2.6.1 – COURSE OUTCOMES FOR ALL COURSES

Program: Electronics Engineering

Academic Year: 2018-2019

Semester: III

Course: Engineering Mathematics -III

Course Code: BTBSC301 Credits: 4

L:P:T:S: 3:1:0:0 CIE Marks(MSE+CA+ESE): 100

Exam Hours: 3 Total Theory Hours: 35

ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	Solve higher order linear differential equation using appropriate techniques for modeling and analyzing electrical circuits.
CO2	Solve problems related to Fourier transform, Laplace transform and applications to Communication systems and Signal processing.
CO3	Obtain Interpolating polynomials, numerically differentiate and integrate functions, numerical solutions of differential equations using single step and multi-step iterative methods used in modern scientific computing.
CO4	Perform vector differentiation and integration, analyze the vector fields and apply to Electromagnetic fields.

Course: Analog Circuits

Course Code: BTEXC302 Credits: 3

L:P:T:S: 2:2:1 CIE Marks(MSE+CA1+ESE): 100

Exam Hours: 3 Total Theory Hours: 35

ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	Understand the characteristics of IC and Op-Amp and identify the internal structure
CO2	Derive and determine various performances based parameters and their significance for Op-Amp.
CO3	Comply and verify parameters after exciting IC by any stated method.

Course: Electronics Devices & Circuits

Course Code: BTEXC303 Credits: 3

L:P:T:S: 2:2:1 CIE Marks(MSE+CA1+ESE): 100

Exam Hours: 3 Total Theory Hours: 35

ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	Comply and verify parameters after exciting devices by any stated method.
CO2	Implement circuit and test the performance.
CO3	Analyze BJT, JFET and MOSFET for various applications

Course: Network Analysis

Course Code: BTEXC304 Credits: 3

L:P:T:S: 2:2:1 CIE Marks(MSE+CA1): 40

Exam Hours: 3 Total Theory Hours: 35

ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	To learn about the basic laws of electric circuits as well as the key fundamentals of the communication channels, namely transmission lines.
CO2	To understand the need of simplification techniques of complicated circuits
CO3	To learn about the comprehensive insight into the principle techniques available for characterizing circuits, networks and their implementation in practice.

Course: Digital Logic Design

Course Code: BTEXC305 Credits: 3

L:P:T:S: 2:2:1 CIE Marks(MSE+CA1): 40

Exam Hours: 3 Total Theory Hours: 35

ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	Use the basic logic gates and various reduction techniques of digital logic circuit in detail.

CO2	Design combinational and sequential circuits.
CO3	Understand the architecture and use of VHDL for basic operations and Simulate using simulation software.

Course: Basic Human Rights

Course Code: BTHM3401 Credits: Audit

L:P:T:S: 2:0:0 CIE Marks(CA): 50

Exam Hours: 0 Total Theory Hours: 35

ESE Marks: 0

Course Outcomes: At the end of the course, student will be able to:

CO1	Simply put, human rights education is all learning that develops the knowledge, skills, and values of human rights.
CO2	Strengthen the respect for human rights and fundamental freedoms.

Semester: IV

Course: Electrical Machines & Instruments

Course Code: BTESC401 Credits: 3

L:P:T:S: 2:1:2:0 CIE Marks(MSE+CA): 40

Exam Hours: 3 Total Theory Hours: 35

ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	The ability to formulate and then analyze the working of any electrical machine using mathematical model under loaded and unloaded conditions.
CO2	The ability to troubleshoot the operation of an electrical machine.
CO3	The ability to select a suitable measuring instrument for a given application.
CO4	The ability to estimate and correct deviations in measurements due to the influence of the instrument and due to the accuracy of the instrument.

Course: Analog Communication Engineering

Course Code: BTEXC402 Credits: 3

L:P:T:S: 2:2:1:0 CIE Marks(MSE+CA): 40

Exam Hours: 3 Total Theory Hours: 35

ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	Understand and identify the fundamental concepts and various components of analog communication systems.
CO2	Understand the concepts of modulation and demodulation techniques.
CO3	Design circuits to generate modulated and demodulated wave.

Course: Microprocessor

Course Code: BTEXC403 Credits: 3

L:P:T:S: 2:2:1:0 CIE Marks(MSE+CA): 40

Exam Hours: 3 Total Theory Hours: 35

ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	Learner gains ability to apply knowledge of engineering in designing different case studies.
CO2	Students get ability to conduct experiments based on interfacing of devices to or interfacing to real world applications.
CO3	Students get ability to interface mechanical system to function in multidisciplinary system like in robotics, Automobiles.

Course: Signals & Systems

Course Code: BTEXC404 Credits: 3

L:P:T:S: 2:2:1:0 CIE Marks(MSE+CA): 40

Exam Hours: 3 Total Theory Hours: 35

ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	Understand mathematical description and representation of continuous and discrete time signals and systems.

CO2	Develop input output relationship for linear shift invariant system and understand the convolution operator for continuous and discrete time system.
CO3	Understand and resolve the signals in frequency domain using Fourier series and Fourier transforms.

Course: Numerical Methods & Computer Programming

Course Code: BTBSC405 Credits: 3

L:P:T:S: 2:2:1:0 CIE Marks(MSE+CA): 40

Exam Hours: 3 Total Theory Hours: 35

ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	Able to solve algebraic and transcendental equations by using numerical techniques and will be able to compare different numerical techniques used for this purpose and also will be able to choose a proper one as per the requirement of the problem.
CO2	Able to solve a system of linear equations with any number of variables using different direct and iterative numerical techniques.
CO3	Understand the concept of interpolation, finite difference operators and their relations, and can apply different interpolation techniques on equi-spaced or non equi-spaced data values.

Semester: V

Course: Data Structure & Algorithms

Course Code: BTEXC501 Credits:3

L:P:T:S: 4:2:0:0 CIE Marks (MSE+ESE+LAB): 200

Exam Hours: 3 Total Theory Hours: 35

ESE Marks :100

At the end of this course students will demonstrate the ability to

1. Understand characteristics and wave propagation on high frequency transmission lines
2. Carryout impedance transformation on TL
3. Use sections of transmission line sections for realizing circuit elements

4. Characterize uniform plane wave

5. Calculate reflection and transmission of waves at media interface

6. Analyze wave propagation on metallic waveguides in modal form

7. Understand principle of radiation and radiation characteristics of an antenna

Course: Digital Signal Processing

Course Code: ECT302	Credits :3
L:P:T:S: 4:2:0:0	CIE Marks (MSE+ESE+LAB): 200
Exam Hours: 3	Total Theory Hours: 35
ESE Marks :100	

Course Outcomes:

After the completion of the course the student will be able to :

1 Illustrate digital signals, systems and their significance.

2 Analyse the digital signals using various digital transforms DFT, FFT etc.

3 Design and develop the basic digital system.

4 Interpret the finite word length effects on functioning of digital filters.

Course: Control Systems

Course Code: ECT303	Credits :3
L:P:T:S: 4:2:0:0	CIE Marks (MSE+ESE+LAB): 200
Exam Hours: 3	Total Theory Hours: 35
ESE Marks :100	

Course Outcomes:

At the end of the course, a student will be able to:

1. Categorize different types of system and identify a set of algebraic equations to represent and model a complicated system into a more simplified form.

2. Characterize any system in Laplace domain to illustrate different specification of the system using transfer function concept.

3. Interpret different physical and mechanical systems in terms of electrical system to construct equivalent electrical models for analysis.

4. Employ time domain analysis to predict and diagnose transient performance parameters of the system for standard input functions.
5. Formulate different types of analysis in frequency domain to explain the nature of stability of the system.

Course: Embedded System Design

Course Code: ECT305 Credits :3
L:P:T:S: 4:2:0:0 CIE Marks (MSE+ESE+LAB): 200
Exam Hours: 3 Total Theory Hours: 35
ESE Marks :100

Course Outcomes (COs)
1 .Acquire a basic knowledge about fundamentals of microcontrollers.
2. Acquire a basic knowledge about programming and system control to perform a specific task.
3.Acquire knowledge about devices and buses used in embedded networking
4.Develop programming skills in embedded systems for various applications.
5. Acquire knowledge about basic concepts of circuit emulators.
6. Acquire knowledge about Life cycle of embedded design and its testing

Course: Mini Project I

Course Code: ECT311
L:P:T:S: 4:2:0:0 CIE Marks(CE): 60
Exam Hours: 3 Total Theory Hours: 0
ESE Marks:100

Course Contents:
1. Mini project may be carried out in one or more form of following:
2. Product preparations, working/non-working models, prototype development, fabrication of setups, laboratory experiment development, process modification/development, simulation,

3. Software development, integration of software and hardware, statistical data analysis, survey, creating awareness in society.

4. The student is required to submit a report based on the work. The evaluation of the project shall be on continuous basis.

Semester: VI

Course: Digital Communication Systems

Course Code: ECT312 Credits:3

L:P:T:S: 4:2:0:0 CIE Marks (MSE+ESE+LAB): 200

Exam Hours: 3 Total Theory Hours: 35

ESE Marks :100

Course Outcomes:

On completion of the course, student will be able to

1) Understand working of waveform coding techniques and analyse their performance.

2) Analyze the performance of a baseband and pass band digital communication system in terms of error rate and spectral efficiency.

3) Perform the time and frequency domain analysis of the signals in a digital communication system.

4) Design of digital communication system.

5) Understand working of spread spectrum communication system and analyze its performance.

Course: Digital Systems Design using HDL

Course Code: ECT313 Credits: 3

L: P: T: S: 4:2:0:0 CIE Marks (MSE+ESE+LAB): 200

Exam Hours: 3 Total Theory Hours: 35

ESE Marks: 100

1. Demonstrate the use and application of Boolean algebra in reduction, expansion, factoring

2. Use commercially available VHDL software to analyze and synthesize digital circuits.

3. Be able to simulate and debug digital systems described in VHDL (to synthesize complex digital circuits at several level of abstractions).

4. To implement logic on an FPGA and a CPLD

Course: Electromagnetic Engineering

Course Code: ECT314 Credits:3

L:P:T:S: 4:0:0:0 CIE Marks (MSE+ESE): 100

Exam Hours: 3 Total Theory Hours: 35

ESE Marks :100

Course Outcomes

After study through lectures and assignments, students will be able to:

1. Apply vector calculus to static electric-magnetic fields in different engineering situations.
2. Analyze Maxwell's equation in different forms (differential and integral) and apply them to diverse engineering problems.
3. Examine the phenomena of wave propagation in different media and its interfaces and in applications of microwave engineering.
4. Analyze the nature of electromagnetic wave propagation in guided medium which are used in microwave applications.

Course: Power Electronics

Course Code: ECT315 Credits:3

L:P:T:S: 4:2:0:0 CIE Marks (MSE+ESE+LAB): 200

Exam Hours: 3 Total Theory Hours: 35

ESE Marks : 100

Course Outcomes:

At the end of the course, a student will be able to:

1. Relate basic semiconductor physics to properties of power devices, and combine circuit mathematics and characteristics of linear and non-linear devices.
2. Describe basic operation and compare performance of various power semiconductor devices, passive components and switching circuits
3. Design and Analyze power converter circuits and learn to select suitable power electronic

devices by assessing the requirements of application fields.

4. Formulate and analyze a power electronic design at the system level and assess the performance.

5. Identify the critical areas in application levels and derive typical alternative solutions, select suitable power converters to control Electrical Motors and other industry grade apparatus.

6. Recognize the role power electronics play in the improvement of energy usage efficiency and the applications of power electronics in emerging areas.

Course: Electronic Instruments & Measurement

Course Code: ECT316 Credits:3

L:P:T:S: 4:2:0:0 CIE Marks(MSE+ESE+LAB): 200

Exam Hours: 3 Total Theory Hours: 35

ESE Marks : 100

After completion of this course, students will be able to –

1.Identify different measuring instruments for the measurement of various electrical and non-electrical parameters.

2.Select various transducers for the measurement of physical quantities like temperature, pressure, distance and displacement.

3.Compute the errors present in measuring instruments and calibrate them.

4.Examine AC bridges for the measurement of inductance, capacitance and frequency.

5.Analyze the characteristics of Solar panel, earth resistance and temperature transducers.

Course: Mini Project- II

Course Code: ECT322 Credits: 4

L:P:T:S: 4:0:0:0 CIE Marks(CE): 100

Exam Hours: 0 Total Theory Hours: 0

ESE Marks : 100

Course Contents:

1. Mini project may be carried out in one or more form of following:

2. Product preparations, working/non-working models, prototype development, fabrication of setups, laboratory experiment development, process modification/development, simulation,

3. Software development, integration of software and hardware, statistical data analysis, survey, creating awareness in society.

4. The student is required to submit a report based on the work. The evaluation of the project shall be on continuous basis.

