO2	Calculate current & voltage of various circuit by using different network theorems & graph theory.
CO3	Solve the numerical by using transient response analysis in network circuit.
CO4	Apply laplace's transform to R-L, R-C and R-L-C circuits for finding the response along with applying transient and steady state response of rl.
CO5	Solve the numerical using different filters of sinusoidal steady state ac circuit for finding various parameter.
Course Code: BTEEL407	**Course Name:Power System Lab**
CO'S	**After completion of the course students will be able to**
CO1	The layout of thermal power plant, hydro power plant and alternator excitation system.
CO2	The types and properties of various overhead insulators and overhead conductors.
CO3	The power cable and its various components and types.
CO4	Layout of substation along with its components
CO5	Determine the ABCD parameters of a medium and long transmission line.
Course Code: BTEEL408	**Course Name:Electrical Machine-II Lab**
CO'S	**After completion of the course students will be able to**
CO1	Describe detailed information about synchronous machines and also explain about parallel operation of generators, synchronization synchronous condenser
CO2	Describe and solve problems regrading the induction motors , discuss about different test and starting methods .
Course Code: BTEEL409	**Course Name:Analog & Digital Electronics Lab**
CO'S	**After completion of the course students will be able to**

CO1	Understand the amplifiers & its type
CO2	Understand deign and characteristics of operational amplifier& its types
CO3	Study different types of number system & their conversion
CO4	Study ttl logic families, flip flops, digital logic gate characteristics
CO5	Understand & draw k-map & different minimization techniques
CO6	Design combination systems, decoders & encoders

Third Year(SEM-V)	
Course Code: BTEEC501	**Course Name:Power System Analysis**
CO'S	**After completion of the course students will be able to**
CO1	Design electrical power system when rating of generator, transformer, transmission line and different types of loads etc. are given.
CO2	Solve numerical on y-bus matrix.
CO3	Calculate current & voltage in a faulty power system under condition of symmetrical faults.
CO4	Solve the numerical for finding sequence impedance applying sequence network in symmetrical component.
CO5	Explain various activities conducted in load dispatch centre like contingency analysis, preventive and emergency control, improvement in electrical power quality, causes, affects and mitigation methods.
Course Code: BTEEC502	**Course Name:Microprocessor & Microcontroller**
CO'S	**After completion of the course students will be able to**
CO1	Describe architecture of 8085 microprocessor and simple program
CO2	Explain memory interfacing, interrupts and dma controller in 8085
CO3	Apply knowledge of interfacing to interface various external devices to 8085 microprocessor
CO4	Describe difference between microprocessor and controller and architecture of 8051 microcontroller.
CO5	Develop skill in simple program writing for microcontroller 8051
Course Code: BTEEC503	**Course Name:Power Electronics**
CO'S	**After completion of the course students will be able to**
CO1	To understand the working of basic power electronics devices
CO2	To understand phase controlled rectifier & their working
CO3	To understand the working of different kind of chopper circuit
CO4	To understand different type of inverter, types of inverter & pwm , their types
CO5	To understand ac voltage controller, their working, types & cycloconverter, their types
Course Code: BTEEPLE504	**Course Name:Group B(HVDC)**

CO'S	After completion of the course students will be able to
CO1	Explain HVDC technology, component of HVDC, configuration and MTDC system types.
CO2	Derive rectifier and inverter operations and draw equivalent circuit presentation.
CO3	Identify faults in converters and design for bypass action in bridges considering protection issue in HVDC.
CO4	Identify characteristics and uncharacteristic harmonics and apply suitable filters to reduce the harmonics and explain hybrid HVDC and off-share wind power evaluation scheme.
CO5	Analyze AC-DC system for power flow, stability, dynamic stability of AC-DC system and state applications of HVDC transmission in wind power generation.
Course Code: BTEEOE505	**Course Name:Group C(Electrical Safety)**
CO'S	**After completion of the course students will be able to**
CO1	Identify different safety kits and equipments.
CO2	Demonstrate use of grounding and bonding of electrical equipment as well as systems.
CO3	Develop Electrical safety programmer structure.
CO4	Develop Electrical safety programmer structure.
CO5	Explain information related to Regulatory bodies
Course Code: BTEEL507	**Course Name:Power System Analysis Lab**
CO'S	**After completion of the course students will be able to**
CO1	Write a program for economic dispatch in power systems using
CO2	Smulation of automatic voltage regulator using matlab.
CO3	Write a program to compute the voltage and power factor for a given system using matlab.
CO4	Study of mathematical model synchronous generator
CO5	Study of reactive power compensation
CO6	To study load flow studies using matlab
CO7	Study of transformer modelling
CO8	To study of excitation system for electrical power system

Course Code: BTEEL508	Course Name:Microprocessor & Microcontroller Lab
CO'S	**After completion of the course students will be able to**
CO1	Write and execute alp program using microprocessor
CO2	Interface different i/os with microprocessor
CO3	Execute programs in 8051 microcontroller
CO4	Build interfacing of peripherals like, i/o, a/d, d/a, etc
CO5	Understand the concepts related to i/o and memory interfacing

Course Code: BTEEL509	Course Name:Power Electronics Lab
CO'S	**After completion of the course students will be able to**
CO1	To understand the working of basic power electronics devices
CO2	To understand phase controlled rectifier & their working
CO3	To understand the working of different kind of chopper circuit
CO4	To understand different type of inverter, types of inverter & pwm , their types
CO5	To understand ac voltage controller, their working, types & cycloconverter, their types