Semester: VII

Course: Digital VLSI

Course Code: ECN401 Credits:4

L:P:T:S: 4:2:0:0 CIE Marks (TEST+PAPER+LAB): 200

Exam Hours: 3 Total Theory Hours: 35

ESE Marks :100

Identify the various IC fabrication methods.

1. Express the Layout of simple MOS circuit using Lambda based design rules.
2. Apply the Lambda based design rules for subsystem design
3. Differentiate various FPGA architectures.
4. Design an application using Verilog HDL.
5. Concepts of modeling a digital system using Hardware Description Language.

Course: RF antenna & Micriwave Engineering

Course Code: ECN402 Credits:4

L:P:T:S: 4:2:0:0 CIE Marks (TEST+PAPER+LAB): 200

Exam Hours: 3 Total Theory Hours: 35

ESE Marks :100

Course Outcomes

1. Understanding working concepts of RF active components.
2. Designing of various Microwave Solid State Devices.
3. Analysis of various microwave devices.

Course: (Wireless & Mobile Communication)Elective-II

Course Code: ECN407 Credits:4

L:P:T:S: 4:0:0:0 CIE Marks (TEST+PAPER): 100

Exam Hours: 3 Total Theory Hours: 35

ESE Marks: 100

The students shall have the understanding of basics of Wireless communication.

1. The students will be able to understand the cellular concept, Co-channel Interference and frequency Reuse concept
2. Upon completion of the course, the students shall have the ability to understand the concept of fading and Diversity and design some model to reduce these effects.
3. Upon completion of the course, the students shall have the ability to understand the concept of multiple access techniques and the cellular systems which are using these techniques.
4. Students shall be able to understand various wireless systems and standards GSM,CDMA,UMTS,4G,LTE

Semester: VIII

Course: Computer Network

Course Code: ECN415 Credits:4

L:P:T:S: 4:2:0:0 CIE Marks (TEST+PAPER+LAB): 200

Exam Hours: 3 Total Theory Hours: 35

ESE Marks: 100

1. Demonstrate an understanding of optical fiber communication link, structure, propagation and transmission properties of an optical fiber. Estimate the losses and analyze the propagation characteristics of an optical signal in different types of fibers
2. Describe the principles of optical sources and power launching-coupling methods.
3. Compare the characteristics of fiber optic receivers
4. Design a fiber optic link based on budgets
5. To assess the different techniques to improve the capacity of the system.

Course: Optical Fiber Communication

Course Code: ECN416 Credits:4

L:P:T:S: 4:2:0:0 CIE Marks (TEST+PAPER+LAB): 200

Exam Hours: 3 Total Theory Hours: 35

ESE Marks: 100

1. Demonstrate an understanding of optical fiber communication link, structure, propagation and transmission properties of an optical fiber. Estimate the losses and analyze the propagation characteristics of an optical signal in different types of fibers
2. Describe the principles of optical sources and power launching-coupling methods.
3. Compare the characteristics of fiber optic receivers
4. Design a fiber optic link based on budgets
5. To assess the different techniques to improve the capacity of the system

Academic Year: 2019-2020

Semester: III

Course: Mathematics- III

Course Code: BTBSC301 Credits: 4
L:P:T:S: 3:0:1:0 CIE Marks(MSE+CA1+CA2): 40
Exam Hours: Total Theory Hours: 38
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	Formulate and solve mathematical models of civil engg. Phenomena in field of structure, survey, fluid mechanics and soil mechanics.

Course: MECHANICS OF SOLIDS

Course Code: BTCVES302 Credits: 4
L:P:T:S:- 3:0:1:0 CIE Marks(MSE+CA1+CA2): 40
Exam Hours: Total Theory Hours: 48
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	Perform the stress -strain analysis.
CO2	Draw force distribution diagram for members and determinate beams.
CO3	Visualize force deformation behavior of bodies.
CO4	Perform failure analysis

Course: HYDRAULICS- I

Course Code: BTCVC303 Credits: 3
L:P:T:S:- 2:1:1:0 CIE Marks(MSE+CA1+CA2): 40
Exam Hours: Total Theory Hours: 36
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	Calibrate the various flow measuring devices.
CO2	Determine the properties of the fluid and pressure and their measurement.
CO3	Understand fundamentals of pipe flow, losses in pipe and analysis of pipe network.
CO4	Visualize fluid flow phenomena observed in civil engg. System.

Course: SURVEYING

Course Code: BTCVCS304 Credits: 3
L:P:T:S:- 2:1:1:0 CIE Marks(MSE+CA1+CA2): 40
Exam Hours: Total Theory Hours: 36
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	Perform measurements in linear/ angular methods.
CO2	Perform plane table surveying in genral terrain.
CO3	Know the basics of levelling and Theodolite survey in elevation and angular measurements.

Course: Building Construction

Course Code: BTCVC305 Credits: 2
L:P:T:S:- 2:1:0:0 CIE Marks (MSE+CA1+CA2): 40
Exam Hours: Total Theory Hours: 35
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	CO1: Understand types of masonry structures.
CO2	Understand composition of concrete and effect of various parameters affecting strength.
CO3	Comprehend components of building and there purposes
CO4	Comprehend the precast and pre-engineered building construction techniques.

Course: Engineering Geology

Course Code: BTCVC306 Credits: 3
L:P:T:S:- 2:1:0:0 CIE Marks(MSE+CA1+CA2): 40
Exam Hours: Total Theory Hours: 37
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	Recognize the different land forms which are formed by various geological agents.
CO2	Identify the origin , texture and structure of various rocks and physical properties of minerals.
CO3	Emphasize distinct geological structures which have influence on the civil engineering structures.
CO4	Understand how the various geological conditions affect the design parameters of structures.

Course: Soft Skill Development

Course Code: BTHM303 Credits: 2
L:P:T:S:- 2:0:0:0 CIE Marks(CA1+CA2): 50
Exam Hours: Total Theory Hours: 12

Program Educational Outcomes

1) Learners will acquire interpersonal communication skills.
2) Learners will develop the ability to work independently.
3) Learners will develop the qualities like self-discipline, self-criticism and self-management.
4) Learners will have the qualities of time management and discipline.
5) Learners would be able to present themselves as an inspiration for other

Course: BTCVL307 Hydraulic Engineering Laboratory I
Practical: 2 hours / week

Course: BTCVL308 Surveying Laboratory – I
Practical:2 hours / week
Course Outcomes: On completion of the course, the students will be able to:
CO1: Use the theodolite along with chain/tape, compass on the field.
CO2: Apply geometric and trigonometric principles of basic surveying calculations.
CO3: Plan a survey, taking accurate measurements, field booking, and adjustment of errors.
CO4: Apply field procedures in basic types of surveys, as part of a surveying team.
CO5: Employ drawing techniques in the development of a topographic map

Course: BTCVL309Building Construction - Drawings Laboratory
Practical:2 hours / week
Course Outcomes :On completion of the course, the students will be able to:
CO1: Draw plan, elevation and section of various structures.
CO2: Apply the principles of planning and by laws used for building planning.
CO3: Prepare detailed working drawing for doors and windows

Course: BTCVL310 Engineering Geology Laboratory
Practical:2 hours / week
Course Outcomes :On completion of the course, the students will be able to:
CO1: Calculate the linear measurement on surface.
CO2: Find out engineering properties of various geological materials
CO3: Draw subsurface lithologs.
CO4: Identify minerals and rocks by studying physical properties

BTCVS311Seminar on Topic of Field Visit to Foundation Work
Student shall visit to ongoing construction sites in field to witness and collect necessary information from works of foundation execution. It is desirable to collect basic information of geotechnical aspects of foundations, types and components of foundations, tools and plants, construction machinery, etc. Intention is to introduce students to process of collection and presentation of technical information. Report shall be submitted to cover above aspects as studied.

BTCVF312Field Training (from semester II)
Student shall undergo field training / industrial training / internship during summer vacation after Semester II. This training is at elementary level expecting exposure to field practices. A brief report shall be submitted. Evaluation shall be based on report and power point presentation

Semester: IV

Course: HYDRAULICS- II

Course Code: BTCVC401 Credits: 3
L:P:T:S:- 2:1:2:0 CIE Marks(MSE+CA1+CA2): 40
Exam Hours: Total Theory Hours: 38
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	Design open channel section in a most economical way.
CO2	Know about the non- uniform flows in open channel and characteristics of hydraulic jump.
CO3	Understand application of momentum principle of impact of jets on plane.

Course: SURVEYING-II

Course Code: BTCVCS402 Credits: 3
L:P:T:S:- 2:1:1:0 CIE Marks(MSE+CA1+CA2): 40
Exam Hours: Total Theory Hours: 38
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	Understand basics different types of curves on roads and their preliminary survey.
CO2	Perform setting of curves, buildings, culverts and tunnels
CO3	Comprehend different geodetic methods of survey such as triangulation, trigonometric leveling.
CO4	Comprehend modern advanced surveying techniques

Course: STRUCTURAL MECHANICS

Course Code: BTCVC403 Credits: 4
L:P:T:S:- 3:0:1:0 CIE Marks(MSE+CA1+CA2): 40
Exam Hours: Total Theory Hours: 37
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	Describe the concept of structural analysis, degree of indeterminacy.
CO2	Calculate slopes and deflection at various locations for different types of beams
CO3	Identify determinate and indeterminate trusses and calculate forces in the members of trusses Perform the distribution of the moments the in continuous beam and frame

Course: Product Design Engineering

Course Code: BTID405 Credits: 3
L:P:T:S:- 1:0:2:0 CIE Marks(MSE+CA1+CA2): 40
Exam Hours: Total Theory Hours: 8
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	Create simple design and components or a system as a whole.
CO2	Create design documents for knowledge sharing.
CO3	Manage own work to meet design requirements
CO4	Work effectively in a team

Course: Numerical Methods in Engineering

Course Code : BTCVE404A Credits: 3

L:P:T: S:- 3:0:0:0 CIE Marks(MSE+CA1+CA2): 40

Exam Hours: Total Theory Hours: 32

ESE Marks: 60

Course: Planning for Sustainable Development

Course Code : BTCVE404B Credits: 3

L:P:T: S:- 3:0:0:0 CIE Marks(MSE+CA1+CA2): 40

Exam Hours: Total Theory Hours: 28

ESE Marks: 60

Course: Engineering Management

Course Code: BTCVC406 Credits: AU

L:P:T:S:- 1:0:0:0 CIE Marks(CA):50

Exam Hours: Total Theory Hours: 14

ESE Marks:

Course Outcomes: At the end of the course, student will be able to:

CO1	Demonstrate the nuances of management functions business situations.
CO2	Analyze the framework of a business organization.
CO3	Adopt an empirical approach toward
CO4	Apply various Management techniques

Course: Basic Human Rights

Course Code: BTHM3401 Credits: AU

L:P:T:S:- 2:0:0:0 CIE Marks(CA):50

Exam Hours: Total Theory Hours: 24

ESE Marks:

Course: BTCVL307 Hydraulic Engineering Laboratory II

Practical: 2 hours / week

Course Outcomes: At the end of the course, student will be able to:

CO1	Understand various properties of fluids and measurement techniques.
CO2	Carry out calibrations of various flow measuring devices.
CO3	Understand mechanism of hydraulic jump, various jets and pumps.

Course: BTCVL407 Hydraulic Engineering Laboratory II

Practical: 2 hours / week

Course Outcomes: At the end of the course, student will be able to:

CO1	Determine contour level of field.
CO2	Determine the tachometric constants and grade of a line
CO3	Use sub tense bar for distance measurement.

Course: BTCVL409 Solid Mechanics Laboratory

Practical: 2 hours / week

Course Outcomes: At the end of the course, student will be able to:

CO1	Evaluate Young Modulus, torsional strength, hardness and tensile strength of given specimens.
CO2	Determine the strength of coarse aggregates. Find the compressive strength of concrete cubes and bricks.
CO3	Determine physical properties of given coarse aggregates, fine aggregates and cement sample

BTCVM410 Mini Project

Practical: 2 hours / week

Students shall take up work leading to product development. Needs of community around may be of prime concern. Work may target at easing out conventional construction operation by improvement of traditional devices / tools or development of altogether new approach.

BTCVF411 Seminar on Topic of Field Visit to works involving Superstructure Construction

Student shall visit to ongoing construction sites in field to witness and collect necessary information from works of execution of superstructure of buildings or other. It is desirable to collect basic information on components of superstructure, tools and plants, construction machinery, etc. Intention of the work is to introduce the student to the chronological order of execution of works and generate data on vocabulary of terms in field.

Semester: V

Course: Design of Steel Structure

Course Code: BTCVC501 Credits: 4
L:P:T:S:- 2:0:2:0 CIE Marks(MSE+CA1+CA2): 40
Exam Hours: Total Theory Hours: 38
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	Identify and compute the design loads and the stresses developed in the steel member..
CO2	Analyze and design the various connections and identify the potential failure modes.
CO3	Analyze and design various tension, compression and flexural members.
CO4	Understand provisions in relevant BIS Codes

Course: Structural Mechanics-II

Course Code: BTCVC502 Credits: 3
L:P:T:S:- 2:0:1:0 CIE Marks(MSE+CA1+CA2): 40
Exam Hours: Total Theory Hours: 36
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	Have a basic understanding of matrix method of analysis and will be able to analyze the determinant structure.
CO2	Have a basic understanding of the principles and concepts related to finite difference and finite element methods.
CO3	Have a basic understanding of concept of influence line .

Course: Soil Mechanics

Course Code: BTCVC503 Credits: 4
L:P:T:S:- 3:2:1:0 CIE Marks(MSE+CA1+CA2): 40
Exam Hours: Total Theory Hours: 39
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	Understand different soil properties and behavior
CO2	Understand stresses in soil and permeability and seepage aspects.
CO3	Develop ability to take up soil design of various foundations

Course: Environmental Engineering

Course Code: BTCVC504 Credits: 2
L:P:T:S:- 2:0:2:0 CIE Marks(MSE+CA1+CA2): 40
Exam Hours: Total Theory Hours: 26
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	Apply the water treatment concept and methods.
CO2	Prepare basic process designs of water and wastewater treatment plants.
CO3	Apply the wastewater treatment concept and methods
CO4	Apply the solid waste management concepts

Course: Transportation Engineering

Course Code: BTCVC505 Credits: 2
L:P:T:S:- 2:0:2:0 CIE Marks(MSE+CA1+CA2): 40
Exam Hours: Total Theory Hours: 30
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	Comprehend various types of transportation systems and their history of the development
CO2	Comprehend to various types of pavements
CO3	Design the pavements by considering various aspects associated with traffic safety measures
CO4	

Course: Essence of Indian Traditional Knowledge

Course Code: BTHM3507 Credits: 1
L:P:T:S:- 1:0:0:0 CIE Marks(CA1+CA2): 50
Exam Hours: Total Theory Hours: 12
ESE Marks:

Course :**BTCVE506A Materials, Testing &Evaluation:**

Course Code: BTCVE506A Credits: 3
L:P:T:S:- 3:0:0:0 CIE Marks(MSE+CA1+CA2): 40
Exam Hours: Total Theory Hours: 36
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	To develop skill among students to construct strong and durable structures by applying knowledge of material science.
CO2	To make the students aware of quality assurance and control in their real life as a professional.

Course: **Development Engineering**

Course Code: BTCVE506C Credits: 3
L:P:T:S:- 3:0:0:0 CIE Marks(MSE+CA1+CA2): 40
Exam Hours: Total Theory Hours: 36
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	To develop multi scaled perspective about decisions in the built environment, 2
CO2	To expose the students to the analysis and evaluation of real world problems aiming to bring desired change in the society.

Course : Business Communication & Presentation Skills

Course Code: BTCVE506D Credits: 3
L:P:T:S:- 3:0:0:0 CIE Marks(MSE+CA1+CA2): 40
Exam Hours: Total Theory Hours: 36
ESE Marks: 60

Course: BTCVL508 Soil Mechanics Laboratory

Practical: 2 hours / week

Course Outcomes: At the end of the course, student will be able to:

CO1	Determine different engineering properties of soil
CO2	Identify and classify soils based on standard geotechnical engineering practices.
CO3	Perform Laboratory oratory compaction and in-place density tests.
CO4	Perform and interpret direct shear tests and estimate shear strength parameters

Course: BTCVL509 Environmental Engineering Laboratory

Practical: 2 hours / week

Course Outcomes: At the end of the course, student will be able to:

CO1	Quantify the pollutant concentration in water, wastewater and ambient air.
CO2	Recommend the degree of treatment required for the water and wastewater.
CO3	Analyze the survival conditions for the microorganism and its growth rate.
CO4	

Course BTCVL510 Transportation Engineering Laboratory

Practical: 2 hours / week

Course Outcomes: At the end of the course, student will be able to:

CO1	Perform tests on various road construction materials.
CO2	Perform CBR tests on local soils to determine subgrade properties needed for roadways.

BTCVF511Seminar on Topic of Field Visit to works related to Building Services

Student shall visit to ongoing construction sites in field to witness and collect necessary information from works of execution of building services such as electrification, plumbing, air-conditioning, acoustics, etc. It is desirable to collect basic information on components, tools and plants, construction equipment, safety precautions, etc. Intention of the work is to introduce the student to the chronological order of execution of works and generate data on vocabulary of terms in field.

Semester: VI

Course: Design of Concrete Structures -I

Course Code: BTCVC601 Credits: 3

L:P:T:S:- 3:0:1:0 CIE Marks(MSE+CA1+CA2): 40

Exam Hours: Total Theory Hours: 33

ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	Comprehend to the various design philosophies used for design of reinforced concrete.
CO2	Analyze and design the reinforced concrete slab using limit state and working state method.
CO3	Analyze and design the reinforced concrete beam using limit state and working state method.
CO4	Analyze and design the reinforced concrete column using limit state and working state method

Course: Foundation Engineering

Course Code: BTCVC602 Credits: 3

L:P:T:S:- 3:0:1:0 CIE Marks(MSE+CA1+CA2): 40

Exam Hours: Total Theory Hours: 36

ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	To predict soil behavior under the application of loads and come up with appropriate solutions to foundation design queries.
CO2	Analyze the stability of slope by theoretical and graphical methods
CO3	Analyze the results of in-situ tests and transform measurements and associated uncertainties into relevant design parameters.
CO4	Synthesize the concepts of allowable stress design, appropriate factors of safety, margin of safety, and reliability

Course: Concrete Technology

Course Code: BTCVC603 Credits: 2

L:P:T:S:- 2:2:0:0 CIE Marks(MSE+CA1+CA2): 40

Exam Hours: Total Theory Hours: 25

ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	Understand the various types and properties of ingredients of concrete.
CO2	Understand effect of admixtures on the behavior of the fresh and hardened concrete.
CO3	Formulate concrete design mix for various grades of concrete
CO4	

Course: Project Management

Course Code: BTCVC604 Credits: 2

L:P:T:S:- 2:0:1:0 CIE Marks(MSE+CA1+CA2): 40

Exam Hours: Total Theory Hours: 29

ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	Understand various steps in project Management, different types of charts
CO2	. Construct network by using CPM and PERT method.
CO3	Determine the optimum duration of project with the help of various time estimates.
CO4	Know the concept of engineering economics, economic comparisons, and linear break even analysis problems.
CO5	Understand the concept of total quality Management including Juran and Deming's philosophy

Course :**Building Planning and Design**

Course Code: BTCVC606 Credits: 2

L:P:T: S:- 2:4:0:0 CIE Marks(MSE+CA1+CA2): 40

Exam Hours: Total Theory Hours: 48

ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	To plan buildings considering various principles of planning and bye laws of governing body
CO2	Comprehend various utility requirements in buildings
CO3	Understand various techniques for good acoustics
CO4	

Course : Waste Water Treatments

Course Code: BTCVC605A Credits: 3

L:P:T: S:- 3:0:0:0 CIE Marks(MSE+CA1+CA2): 40

Exam Hours: Total Theory Hours: 36

ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	Determine the sewage characteristics and design various sewage treatment plants. e
CO2	Understand municipal water and wastewater treatment system design and operation.
CO3	Apply environmental treatment technologies and design processes for treatment of industrial waste water.
CO4	Understand the rural sanitation scheme

Course : Geographic Data Analysis and Applications

Course Code: BTCVC605C Credits: 3

L:P:T: S:- 3:0:0:0 CIE Marks(MSE+CA1+CA2): 40

Exam Hours: Total Theory Hours: 36

ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	-
CO2	-

Course: Advanced Engineering Geology

Course Code: BTCVC605D Credits: 3

L:P:T: S:- 3:0:0:0 CIE Marks(MSE+CA1+CA2): 40

Exam Hours: Total Theory Hours: 36

ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	Understand geological time scale and physiographic division of India and their geological characteristics and different geological formation in India.
CO2	Perform sub surface exploration and interpret core log
CO3	Solve numerical problem based on core drilling and seismic data
CO4	Familiar with origin of earthquake, seismic wave and landslide in Deccan trap

Course: BTCVE 605E Advanced Soil Mechanics

Course Code: BTCVC605E Credits: 3

L:P:T: S:- 3:0:0:0 CIE Marks(MSE+CA1+CA2): 40

Exam Hours: Total Theory Hours: 36

ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	Behavior of soil based on its particle size and mineral content
CO2	Ability to understand the Earth work equipment
CO3	Ability to understand the necessity of ground improvement and potential of a ground for improvement
CO4	Understand the soil reinforcement mechanisms
CO5	Understand the grouting and injection method

Course :**BTCVL607 Concrete Technology Laboratory**

Practical: 2 hours / week

Course : **BTCVL608Building Planning Design and Drawing Laboratory**

Practical: 4 hours / week

Course Outcomes: At the end of the course, student will be able to:

CO1	Draw plan, elevation and section of load bearing and framed structures
CO2	Draw plan, elevation and section of public structures.

BTCVM 609Community Project (Mini Project)

Student shall choose a topic of his interest in consultation with faculty in the department. The topic for community project may be related to Civil Engineering area and/or interdisciplinary area.Student shall attempt to collect necessary information and present a summary indicating comprehension of the topic and acquired depth of knowledge. It is desirable to obtain industry or community sponsorship. Simplified tools or devices may be presented in form of working model and a brief report stating development. A power point presentation shall also be submitted.

BTCVS610Seminar on Topic of Field Visit Road Construction

Student shall visit to ongoing construction sites in field to witness and collect information from works of execution of roads. It is desirable to collect basic information on components of roads, construction machinery, etc. Intention of the work is to introduce the student to the sequential order of execution of road works, preparation of road alignment and various surveys **BTCVF611Industrial Training**

Students are expected to undergo industrial training for at least four weeks at factory / construction site / design offices or in combination of these. Training session shall be guided and certified by qualified engineer / architect / contractor in civil engineering. A neat detailed report on activities carried out during training is expected. Students should undergo training in Summer Vacation after Semester VI and appear at examination in Semester VII.

Semester – VII

Course: Design of Concrete Structures II

Course Code: BTCVC701 Credits: 3
L:P:T:S:- 2:0:1:0 CIE Marks(MSE+CA1+CA2): 40
Exam Hours: Total Theory Hours: 30
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	Able to identify the behavior, analyze and design of the beam sections subjected to torsion.
CO2	Able to analyze and design of axially and eccentrically loaded column and construct the interaction diagram for them.
CO3	Understand various concepts, systems and losses in pre-stressing
CO4	Able to analyze and design the rectangular and symmetrical I-section pre-stressed beam/girders

Course: Infrastructure Engineering

Course Code: BTCVC702 Credits: 3
L:P:T:S:- 3:0:0:0 CIE Marks(MSE+CA1+CA2): 40
Exam Hours: Total Theory Hours: 32
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	Know about the basics and design of various components of railway engineering
CO2	Understand the types and functions of tracks, junctions and railway stations
CO3	Know about the aircraft characteristics, planning and components of airport
CO4	Understand the types and components of docks and harbors

Course: Water Resources Engineering

Course Code: BTCVC703 Credits: 3
L:P:T:S:- 2:0:1:0 CIE Marks(MSE+CA1+CA2): 40
Exam Hours: Total Theory Hours: 38
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	Understand need of Irrigation in India and water requirement as per farming practice in India.
CO2	Understand various irrigation structures and schemes.
CO3	Develop basis for design of irrigation schemes

Course: Professional Practices

Course Code: BTCVC704 Credits: 3

L:P:T:S:- 2:0:1:0 CIE Marks(MSE+CA1+CA2): 40

Exam Hours: Total Theory Hours: 30

ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	Understand the importance of preparing the types of estimates under different conditions for various structures
CO2	Know about the rate analysis and bill preparations and to study about the specification writing.
CO3	Know the various types of contract, accounts in PWD, methods for initiating the works in PWD and tendering
CO4	Understand the valuation of land and buildings, various methods and factors affecting valuation

Course: Plastic Analysis and Design

Course Code: BTCVE705A Credits: 3

L:P:T:S:- 3:0:0:0 CIE Marks(MSE+CA1+CA2): 40

Exam Hours: Total Theory Hours: 36

ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	Understand modes of structural collapse.
CO2	Perform the plastic analysis and design of various determinant and in-determinant structures.