Third Year(SEM-VI)

urse Code: BTEEC601	Course Name:Switchgear and Protect
CO'S	**After completion of the course students will be able to**
CO1	Able to list and discribe the types of circuit breakers and choice of relays for appropriateprotection of power system equipment
CO2	Summarize the various types of relay in electrical power systems
CO3	Interpret the existing transmission voltage levels and various means to protect the system against over voltages.
CO4	Explain the importance of neutral grounding, effects of ungrounded neutral grounding on system performance, methods and practices.
CO5	Interpret the protection of alternator and transformer

Course Code: BTEEC603	Course Name:Control System Engineering
CO'S	**After completion of the course students will be able to**
CO1	Classify control systems and represent in various models

CO2	Analyse the time domain responses of the linear systems.
CO3	Apply root locus and bode plot technique to assess the performance of linear systems.
CO4	Identify the needs of different types of controllers to ascertain the required dynamic respons
CO5	Examine the system behaviour using various stability analysis techniques
Course Code: BTEEPE604	**Course Name:Group D(Smart Grid Technology)**
CO'S	**After completion of the course students will be able to**
CO1	Describe smart grid technology and its component.
CO2	Illustrate architecture of smart grid design, integration tools and techniques for smart grid.
CO3	Summarize distribution generation technologies and environmental impact and climate chan
CO4	Use communication technologies for smart grid.
CO5	Demonstrate control of smart power grid system for electrical failures and cyber security rec
Course Code: BTEEOE605	**Course Name:Group E(Power Plant Engineering)**
CO'S	**After completion of the course students will be able to**
CO1	Explain about the power generation from conventional sources of energy as a fuel and also c
CO2	Remember and summarize about site selection ,elements ,plant layout and classifications of
CO3	Remember and explain detailed information of nuclear plant, diesel and gas plants.
CO4	Explain the photovoltaic effect and generation of electricity through solar plants , wind mill
CO5	Illustrate about combined power generation plant in full details and also able to provide info
ourse Code: BTEEL606	**Course Name: Switchgear and Protection La**
CO'S	**After completion of the course students will be able to**
CO1	To find different characteristics using static overcurrent relay, overvoltage relay,idmt relay a
CO2	Explain working principles of protection scheme.
CO3	Explain working and types of circuit breaks
Course Code: BTEEL608	**Course Name:Control System Engineering Lab**
CO'S	**After completion of the course students will be able to**

CO1	Demonstrate the response of first order and second order systems with various standard test signals.
CO2	Understand the concept of time domain analysis of series RLC circuit.
CO3	Understand different toolboxes in matlab and analyze various parameters of a matrix using matlab.
CO4	Analyze the stability of time invariant control system using root locus, bode plot, polar plot, nyquist criterions.
CO5	Estimate the error obtained in control system with the effect of p, pi, pid controllers.

Final Year(SEM-VII)	
Course Code: BTEEC701	**Course Name:Power System Operation & Control**
CO'S	**After completion of the course students will be able to**
CO1	To explain various techniques of reactive power & voltage control
CO2	To analyze the transient stability of power system
CO3	Tto obtain mathematical model of excitation system
CO4	To obtain mathematical model of speed governing system
CO5	To understand the economical operation of power system
Course Code:BTEEPE703A	**Course Name: Energy Conservation and Audit**
CO'S	**After completion of the course students will be able to**
CO1	Explain different sources of energy and International Agreements
CO2	Find energy inputs in industry and energy efficient design
CO3	Identify energy in non-industrial sector
CO4	Apply energy audit for systems
CO5	Find energy conservation in Utilities and Energy Investment
CO6	Energy Conservation and Audit (BTEEPE703A)
Course Code: BTEEE705	**Course Name:Elective-X**
CO'S	**After completion of the course students will be able to**
CO1	Explain economic of DC power transmission, type of DC links, major component of converter station.
CO2	Analyze gratz circuit with and without overlap and working of converter and equivalent circuit representation of HVDC link

CO3	Derive equation for current and extinction angle control and starting and stopping of HVDC link
CO4	Identify fault in converter use suitable DC circuit breaker . Considering over current and over voltage protection
CO5	Explain FACTS technology, their role, type and functionality.
CO6	Analyze the operation of static series and shunt compeseter
Final Year(SEM-VIII)	
Course Code: BTEEC602	**Course Name:Enterprenueurship Essentials**
CO'S	**After completion of the course students will be able to**
CO1	Apply the different concepts which was given by dhirubai ambani for becoming a successfull businessman
CO2	Apply the entrapreunership qualities
CO3	Apply and act during competition to take avantage to the most
CO4	Apply the marketting concepts in real time world
CO5	Calculate the financial statements every year
CO6	Execute the predetermined business plan
CO7	Take the advantage of government incentives for entrapreunership
CO8	Analyze the break even analysis by applying statistics
CO9	Apply innovation
CO10	Apply the concepts of funding etc
CO11	Apply the do and donts practice in start up company
CO12	Apply the human resource management
Course Code: BTEEP803	**Course Name:Poject-II**
CO'S	**After completion of the course students will be able to**

CO1	Understand the basic concepts & broad principles of industrial projects
CO2	Understand concepts of project and project management
CO3	Apply the theoretical concepts to solve industrial problems with teamwork and multidiscip
CO4	Implement project planning in various stages of project cycle
CO5	Demonstrate professionalism with ethics; present effective communication skills and relate engineering issues to broader societal context