Course: Town and Urban Planning

Course Code: BTCVE706B Credits: 3

L:P:T:S:- 4:0:0:0 CIE Marks(MSE+CA1+CA2): 40

Exam Hours: Total Theory Hours: 36

ESE Marks: 60

Course: BTCVL707 Professional Practices Laboratory

Practical: 2 hours / week

Course Outcomes: At the end of the course, student will be able to:

CO1	Determine different engineering properties of soil
CO2	Identify and classify soils based on standard geotechnical engineering practices.
CO3	Perform Laboratory oratory compaction and in-place density tests.
CO4	Perform and interpret direct shear tests and estimate shear strength parameters

Course: BTCVL708 Design & Drawing of Steel Structures

Practical: 4 hours / week

Course Outcomes: At the end of the course, student will be able to:

CO1	simulate a practical design requirement in to a theoretical statement to solve mathematically to arrive at a safe economical and realistic feasible solution that can be executed,

BTCVP709 Project Phase I
Term work shall consist of detailed report for chosen topic and final working proposed in next semester. Report shall summarise the literature survey, spell out the scope of work, proposed methodology and expected results. It is desirable to have a topic sponsored by Industry or research organization or community.
BTCVF710 Industrial Training Students are expected to undergo industrial training for at least four weeks at factory / construction site / design offices or in combination of these. Training session shall be guided and certified by qualified engineer / architect / contractor in civil engineering. A neat detailed report on activities carried out during training is expected. Students should undergo training in Summer Vacation after Semester VI and appear at examination in Semester VII.

Semester – VIII

Course: Introduction to Earthquake Engineering

Course Code: BTCVC801 Credits: 3
L:P:T:S:- 2:0:1:0 CIE Marks(MSE+CA1+CA2): 40
Exam Hours: Total Theory Hours: 34
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	Capture complexities in earthquake resistant design of structures
CO2	Grasp Nature of earthquake vibration and associated forces on structures
CO3	Understand importance of designing the building to targeted seismic performance.
CO4	

Course: Construction Techniques

Course Code: BTCVE802B Credits: 3
L:P:T:S:- 3:0:0:0 CIE Marks(MSE+CA1+CA2): 40
Exam Hours: Total Theory Hours: 36
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	Understand the planning of new project with site accessibility and services required.
CO2	Comprehend the various civil construction equipment's.
CO3	Familiar with layout of RMC plant, production, capacity and operation process.
CO4	Recognize various aspect of road construction, construction of diaphragm walls, railway track construction etc.

Course: Pavement Management System

Course Code: BTCVE802C Credits: 3
L:P:T:S:- 3:0:0:0 CIE Marks(MSE+CA1+CA2): 40
Exam Hours: Total Theory Hours: 36
ESE Marks: 60

Course: Disaster Preparedness & Planning Management

Course Code: BTCVE802E Credits: 3
L:P:T:S:- 3:0:0:0 CIE Marks(MSE+CA1+CA2): 40
Exam Hours: Total Theory Hours: 36
ESE Marks: 60

Course: Bridge Engineering

Course Code: BTCVE803A Credits: 3
L:P:T:S:- 3:0:0:0 CIE Marks(MSE+CA1+CA2): 40
Exam Hours: Total Theory Hours: 34
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	Understand components of bridges and its various types. 2
CO2	Understand site selection criteria and comprehend various forces acting on bridges.
CO3	Analyze bridge structures using different analysis techniques
CO4	Understand the importance of different types of bridge bearings

Course: Structural Audit

Course Code: BTCVE803B | Credits: 3
L:P:T:S:- 3:0:0:0 | CIE Marks(MSE+CA1+CA2): 40
Exam Hours: | Total Theory Hours: 36
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	Gain the knowledge of Bye laws, procedure of Structural audit and study the typical problems in structures..
CO2	Aware of causes and types of deterioration in structures.
CO3	Develop skills for use of various Nondestructive tests required during auditing of structures.
CO4	Strength evaluation of existing structures.
CO5	Acquire knowledge of legal procedure to conduct structural audits.
CO6	Prepare a Structural audit report

Course: Rock Mechanics

Course Code: BTCVE804A | Credits: 3
L:P:T:S:- 3:0:0:0 | CIE Marks(MSE+CA1+CA2): 40
Exam Hours: | Total Theory Hours: 34
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	Understand the mechanism of rock under various conditions.
CO2	Able to determine the engineering properties of rocks and sub-surface conditions
CO3	Identify various cause of slope failure and suggest some preventive measures for them

Course: Water Power Engineering

Course Code: BTCVE804B | Credits: 3
L:P:T:S:- 3:0:0:0 | CIE Marks(MSE+CA1+CA2): 40
Exam Hours: | Total Theory Hours: 34
ESE Marks: 60

Course: Finite Element Method

Course Code: BTCVE804D | Credits: 3
L:P:T:S:- 3:0:0:0 | CIE Marks(MSE+CA1+CA2): 40
Exam Hours: | Total Theory Hours: 36
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	Understand the different energy methods in structural analysis and basic concepts of finite element method.
CO2	Analyze 1-D problems related to structural analysis like Bars, Trusses, Beams and Frames using finite element approach
CO3	Find solution to problems using direct approach methods like Rayleigh – Ritz or Galerkin's Method.
CO4	Solve 2-D problems using knowledge of theory of elasticity.

CO5	Students will be able to implement the knowledge of numerical methods in FEM to find the solution to the various problems in statics and dynamics.
CO6	Analyze 1D, 2D, and 3D structures using different software packages based on FEM.

Course: Repair & Rehabilitation of Structures

Course Code: BTCVE804E Credits: 3

L:P:T:S:- 3:0:0:0 CIE Marks(MSE+CA1+CA2): 40

Exam Hours: Total Theory Hours: 36

ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	Understand factors of Serviceability and Durability of Structures.
CO2	Determine crack width, effect of crack on materials, effect of moisture on structures.
CO3	Understand methods for protection of steel structures and masonry structures.
CO4	Understand various materials and methodologies used for repairing of structures.
CO5	Understand and implement techniques used for repairing and maintenance of structure.
CO6	Understand procedure to strengthen the existing structures and structural element

BTBS101EngineeringMathematics-I 4 Credits

Course Objectives:

1. To know the application of the matrix technique (Linear algebra) to findsolutions of system of linear equations arising in many engineering problem
2. To know and apply the concept partial derivatives and their applications toMaxima/ Minima , series expansion of multi valued functions.
3. To understand Computation of Jacobian of functions of several variables andtheir applications to engineering problems
4. To identify and sketch of curves in various coordinate system.
5. To evaluate multiple integrals and their applications to area and volume.

Course Outcomes:

Students will be able to :

1. Apply the matrix technique (Linear algebra) to find solutions of system of linearequations arising in many engineering problem
2. Demonstrate the concept partial derivatives and their applications to Maxima/Minima , series expansion of multi valued functions.
3. Compute Jacobian of functions of several variables and their applications toengineering problems
4. Identify and sketch of curves in various coordinate system.
5. Evaluate multiple integrals and their applications to area and volume.

BTBS102/202 Engineering Physics 4 Credits

Course Objectives:

1. To provide a firm grounding in the basic physics principles and concept toresolve many Engineering and technological problems.
2. To understand and study the Physics principles behind the developmentsof Engineering materials.

Course Outcomes:

Students will be able to :

1. Explain & apply the concept of types of Oscillation,Dielectricproperties & ultrsonics
2. Explain & compare between Interference & Polarisation of light ,working Principle of Lasers & Fiber optics
3. Interprete,apply &demonstrate principle of motion of chargedparticles in EF&MF,BAinbridge Mass spectrograph &G M counter
4. Identify Types of crystals & crystal planes using Millerindices,Experemental apprroach.

Expected Outcome:

1. The student will be able to understand Engineering problems based on the principle of Oscillation, Ultrasonics, Optics, Laser, Fibre optics, Nuclear physics, Quantum mechanics.
2. The student will be able to understand Fundamental of Electrodynamics, Semiconductor, Dielectric, Magnetic and Superconducting materials which formsthe base of many modern devices andtechnologies.

BTES103/203 Engineering Graphics 2 Credits

First Year B. Tech Classes (Common to all Branches)

Course Objectives:

1. To make use of drawing instruments effectively for drawing and dimensioning.
2. To understand the conventions and methods of engineering drawing.
3. To know the concept of projections of points, lines, planes, solids and section ofsolids.
4. To understand the Construction isometric and orthographic views of given objects.

Course Outcomes:

Students will be able to :

1. Use of drawing instruments effectively for drawing and dimensioning.
2. Explain conventions and methods of engineering drawing.
3. Apply concept of projections of points, lines, planes, solids and section ofsolids.
4. Construct isometric and orthographic views of given objects.

BTHM104/204 Communication Skills 2 Credits

Course Objectives:

1. To know and apply speaking and writing skills in professional as well as social situations
2. To Overcome Mother Tongue Influence and demonstrate neutral accent while exercising English
3. To know and apply communication skills for Presentations, Group Discussion and interpersonalinteractions.
4. To know and apply grammar correctly during Speaking and Writing situations especially in context withPresentations, Public Speaking, Report writing and Business Correspondence

Course Outcomes:

Students will be able to:

1. Apply speaking and writing skills in professional as well as social situations
2. Overcome Mother Tongue Influence and demonstrate neutral accent while exercising English 3.Apply communication skills for Presentations, Group Discussion and interpersonal interactions.
4. Apply grammar correctly during Speaking and Writing situations especially in context with Presentations,Public Speaking, Report writing and Business Correspondence

BTES105/205 Energy and Environment Engineering 2 Credits

Course Objectives:

1. To Identify conventional ,non conventional energy sources.
2. To understand the power consuming and power developing devices for effective utilization and powerconsumption
3. To Identify various sources of air, water pollution and its effects.
4. To understand noise,soil, thermal pollution and Identify solid, biomedical and hazardous waste.

Course Outcomes:

Students will be able to:

1. Identify conventional ,non conventional energy sources.
2. Knowand discuss power consuming and power developing devices for effective utilization and powerconsumption
3. Identify various sources of air, water pollution and its effects.
4. Know and discuss noise,soil, thermal pollution and Identify solid, biomedical and hazardous waste.

BTES106/206 Basic Civil and Mechanical Engineering Audit

Course Objectives:

1. To Identify various Civil Engineering materials and choose suitable material among various options.
2. To know and apply principles of surveying to solve engineering problem
3. To Identify various Civil Engineering structural components and select appropriate structural system amongvarious options
4. To Explain and define various properties of basic thermodynamics, materials and manufacturing processes.

5. To know and discuss the working principle of various power consuming and power developing devices

Course Outcomes:

Students will be able to:

1. Identify various Civil Engineering materials and choose suitable material among various options.
2. Apply principles of surveying to solve engineering problem
3. Identify various Civil Engineering structural components and select appropriate structural system amongvarious options
4. Explain and define various properties of basic thermodynamics, materials and manufacturing processes.
5. Know and discuss the working principle of various power consuming and power developing devices

BTBS201 Engineering Mathematics – II 4 Credits

Course Objectives:

1. To know and discuss the need and use of complex variables to find roots ,to separate complex quantities and to establish relation between circular and hyperbolic functions.
2. To understand and solve first and higher order differential equations and apply them as amathematical modeling in electric and mechanical systems.
3. To determine Fourier series representation of periodic functions over different intervals.
4. To Demonstrate the concept of vector differentiation and interpret the physical and geometricalmeaning of gradient, divergence &curl in various engineering streams.
5. To know and apply the principles of vector integration to transform line integral to surfaceintegral,surface to volume integral &vice versa using Green‟s , Stoke‟s and Gauss divergence theorems.

Course Outcomes:

Students will be able to:

1. Discuss the need and use of complex variables to find roots ,to separate complex quantities and toestablish relation between circular and hyperbolic functions.
2. Solve first and higher order differential equations and apply them as a mathematical modeling inelectric and mechanical systems.
3. Determine Fourier series representation of periodic functions over different intervals.
4. Demonstrate the concept of vector differentiation and interpret the physical and geometrical meaningof gradient, divergence &curl in various engineering streams.
5. Apply the principles of vector integration to transform line integral to surface integral ,surface tovolume integral &vice versa using Green‟s , Stoke‟s and Gauss divergence theorems.

BTBS102/202 Engineering Chemistry 4 Credits

Course Objectives:

1. To know the demonstration of knowledge of Chemistry in technical fields.
2. To bring adaptability to new developments in Engineering Chemistry and to acquire the skillsrequired to become a perfect engineer.
3. To understand and develop the importance of water in industrial and domestic usage.
4. To identify the concepts of Chemistry to lay the ground work for subsequent studies in variousengineering fields.
5. To examine a fuel and suggest alternative fuels.

Course Outcomes:

Students will be able to:

1. Demonstrate knowledge of chemistry in technical fields.
2. Bring adaptability to new developments in Engineering Chemistry and to acquire the skills requiredto become a perfect engineer.
3. Develop the importance of water in industrial and domestic usage.
4. Identify the concepts of Chemistry to lay the ground work for subsequent studies in variousengineering fields.
5. Examine a fuel and suggest alternative fuels.

BTES103/203 Engineering Mechanics 3 Credits

Course Objectives:

1. To know and apply fundamental Laws of Engineering Mechanics
2. To know and apply Conditions of static equilibrium to analyze given force system
3. To compute Centre of gravity and Moment of Inertia of plane surfaces
4. To compute the motion characteristics of a body/particle for a Rectilinear and CurvilinearMotion
5. To know and discuss relation between force and motion characteristics

Course Outcomes:

Students will be able to:

1. Apply fundamental Laws of Engineering Mechanics
2. Apply Conditions of static equilibrium to analyze given force system
3. Compute Centre of gravity and Moment of Inertia of plane surfaces
4. Compute the motion characteristics of a body/particle for a Rectilinear and CurvilinearMotion
5. Know and discuss relation between force and motion characteristics

BTES104/204 Computer Programming in C 2 Credits

Course Objectives:

1.To give a broad perspective about the uses of computers in engineering industry and CProgramming.

2. To develop the basic concept of algorithm, algorithmic thinking and flowchart.

3. To apply the use of C programming language to implement various algorithms and develops the basic concepts and terminology of programming in general.

4. To make familiar the more advanced features of the C language.

5. To identify tasks in which the numerical techniques learned are applicable and apply them to write programs and hence use computers effectively to solve the task.

Course Outcomes:

Students will be able to:

1. Gain a broad perspective about the uses of computers in engineering industry and C Programming.

2. Develop the basic concept of algorithm, algorithmic thinking and flowchart.

3. Apply the use of C programming language to implement various algorithms and develops the basic concepts and terminology of programming in general.

4. Use the more advanced features of the C language.

5. Identify tasks in which the numerical techniques learned are applicable and apply them to write programs and hence use computers effectively to solve the task.

BTES106/206 Basic Electrical and Electronics Engineering Audit

Course Objectives:

1. To know and apply basic ideas and principles of electrical engineering.
2. To Identify protection equipment and energy storage devices.
3. To differentiate electrical and electronics domains and explain the operation of diodes andtransistors.
4. To acquire knowledge of digital electronics
5. To design simple combinational and sequential logic circuits.

Course Outcomes:

Students will be able to:

1. Apply basic ideas and principles of electrical engineering.
2. Identify protection equipment and energy storage devices.
3. Differentiate electrical and electronics domains and explain the operation of diodes andtransistors.
4. Acquire knowledge of digital electronics
5. Design simple combinational and sequential logic circuits.

Master of Computer Applications (M.C.A) Degree Program

MCA -First Year [First Semester] 28-01-2021

Code: MCA-R101 Programming Logic Concepts **Credits: 04**

Course Outcome:

Students will be able to demonstrate programming language design concepts in a language they learn independently Improve your ability to develop effective algorithms, Improve the use of your existing programming language, Increase your vocabulary of useful programming constructs, Allow a better choice of programming language, Make it easier to learn a new language**.**

Code: MCA-R 102 Data Structures using C **Credits: 04**

Course Outcome:

Upon successful completion of this course, students will understand the organization and operations of data structures Stack Queues, Trees, Graphs, Heaps and Hash tables. They will also be able to identify suitable algorithms with appropriate data structures for real time software requirements.

Code: MCA-R103 Computer Organizations and Architecture **Credits: 04**

Course Outcome:

Upon successful completion of this course, students will be able to explain about computer architecture, components, hardware level processing, interfacing of components, etc

Code: MCA -R104 Introduction to Management Functions **Credits: 04**

Course Outcomes

Upon successful completion of this course, the students will have understanding of various management concepts including management hierarchy, understanding the importance of planning and controlling and how to implement it, study the motivation theories and use it in real world problems, etc.

Code: MCA -R105 Mathematical Foundations for Computer Science **Credits: 04**

Course Outcomes

At the end of the course student will be able to understand the notion of mathematical thinking, mathematical proofs and to apply them in problem solving. They will have ability to apply discrete structures into computing problems, formal specification, artificial intelligence, cryptography, Data Analysis.

Code: MCA -R106 Lab -1 C Programming Lab covering topics in MCA-R101 and MCA-R102

Credits: 02

Course Outcomes

At the end of the course student will be able to understand the notion of programming for solving a problem. They will be conversant with writing elementary programs in C. Further, they will be able to apply their skills in programming to implement data structures as well as to implement logics of the algorithms

Code: MCA -R107 Lab -2 H/W – S/W lab covering topics in MCA-R103 **Credits: 02**

Course Outcomes

At the end of the course student will be able to understand working of basic hardware part,machine level processing, functions of microprocessors.

Code: MCA -R108 Lab -3 C Programming Lab covering topics in MCA-R105 **Credits: 02**

Course Outcomes

At the end of the course student will be able to understand working of basic C language constructs, libraries for mathematical theorem proving

Code:MCA -R109 Survey : Survey on Emerging Technologies in Computer Science and Information Technology

Credits: 02

Course Outcome:

Understanding of current trends in IT Industry / Research for their after MCA progression

SEM II

MCA-R201 Understanding Operating
MCA-R202 Introduction to Theory of Computations
MCA-R203 Software Engineering and Software Testing
MCA-R204 OOPs with Java
MCA-R205 Advanced Database Management System
Practical / Lab
MCA-R206 Lab -4: Based on MCA- R203 MCA-R207
Lab-5: Based on MCA- R204
MCA-R208 Lab-6: Based on Elective Course 205 A or 205
MCA-R209 B Professional Communication Skills (In-house Open Elective)

MCA (02 Years Program) Second Year
[Third Semester]

MCA-R301 Visual Programming Tools
MCA-R302 Mobile Application Development
MCA-R303 Python Programming
MCA-R304B Management Information System
MCA-R305D Course Name: Internet of Things (IOT)
MCA-R306 Lab -7 : Lab on Visual Programming Tools
MCA-R306 Lab -8 : Lab on Mobile Application Development
MCA-R306 Lab -9 : Lab on Python Programming
MCA-R309B Cyber Security

MCA –Second Year Syllabus Structure
IV Semester

MCA-R401 C Deep Learning
Course Outcomes
CO1 Demonstrate Tensor flow/Keras deep-learning workstations.Understanding
CO 2 Choose appropriate data preprocessing techniques to build neural network models.Applying
CO 3 Analyze different regularization and optimization techniques used in deeplearning.Creating
CO 4 Build neural network models using deep learning algorithms-CNN and RNN to solve real world problems.Evaluating

MCA-R402 A Advanced Web Technology
Course Outcomes
CO1 Apply the concept of Client Server architecture.
CO 2 Develop web applications using standard ASP.Net control and validation control.
CO 3 Design and develop interactive web applications using master page and theme.
CO 4 Develop asynchronous web application using database programming and Ajax.

MCA-R405 Lab-10: Based on Elective Course-3
MCA-R406 Lab-11: Based on Elective Course-4
MCA-R407 Lab-12: Project Work

Lab Course Outcomes: On successful completion of course learner/student will be able to

Sr. No.	Course Outcome	Bloom Level
CO1	Demonstrate the ability to produce a technical document.	Understanding
CO2	Identify problems based on environmental, societal & research needs.	Applying
CO3	Apply Knowledge and skills to analyze and interpret data by applying appropriate research methods to solve societal problems in a group.	Applying
CO4	Design and evaluate solutions for complex problems.	Creating
CO5	Build small groups to work effectively in team on medium scale computing projects.	Creating
CO6	Create value addition for the betterment of the individual and society	Creating

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Program Outcomes (PO) for Master of Computer Applications
On completion of MCA program, the students are expected to

PO1: Apply knowledge of computing fundamentals, computing specialization, mathematics, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements.

PO2: Identify, formulate, research literature, and solve complex computing problem searching substantiated conclusions using fundamental principles of mathematics, computing sciences, and relevant domain disciplines.

PO3: Design and evaluate solutions for complex computing problems, and design and evaluate systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.
PO4: Use research-based knowledge and research methods including design of experiments, analysis and nterpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Create, select, adapt and apply appropriate techniques, resources, and modern computing tools to complex computing activities, with an understanding of the limitations.

PO6: Understand and commit to professional ethics and cyber regulations, responsibilities, and norms of professional computing practice.

PO7: Recognize the need, and have the ability, to engage in independent learning for continual development as a computing professional.

PO8: Demonstrate knowledge and understanding of the computing and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

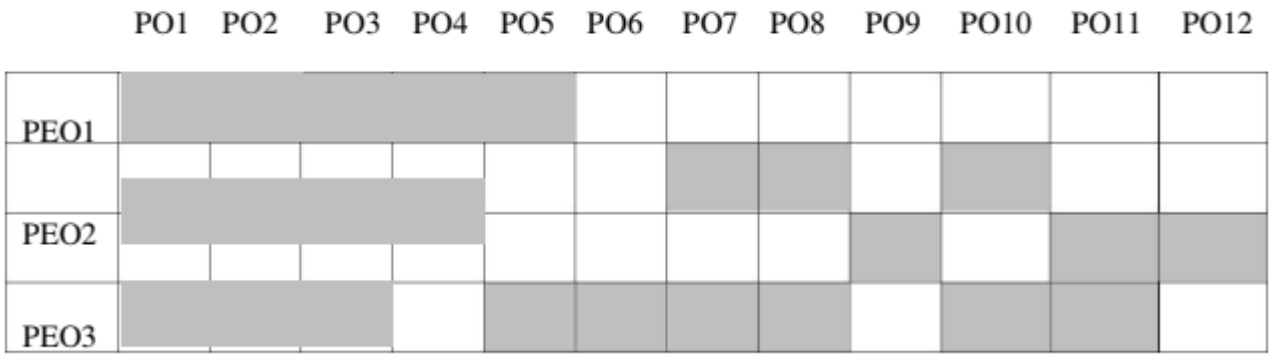
PO9: Communicate effectively with the computing community, and with society at large, about complex computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations, and give and understand clear instructions.

PO10: Understand and assess societal, environmental, health, safety, legal, and cultural issues within local and global contexts, and the consequential responsibilities relevant to professional computing practice.

PO11: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary environments.

PO12: Identify a timely opportunity and using innovation to pursue that opportunity to create value and wealth for the betterment of the individual and society at large.

PEO-PO Mapping:



Mapping with Program Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	S	S	S	S	M	L	M	S	S	-		-
CO2	S	S	S	M	M	L	M	M	S	-	-	-
CO3	S	S	S	M	M	L	L	M	S	-	-	-
CO4	S	S	S	M	M	L	L	M	S	-	-	-
CO5	S	S	S	M	M	L	S	M	L	-	-	-
CO6	S	S	S	S	M	L	L	M	S	-	-	-

S- Strong; M-Medium; L-Low

BTCOE702 Cloud Computing

[**Lecture: 3 Periods/Week** **CA: 20 Marks**
End Semester Examination: 60 Marks **MSE: 20 Marks**

Prerequisites: Discrete Mathematics, Computer Networks

Course Objectives:
1. To understand the concepts of Cloud Computing.
2. To learn Taxonomy of Virtualization Techniques.
3. To learn Cloud Computing Architecture.
4. To acquire knowledge on Aneka Cloud Application Platform.
5. To learn Industry Cloud Platforms.

Course Outcomes:
At the end of this course student will:
CO1) Understand the concept of virtualization and how this has enabled the development of Cloud Computing
CO2) Know the fundamentals of cloud, cloud Architectures and types of services in cloud CO3) Understand scaling, cloud security and disaster management
CO4) Design different Applications in cloud
CO5) Explore some important cloud computing driven commercial systems

Constitution of India

Teaching Scheme : 2 Lectures / Week

Course Objectives :
1. To familiarize the students with the key elements of the Indian constitution.
2. To enable students to grasp the constitutional provisions and values.
3. To acquaint the students with the powers and functions of various constitutional offices and Institutions.
4. To make students understand the basic premises of Indian politics and role of constitution and citizen oriented measures in a democracy.

Course Outcomes :
At the end of the course the students will
CO1 : Understand the key aspects of the Indian Constitution.
CO2 : Comprehend the structure and philosophy of the Constitution
CO3 : Understand the power and functions of various constitutional offices and institutions.
CO4 : Realise the significance of the constitution and appreciate the role of constitution and citizen oriented measures in a democracy.

UNIVERSAL HUMAN VALUES – II

Course Objectives :
1. To help the students appreciate the essential complementarily between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity which are the core aspirations of all human beings

2． To facilitate the development of a Holistic perspective among students towards life and profession as well as towards happiness and prosperity based on a correct understanding of the Human reality and the rest of existence． Such a holistic perspective forms the basis of Universal Human Values and movement towards value-based living in a natural way

3． To highlight plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually fulfilling human behavior and mutually enriching interaction with Nature．

Course Outcomes：

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

2.6.1 – COURSE OUTCOMES FOR ALL COURSES

Program: Information Technology

Academic Year: 2018-2019

Semester: III

Course: Engineering Mathematics III

Course Code: CI201 Credits: 4
L:P:T : 3:0:1 CIE Mark :MSE 20
Exam Hours: 3 Hours Total Theory Hours: 36
ESE Marks: 80

Course Outcomes: At the end of the course, student will be able to:

CO1	Interpret the mathematical results in physical and other forms.
CO2	Identify, formulate and solve the Linear Differential Equations
CO3	Classify and solve the contour integration of complex functions.

Course: Discrete Mathematics

Course Code: CI202 Credits: 4
L:P:T : 3:0:1 CIE Mark :MSE 20
Exam Hours: 3 Hours Total Theory Hours: 36
ESE Marks: 80

Course Outcomes: At the end of the course, student will be able to:

CO1	Understand a number of substantive and diverse topics covered in this course.
CO2	Develop an important new skill, the ability to write a mathematical proof, which is an excellent training for writing good computer programs.

Course: Data Structures

Course Code: CI203 Credits: 5
L:P:T : 4:2:0 CIE Mark :MSE 20
Exam Hours: 3 Hours Total Theory Hours: 36
ESE Marks: 80

Course Outcomes: At the end of the course, student will be able to:

CO1	Choose the appropriate data structure for modeling a given problem.
CO2	Understand and implement various data structures along with their application.

Course: Digital Systems

Course Code: CI204 Credits: 5
L:P:T : 4:2:0 CIE Mark :MSE 20
Exam Hours: 3 Hours Total Theory Hours: 36
ESE Marks: 80

Course Outcomes: At the end of the course, student will be able to:

CO1	Understand several fundamental concepts that can be applied to a wide variety of digital design problems
CO2	Apply knowledge of Hardware Description Language in designing.

Course: Economics for Engineers

Course Code: CI205 Credits: 3
L:P:T : 3:0:0 CIE Mark :MSE 20
Exam Hours: 3 Hours Total Theory Hours: 36
ESE Marks: 80

Course Outcomes: At the end of the course, student will be able to:

CO1	Understand various concepts of economics.
CO2	Economically plan for their own project.
CO3	Get accustomed to the tax structure prevalent in the Indian economy.

Course: Programming Lab-I

Course Code: CI206 Credits: 1
L:P:T : 2:2:0 CIE Mark :CE 30
Exam Hours: 3 Hours Total Theory Hours: 36
ESE Marks: 70

Course Outcomes: At the end of the course, student will be able to:

CO1	Write programs using advance concepts of C- language.
CO2	Understand and apply the pointers, memory allocation techniques and use of files for dealing with variety of problems.
CO3	Design graphics programs using C.

Semester: IV

Course : Microproccessors & Microcontrollers

Course Code: CI208
L:P:T: 4:2:0
Exam Hours: 3 Hours
ESE Marks: 80

Credits: 5
CIE Marks(MSE): 20
Total Theory Hours: 36

Course Outcomes: : By the end of the course students will be able to :

CO1	Understand microprocessor, microcontroller and ARM architectures
CO2	Write assembly language and C programs for microprocessors and microcontrollers.
CO3	Perform Hands-on with various interfaces: LCD, Keyboard, ADC, DAC, and other peripherals using 8051

Course: Computer Algorithms

Course Code: CI208
L:P:T: 4:0:0
Exam Hours: 3 Hours
ESE Marks: 80

Credits: 4
CIE Marks(MSE): 20
Total Theory Hours: 36

Course Outcomes: By the end of the course students will be able to

CO1	Analyze any algorithms and able to calculate their theoretical complexity.
CO2	Understand the problem solving methods such as recurrences, dynamic programming and greedy method
CO3	Understand Np-Hard and Np-complete concepts.

Course: System Programming

Course Code: CI210 Credits: 4
L:P:T: 4:0:0 CIE Marks(MSE): 40
Exam Hours: 3Hours Total Theory Hours: 36
ESE Marks: 80

Course Outcomes: By the end of the course students will be able to

CO1	Understand different components of system software.
CO2	Understand intermediate code generation in context of language designing.
CO3	Recognize operating system functions such as memory management as pertaining to run time storage management.

Course : Object Oriented Programming with C++

Course Code: CI211 Credits: 4
L:P:T: 3:2:0 CIE Marks(MSE): 40
Exam Hours: 3Hours Total Theory Hours: 36
ESE Marks: 80

Course Outcomes: By the end of the course students will be able to

CO1	Understand key features of the object-oriented programming language such as encapsulation (abstraction), inheritance, and polymorphism
CO2	Design and implement object-oriented applications
CO3	Analyze problems and implement simple C++ applications using an object-oriented software engineering approach

Course : Numerical Methods & Scientific Computing

Course Code: CI212 Credits: 4
L:P:T: 3:0:1 CIE Marks(MSE): 40
Exam Hours: 3Hours Total Theory Hours: 36
ESE Marks: 80

Course Outcomes: At the end of the course students will be able to :

CO1	Understand the mathematical background for the different numerical methods and probability distributions introduced in the course.
CO2	Learn the different numerical methods to solve the algebraic equations and to solve system of linear and non linear equations.
CO3	Understand the different numerical methods for interpolation, differentiation, integration and solving set of ordinary differential equations

Semester: V

Course: Operating System

Course Code: IT301
L:T:P: 4:0:2
Exam Hours: 3
ESE Marks: 80

Credits: 5
CIE Marks(MSE): 20
Total Theory Hours: 36

Course Outcomes: After completion of this course the student will be able to:

CO1	Describe the general architecture of computers.
CO2	Describe process management, scheduling and synchronizations.
CO3	Understand and analyze theory and implementation of processes, memory management, physical and virtual memory, scheduling, file management and security.

Course: Automata Theory

Course Code: IT302
L:T:P: 3:1:0
Exam Hours: 3
ESE Marks: 80

Credits: 3
CIE Marks(MSE): 20
Total Theory Hours: 36

Course Outcomes: After completion of this course the student will be able to:

CO1	Understand the concepts of automata, formal grammars and languages.
CO2	Identify the capabilities and limitations of computing machine
CO3	Model various kinds of real-time problems.

Course: Database Management Systems

Course Code: IT303
L:T:P: 4:0:2
Exam Hours: 3
ESE Marks: 80

Credits: 5
CIE Marks(MSE): 20
Total Theory Hours: 36

Course Outcomes: After completion of this course the student will be able to:

CO1	Demonstrate an understanding of the relational data model
CO2	Transform an information model into a relational database schema and to use a data definition language and/or utilities to implement the schema using a DBMS
CO3	Formulate, using relational algebra, solutions to a broad range of query problems.
CO4	Formulate, using SQL, solutions to a broad range of query and data update problems.

Course: Data Communication & Networks

Course Code: IT304
L:T:P: 3:1:2
Exam Hours: 3
ESE Marks: 80

Credits: 4
CIE Marks(MSE): 20
Total Theory Hours: 36

Course Outcomes: After completion of this course the student will be able to:

CO1	Independently understand basic computer networks technology and understand the concepts data communications system and its components.
CO2	Explain Transmission media signal modulation techniques and enumerate the layers of the OSI model and TCP/I
CO3	Understand Error Detection & Correction codes and multiple access & IEEE 802.3

Course: Elective-I(Java Programming)

Course Code: IT305
L:T:P: 3:1:2
Exam Hours: 3
ESE Marks: 80

Credits: 4
CIE Marks(MSE): 20
Total Theory Hours: 36

Course Outcomes: After completion of this course the student will be able to:

CO1	Student should know the model of object oriented programming and fundamental features of an object oriented language
CO2	Student should know how to test, document and prepare a professional looking package for each business project.
CO3	Student have the ability to write a computer program to solve specified problems and to use the Java SDK environment to create, debug and run simple Java programs
	Student will be able to explain and develop programs for inheritance, multithreading, applets, exception handling and file handling

Course: Elective-I(Digital Signal Processing)

Course Code: IT306
L:T:P: 3:1:2
Exam Hours: 3
ESE Marks: 80

Credits: 4
CIE Marks(MSE): 20
Total Theory Hours: 36

Course Outcomes: After completion of this course the student will be able to:

CO1	Various error detecting codes.
CO2	Understand Frequency Domain Analysis of LTI Systems and Digital Filter Structures and digital filter design
CO3	Formulate engineering problems in terms of DSP tasks and apply engineering problem solving strategies to DSP problems
CO4	Design and test DSP algorithms and analyze digital and analog signals and systems

Course: Elective-I(Information Theory and Coding)

Course Code: IT307
L:T:P: 3:1:2
Exam Hours: 3
ESE Marks: 80

Credits: 4
CIE Marks(MSE): 20
Total Theory Hours: 36

Course Outcomes: After completion of this course the student will be able to:

CO1	Understand various source coding techniques
CO2	Implement entropy and Mark-off statistical model.
CO3	Various error detecting codes.

Course: Web Technology Lab-I

Course Code: IT308
L:T:P: 3:1:2
Exam Hours: 3
ESE Marks: 70

Credits: 4
CIE Marks(MSE): 30
Total Theory Hours: 36

Course Outcomes: After completion of this course the student will be able to:

CO1	Design web pages.
CO2	Format and validate web pages.
CO3	Design web sites and deploy it on web servers.

Semester: VI

Course: Software Engineering

Course Code: IT 309 Credits: 4
L:P:T: 4:0:0 CIE Marks(MSE): 20
Exam Hours: 3hrs Total Theory Hours: 36
ESE Marks: 80

Course Outcomes: At the end of the course, student will be able to:

CO1	Learn basic principles of Software Engineering
CO2	Understand Software Engineering concepts, methodologies and best practices.
CO3	Learn Software Engineering principles and approach used in industry.

Course: Compiler Design

Course Code: IT 310 Credits: 4
L:P:T: 3:2:1 CIE Marks(MSE): 20
Exam Hours: 3hrs Total Theory Hours: 36
ESE Marks: 80

Course Outcomes: At the end of the course, student will be able to:

CO1	To acquire the knowledge of modern compiler & its features.
CO2	To learn & use the new tools and technologies used for designing a compiler.
CO3	To use the knowledge of patterns, tokens & regular expressions for solving a problem in the field of data mining.

Course: Computer networks

Course Code: IT 311
L:P:T: 4:2:0
Exam Hours: 3hrs
ESE Marks: 80

Credits: 4
CIE Marks(MSE): 20
Total Theory Hours: 36

Course Outcomes: At the end of the course, student will be able to:

CO1	Demonstrate an understanding of the TCP/IP model.
CO2	To be able to understand and configure IP addresses.
CO3	Should be able to do the analysis of data traffic on TCP/IP networks.
CO4	To be able to apply knowledge of TCP/IP in building LAN.

Course: Unix Operating System

Course Code: IT 312
L:P:T: 3:2:1
Exam Hours: 3hrs
ESE Marks: 80

Credits: 4
CIE Marks(MSE): 20
Total Theory Hours: 36

Course Outcomes: At the end of the course, student will be able to:

CO1	Learn UNIX structure, commands, and utilities.
CO2	Describe and understand the UNIX file system.
CO3	Write shell scripts in order to perform shell programming.
CO4	Acquire knowledge about text processing utilities, process management and system operation of UNIX.

Course: Elective –II (python programming)

Course Code: IT 313
L:P:T: 3:2:1
Exam Hours: 3hrs
ESE Marks: 80

Credits: 4
CIE Marks(MSE): 20
Total Theory Hours: 36

Course Outcomes: At the end of the course, student will be able to:

CO1	Define and demonstrate the use of built-in data structures “lists” and “dictionary”.
CO2	Design and implement a program to solve a real world problem.
CO3	Design and implement GUI application and how to handle exceptions and files.
CO4	Make database connectivity in python programming language.

Course: Elective –II (Advanced database management systems)

Course Code: IT 314
L:P:T: 3:2:1
Exam Hours: 3hrs
ESE Marks: 80

Credits: 4
CIE Marks(MSE): 20
Total Theory Hours: 36

Course Outcomes: At the end of the course, student will be able to:

CO1	Demonstrate an understanding of the object oriented and distributed data models.
CO2	Create database systems using xml.
CO3	Demonstrate ability to prepare UML diagrams for information systems.
CO4	Formulate, using SQL, solutions to a broad range of query and data update problems.

Course: Elective –II(Computer Organization & Architecture)

Course Code: IT 315
L:P:T: 3:2:1
Exam Hours: 3hrs
ESE Marks: 80

Credits: 4
CIE Marks(MSE): 20
Total Theory Hours: 36

Course Outcomes: At the end of the course, student will be able to:

CO1	To have understanding with clarity and completely, the nature and characteristics of modern-day computer organization
CO2	To gain knowledge for contemporary architectures like Intel's Core I-7, ARM and ATmega series

Course: Web Technology Lab-II

Course Code: IT 317
L:P:T: 1:2:0
Exam Hours: 3hrs
ESE Marks: 80

Credits: 4
CIE Marks(MSE): 20
Total Theory Hours: 36

Course Outcomes: At the end of the course, student will be able to:

CO1	Design and deploy web application using servlets.
CO2	Design and deploy web application using JSPs.
CO3	Design and deploy web application using PHP.

Semester: VII

Course: Information and Network Security

Course Code: IT401 Credits: 4
L:P:T:: 4:0:2 CIE Marks(MSE):20
Exam Hours: 3 hours Total Theory Hours: 36
ESE Marks: 80

Course Outcomes: At the end of the course, student will be able to:

CO1	Understand the principle of encryption algorithms; conventional and public key cryptography.
CO2	Have detailed knowledge about authentication, hash functions and application level security mechanisms.
CO3	Know the network security tools and applications and to understand the system level security used.

Course: Data Mining & Data Warehouse

Course Code: IT402 Credits: 4
L:P:T: 4:0:2 CIE Marks(MSE): 20
Exam Hours: 3 hours Total Theory Hours: 36
ESE Marks: 80

Course Outcomes: At the end of the course, student will be able to:

CO1	Design schema for real time data warehousing applications.
CO2	Process raw data to make it suitable for various data mining algorithms.
CO3	Discover and measure interesting patterns from different kinds of databases.
CO4	Apply the techniques of clustering, classification, association finding, feature selection and visualization to real world data
CO5	Use various data mining tools such as weka, etc.

Course: Elective –III (EMBEDDED SYSTEM)

Course Code: IT403 Credits: 4
L:P:T: 4:0:2 CIE Marks(MSE): 20
Exam Hours: 3 hours Total Theory Hours: 36
ESE Marks: 80

Course Outcomes: At the end of the course, student will be able to:

CO1	Understand the embedded system with Processors and IC technologies
CO2	Understand ARM7TDMI, its registers and their internal functions.
CO3	Good understanding and issues to be handled in using any processor, software tools chain for embedded software solution development..
CO4	Understand interactive interface with pi and peripheral devices.
CO5	Understand peripherals with hands-on circuits and python programming

Course: Elective –III (Digital Image Processing)

Course Code: IT404 Credits: 4
L:P:T: 4:0:2 CIE Marks(MSE): 20
Exam Hours: 3 hours Total Theory Hours: 36
ESE Marks: 80

Course Outcomes: At the end of the course, student will be able to:

CO1	Discuss digital image fundamentals
CO2	Apply image enhancement and restoration techniques
CO3	Use image compression and segmentation Techniques.

Course: Elective –III (Perl Programming)

Course Code: IT405 Credits: 4
L:P:T: 4:0:2 CIE Marks(MSE): 20
Exam Hours: 3 hours Total Theory Hours: 36
ESE Marks: 80

Course Outcomes: At the end of the course, student will be able to:

CO1	Understand basics of Perl .
CO2	Understand list arrays and hash.
CO3	Understand modules.
CO4	Understand CGI scripts.
CO5	Understand database connectivity.

Course: Elective –III (Green IT- Principles and Practices)

Course Code: IT406 Credits: 4
L:P:T: 4:0:2 CIE Marks(MSE): 20
Exam Hours: 3 hours Total Theory Hours: 36
ESE Marks: 80

Course Outcomes: At the end of the course, student will be able to:

CO1	Students will be able to create awareness among stakeholders and promote green agenda and green initiatives in their working environments leading to green movement.
CO2	This green movement will create new career opportunities for IT professionals, auditors and others with special skills such as energy efficiency, ethical IT assets disposal, carbon footprint estimation, reporting and development of green products, applications and services

Course: Elective –IV (Software Testing and Quality Assurance)

Course Code: IT407 Credits: 3
L:P:T: 4:0:2 CIE Marks(MSE): 20
Exam Hours: 3 hours Total Theory Hours: 36
ESE Marks: 80

Course Outcomes: At the end of the course, student will be able to:

CO1	Apply modern software testing processes in relation to software development and project management
CO2	Create test strategies and plans, design test cases, prioritize and execute them
CO3	Manage incidents and risks within a project.

Course: Elective –IV (Unified Modeling Language)

Course Code: IT408 Credits: 3
L:P:T: 4:0:2 CIE Marks(MSE): 20
Exam Hours: 3 hours Total Theory Hours: 36
ESE Marks: 80

Course Outcomes: At the end of the course, student will be able to:

CO1	Create models for software applications
CO2	Use the different UML notations for designing software.

Course: Elective –IV (Mobile Application Development)

Course Code: IT409 Credits: 3
L:P:T: 4:0:2 CIE Marks(MSE): 20
Exam Hours: 3 hours Total Theory Hours: 36
ESE Marks: 80

Course Outcomes: At the end of the course, student will be able to:

CO1	Understanding Android as new technology for developing mobile application.
CO2	Understanding design of GUI, database and provide connection.
CO3	Understanding android services and publishing the android application on market.

Course: Elective –IV (Management Information System)

Course Code: IT410
L:P:T: 4:0:2
Exam Hours: 3 hours
ESE Marks: 80

Credits: 3
CIE Marks(MSE): 20
Total Theory Hours: 36

Course Outcomes: At the end of the course, student will be able to:

CO1	Understand information systems and their uses
CO2	Use computerized management information systems.
CO3	In-depth analysis and decision making.
CO4	Aware of security issues related to information systems.

Course: Application Development Lab using Android

Course Code: IT411
L:P:T: 2:0:2
Exam Hours: 3 hours
ESE Marks: 80

Credits: -
CIE Marks(MSE): 20
Total Theory Hours: 36

Course Outcomes: At the end of the course, student will be able to:

CO1	Understanding of different components of Android environment.
CO2	Understanding basics of android application development.
CO3	Understanding GUI design and connectivity with database using SQLite.

2.6.1 – COURSE OUTCOMES FOR ALL COURSES

Program: Information Technology

Academic Year: 2021-22

Semester: III

Course: Engineering Mathematics - III

Course Code: BTBS301 Credits: 4
L:P:T:: 3:0:1 CIE Marks(MSE+CA1+CA2): 40
Exam Hours:3 Hours Total Theory Hours: 36
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	To develop an ability to use characteristics of complex numbers in problem pertaining to electric circuits
CO2	To develop an acquaintance with the method of finding solution of differential equations.
CO3	To develop an in-depth knowledge of vector differentiation and vector integration.
CO4	To develop Fourier series expansion of different periodic functions.

Course: Interpersonal Communication Skills and Self-Development for Engineers

Course Code: BTHM3402 Credits: 2

L:P:T:: 2:0:0 CIE Marks(MSE+CA1+CA2): 40

Exam Hours:3 Hours Total Theory Hours: 36
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	To acquire interpersonal communication skills
CO2	To develop the ability to work independently.
CO3	To develop the qualities like self-discipline, self-criticism and self-management.
CO4	To have the qualities of time management and discipline
CO5	To present themselves as an inspiration for others.

Course: Computer Architecture and Organization

Course Code: BTITC303* Credits: 4

L:P:T:: 3:0:1 CIE Marks(MSE+CA1+CA2): 40

Exam Hours:3 Hours Total Theory Hours: 36
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	To identify components of a computer system including CPU, memory and input/output units.
CO2	To explain instruction types, its execution and interrupt mechanism.
CO3	To illustrate numerical and character representations in digital logic and floating-point arithmetic.

Course: Object Oriented Paradigm with C++

Course Code: BTITC304 Credits: 4

L:P:T:: 3:0:1 CIE Marks(MSE+CA1+CA2): 40

Exam Hours:3 Hours Total Theory Hours: 36
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	To draw the control flow of a program.
CO2	To understand the storage concepts in a simple program.
CO3	To program using basic concepts of OO languages i.e. objects, encapsulation, data hiding, polymorphism etc.
CO4	To program using advanced concepts of OO languages such as exception handling etc.
CO5	To work with files and its different mode.

Course: Data Structures and Applications

Course Code: BTITC305 Credits: 4

L:P:T:: 3:0:1 CIE Marks(MSE+CA1+CA2): 40

Exam Hours:3 Hours Total Theory Hours: 36
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	To write neat code by selecting appropriate data structure and demonstrate a working solution for a given problem
CO2	To think of all possible inputs to an application and handle all possible errors properly
CO3	To analyze clearly different possible solutions to a program and select the most efficient one
CO4	To write an application to demonstrate a good working solution.
CO5	To demonstrate the ability to write reusable code and abstract data types with object based approach.

Semester: IV

Course: Organizational Behavior

Course Code: BTITHM401 Credits: 3
L:P:T: 3:0:0 CIE Marks(MSE+CAI+CAII): 40
Exam Hours: 3 Hours Total Theory Hours: 36
ESE Marks: 60

Course Outcomes: : After learning the course, the students should be able

CO1	To become more self-aware and have identified areas of development for long term effectiveness
CO2	To understand the role that individuals play collectively to perform in organizations.

Course : Probability and Statistics

Course Code: BTITC402 Credits: 4
L:P:T: 3:0:1 CIE Marks(MSE+CAI+CAII): 40
Exam Hours: 3 Hours Total Theory Hours: 36
ESE Marks: 60

Course Outcomes: : After learning the course, the students should be able:

CO1	To acquire analytical ability in solving mathematical problems as applied to the respective branches of engineering

Course: Discrete Mathematic

Course Code: BTITC403 Credits: 3
L:P:T: 3:1:0 CIE Marks(MSE+CAI+CAII): 40
Exam Hours: 3 Hours Total Theory Hours: 36
ESE Marks: 60

Course Outcomes: : After learning the course, the students should be able:

CO1	To perform operations on various discrete structures such as sets functions, relations and sequences
CO2	To solve problems using counting techniques, permutation and combination, recursion and generating functions
CO3	To use graphs as tools to visualize and simplify problems.
CO4	To solve problems using algebraic structures (Rings, Monoids and Groups).

Course: Design and Analysis of Algorithms

Course Code: BTITC404
L:P:T: 3:0:1
Exam Hours: 3 Hours
ESE Marks: 60

Credits: 3
CIE Marks(MSE+CAI+CAII): 40
Total Theory Hours: 36

Course Outcomes: : After learning the course, the students should be able:

CO1	To develop efficient algorithms for simple computational tasks.
CO2	To understand concepts of time and space complexity, worst case, average case and best case complexities
CO3	To design algorithms such as sorting, searching and problems involving graphs.
CO4	To compute complexity measures of recursive algorithms using recurrence relations.

Course : Elective-I (Digital Logic and Microprocessor)

Course Code: BTITPE405A
L:P:T: 2:0:1
Exam Hours: 3 Hours
ESE Marks: 60

Credits: 3
CIE Marks(MSE+CAI+CAII): 40
Total Theory Hours: 36

Course Outcomes: : After learning the course, the students should be able:

CO1	To apply the knowledge of number systems and codes in problem solving related to code conversion and number system and optimize circuit design..
CO2	To explain the fundamental concepts of combinational and sequential logic devices and design them
CO3	To explain 8086 architecture and its instruction set.
CO4	To develop assembly language programs for the X86 microprocessor.
CO5	To interface peripheral chips and describe the role of interrupt in microprocessor family

Course: Elective-I (Web Technology)

Course Code: BTITPE405B
L:P:T: 2:0:1
Exam Hours: 3 Hours
ESE Marks: 60

Credits: 3
CIE Marks(MSE+CAI+CAII): 40
Total Theory Hours: 36

Course Outcomes: : After learning the course, the students should be able:

CO1	To understand World Wide Web and latest trends in web development.
CO2	To obtain real world knowledge of design and development
CO3	To design and develop web application with all industrial standards.
CO4	To understand web hosting, server types and debugging.

Course: Elective-I (Physics of Engineering Materials)

Course Code: BTITPE405C
L:P:T: 2:0:1
Exam Hours: 3 Hours
ESE Marks: 60

Credits: 3
CIE Marks(MSE+CAI+CAII): 40
Total Theory Hours: 36

Course Outcomes: : After learning the course, the students should be able:

CO1	To understand fundamentals of Electrodynamics, Crystal structure, Semiconductors, Dielectrics, Nano materials, Magnetic and superconducting materials
CO2	To understand the basics of advanced devices and technology.

Semester: V

Course: Software Engineering

Course Code: BTITC501*
L:P:T: 3:1:0
Exam Hours:
ESE Marks: 60

Credits: 4
CIE Marks(MSE+CA1+CA2): 40
Total Theory Hours: 36

Course Outcomes: At the end of the course, student will be able to:

CO1	To use the techniques, skills, and Modern Engineering tools necessary for Engineering practice
CO2	To design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
CO3	To identify, formulate and solve Engineering Problems.

Course: Computer Networks and Internetworking Protocols

Course Code: BTITC502
L:P:T: 3:1:0
Exam Hours: 3
ESE Marks: 60

Credits: 4
CIE Marks(MSE+CA1+CA2): 40
Total Theory Hours: 36

Course Outcomes: At the end of the course, student will be able to:

CO1	To compare and contrast TCP and UDP in terms of the application that uses them
CO2	To design network-based applications using the socket mechanism
CO3	To work with IPv4 addresses in terms of subnetting and supernetting.
CO4	To setup a host and network in terms of IP Addressing.
CO5	To trace the flow of a network packet over internet.
CO6	To design a network with subnets as specified.

Course: Elective-II (Embedded System)

Course Code: BTITC503A
L:P:T: 3:0:0
Exam Hours: 3
ESE Marks: 60

Credits: 3
CIE Marks(MSE+CA1+CA2): 40
Total Theory Hours: 36

Course Outcomes: At the end of the course, student will be able to:

CO1	To demonstrate & explain embedded systems hardware & software components.
CO2	To define embedded systems using real time operating system – VxWorks/ μCOS II RTOS.
CO3	To design & develop embedded applications using C language
CO4	To apply design techniques in real-life application

Course: Elective-II (IT Service Management)

Course Code: BTITC503B
L:P:T: 3:0:0
Exam Hours: 3
ESE Marks: 60

Credits: 3
CIE Marks(MSE+CA1+CA2): 40
Total Theory Hours: 36

Course Outcomes: At the end of the course, student will be able to:

CO1	To introduce practical implementation of Information Technology Service Management (ITSM).
CO2	To understand how an integrated ITSM framework can be utilized to achieve IT business integration, cost reductions and increased productivity.
CO3	To learn the best practices of ITSM methodology.

Course: Elective-II (Information Storage Management)

Course Code: BTITC503C
L:P:T: 3:0:0
Exam Hours: 3
ESE Marks: 60

Credits: 3
CIE Marks(MSE+CA1+CA2): 40
Total Theory Hours: 36

Course Outcomes: At the end of the course, student will be able to:

CO1	To describe and apply storage technologies
CO2	To identify leading Storage Technologies that provides cost-effective IT solutions for medium to large scale businesses and data centers.
CO3	To describe important Storage Technologies' features such as availability, replication, scalability and performance
CO5	To design, analyze and manage clusters of resources.

Course: Elective-II (Network Management)

Course Code: BTITC503D
L:P:T: 3:0:0
Exam Hours: 3
ESE Marks: 60

Credits: 4
CIE Marks(MSE+CA1+CA2): 40
Total Theory Hours: 36

Course Outcomes: At the end of the course, student will be able to:

CO1	To acquire the knowledge about network management standards (OSI and TCP/IP).
CO2	To acquire the knowledge about various network management tools and the skill to use them in monitoring a network.
CO3	To analyze the challenges faced by Network Managers
CO4	To evaluate various commercial Network Management Systems and Open Network Management Systems
CO5	To analyze and interpret the data provided by an NMS and take suitable actions

Course: Elective-II(Data Visualization)

Course Code: BTITC503E
L:P:T: 3:0:0
Exam Hours: 3
ESE Marks: 60

Credits: 3
CIE Marks(MSE+CA1+CA2): 40
Total Theory Hours: 36

Course Outcomes: At the end of the course, student will be able to:

CO1	1. To list out various stages of the data visualization.
CO2	To identify/choose suitable data for the specific data visualization problem
CO3	To plot useful plots/charts for data visualization problem under consideration
CO4	To interpret the finding from different types of charts/graphs
CO5	To select the right graph/chart to review datasets.

Course: Elective-II(Virtual Reality)

Course Code: BTITC503F
L:P:T: 3:0:0
Exam Hours: 3
ESE Marks: 60

Credits: 3
CIE Marks(MSE+CA1+CA2): 40
Total Theory Hours: 36

Course Outcomes: At the end of the course, student will be able to:

CO1	To understand geometric modeling and Virtual environment.
CO2	To study about Virtual Hardware and Software.
CO3	To develop Virtual Reality applications.

Course: Elective-III (Theory of Computation)

Course Code: BTITC504A
L:P:T: 3:0:0
Exam Hours: 3
ESE Marks: 60

Credits: 3
CIE Marks(MSE+CA1+CA2): 40
Total Theory Hours: 36

Course Outcomes: At the end of the course, student will be able to:

CO1	To construct finite state machines to solve problems in computing.
CO2	To write mathematical expressions for the formal languages.
CO3	To apply well defined rules for syntax verification
CO4	To construct and analyse Push down Automata and Turing Machine for formal languages
CO5	To express the understanding of the decidability and decidability problems.
CO6	To express the understanding of computational complexity

Course: Elective-III (Graph Theory)

Course Code: BTITC504B
L:P:T: 3:0:0
Exam Hours: 3
ESE Marks: 60

Credits: 3
CIE Marks(MSE+CA1+CA2): 40
Total Theory Hours: 36

Course Outcomes: At the end of the course, student will be able to:

CO1	To understand and apply the fundamental concepts in graph theory.
CO2	To apply graph theory based tools in solving practical problems.
CO3	To improve the proof writing skills

Course: Elective-III (Programming in Java)

Course Code: BTITC504C
L:P:T: 3:0:0
Exam Hours: 3
ESE Marks: 60

Credits: 3
CIE Marks(MSE+CA1+CA2): 40
Total Theory Hours: 36

Course Outcomes: At the end of the course, student will be able to:

CO1	To know the structure and model of the Java programming language
CO2	To use the Java programming language for various programming technologies.
CO3	To develop software in the Java programming language (application).

Course: Elective-III (Human Computer Interaction)

Course Code: BTITC504D
L:P:T: 3:0:0
Exam Hours: 3
ESE Marks: 60

Credits: 3
CIE Marks(MSE+CA1+CA2): 40
Total Theory Hours: 36

Course Outcomes: At the end of the course, student will be able to:

CO1	To describe and apply core theories, models and methodologies from the field of HCITo develop software in the Java programming language (application).
CO2	To describe what the user-centred design cycle is and explain how to practice this approach to design interactive software systems
CO3	To analyze the main features of interactive systems, and explain how to gauge the usability of digital environments, tools and interfaces

Course: Elective-III (Game Theory)

Course Code: BTITC505E
L:P:T: 3:0:0
Exam Hours: 3
ESE Marks: 60

Credits: 3
CIE Marks(MSE+CA1+CA2): 40
Total Theory Hours: 36

Course Outcomes: At the end of the course, student will be able to:

CO1	To solve problems using basic graph theory.
CO2	To identify induced sub graphs, cliques, matching's, covers in graphs.
CO3	To determine whether graphs are Hamiltonian and/or Eulerian
CO4	To solve problems involving vertex and edge coloring
CO5	To model real world problems using graph theory.

Course: Elective-III (3D Printing and Design)

Course Code: BTITC505F
L:P:T: 3:0:0
Exam Hours: 3
ESE Marks: 60

Credits: 3
CIE Marks(MSE+CA1+CA2): 40
Total Theory Hours: 36

Course Outcomes: At the end of the course, student will be able to:

CO1	To develop CAD models for 3D printing.
CO2	To import and Export CAD data and generate .stl file
CO3	To select a specific material for the given application.
CO4	To select a 3D printing process for an application
CO5	To produce a product using 3D Printing or Additive Manufacturing (AM)

Semester: VI

Course: Operating Systems

Course Code: BTITC601 Credits: 4
L:T:P: 3:1:0 CIE Marks(MSE+CA1+CA2): 40
Exam Hours: 3hrs Total Theory Hours: 36
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	To design various Scheduling algorithms.
CO2	To apply the principles of concurrency.
CO3	To design deadlock, prevention and avoidance algorithms.
CO4	To compare and contrast various memory management schemes.
CO5	To design and Implement a prototype file system.

Course: Database Management Systems

Course Code: BTITC602 Credits: 4
L:T:P: 3:1:0 CIE Marks(MSE+CA1+CA2): 40
Exam Hours: 3hrs Total Theory Hours: 36
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	To explain need of database management.
CO2	To design and implement a database schema for a given problem-domain.
CO3	To normalize a database.
CO4	To create and query a database using SQL DML/DDL commands, stored procedures and functions.
CO5	To declare and enforce integrity constraints on a database.
CO6	To illustrate understanding of indexing methods.

Course: Elective- IV (Software Testing)

Course Code: BTITPE603A
L:T:P: 3:0:0
Exam Hours: 3hrs
ESE Marks: 60

Credits: 3
CIE Marks(MSE+CA1+CA2): 40
Total Theory Hours: 36

Course Outcomes: At the end of the course, student will be able to:

CO1	To apply software testing knowledge and its processes to software applications.
CO2	To identify various software testing problems.
CO3	To solve software testing problems by designing and selecting software test models, criteria, strategies and methods.
CO4	To apply the techniques learned to improve the quality of software development.
CO5	To prepare a software quality plan for a software project.

Course: Elective- IV (Data Storage Technologies & Networks)

Course Code: BTITPE603B
L:T:P: 3:0:0
Exam Hours: 3hrs
ESE Marks: 60

Credits: 3
CIE Marks(MSE+CA1+CA2): 40
Total Theory Hours: 36

Course Outcomes: At the end of the course, student will be able to:

CO1	To explain the design of a data center and storage requirements.
CO2	To discuss the various types of storage and their properties.
CO3	To explain physical and virtualization of storage.
CO4	To explain the backup, archiving with regard to recovery and business continuity.

Course: Elective- IV (Service Oriented Architecture)

Course Code: BTITPE603C
L:T:P: 3:0:0
Exam Hours: 3hrs
ESE Marks: 60

Credits: 3
CIE Marks(MSE+CA1+CA2): 40
Total Theory Hours: 36

Course Outcomes: At the end of the course, student will be able to:

CO1	To build applications based on XML
CO2	To develop web services using technology elements.
CO3	To build SOA-based applications for intra-enterprise and inter-enterprise applications.

Course: Elective- IV (Network Programming)

Course Code: BTITPE603D
L:T:P: 3:0:0
Exam Hours: 3hrs
ESE Marks: 60

Credits: 3
CIE Marks(MSE+CA1+CA2): 40
Total Theory Hours: 36

Course Outcomes: At the end of the course, student will be able to:

CO1	To analyze the requirements of a networked programming environment and identify the issues to be solved.
CO2	To create conceptual solutions to those issues and implement a programming solution.
CO3	To understand the key protocols that supports the Internet.
CO4	To apply several common programming interfaces to network communication.
CO5	To understand the use of TCP/UDP Sockets.
CO6	To apply advanced programming techniques such as Broadcasting, Multicasting.

Course: Elective- IV (Data Warehousing and Data Mining)

Course Code: BTITPE603E
L:T:P: 3:0:0
Exam Hours: 3hrs
ESE Marks: 60

Credits: 3
CIE Marks(MSE+CA1+CA2): 40
Total Theory Hours: 36

Course Outcomes: At the end of the course, student will be able to:

CO1	To understand the functionality of the various Data Warehousing and Data Mining components.
CO2	To recognize the strengths and limitations of various Data Warehousing and Data Mining models.
CO3	To compare the various approaches to Data Warehousing and Data Mining implementations.
CO4	To describe and utilize a range of techniques for designing Data Warehousing and Data Mining systems for real-world applications.

Course: Elective- V (Compiler Design)

Course Code: BTITOE604A
L:T:P: 3:0:0
Exam Hours: 3hrs
ESE Marks: 60

Credits: 3
CIE Marks(MSE+CA1+CA2): 40
Total Theory Hours: 36

Course Outcomes: At the end of the course, student will be able to:

CO1	To understand the major concept areas of language translation and compiler design.
CO2	To develop an awareness of the function and complexity of compilers.
CO3	To identify the similarities and differences among various parsing techniques and grammar transformation techniques.

Course: Elective- V (Enterprise Resource Planning)

Course Code: BTITOE604B Credits: 3
L:T:P: 3:0:0 CIE Marks(MSE+CA1+CA2): 40
Exam Hours: 3hrs Total Theory Hours: 36
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	To demonstrate a good understanding of basic issues in Enterprise Systems.
CO2	To explain the scope of common Enterprise Systems (e.g., MM, SCM, CRM, HRM, procurement).
CO3	To explain the challenges associated with implementing enterprise systems and their impacts on organizations.
CO4	To describe the selection, acquisition and implementation of enterprise systems.
CO5	To use one of the popular ERP packages to support business operations and decision-making.
CO6	To communicate and assess an organization's readiness for enterprise system implementation with a professional approach in written form.
CO7	To demonstrate an ability to work independently and in a group.

Course: Elective- V (Decision Support Systems)

Course Code: BTITOE604C Credits: 3
L:T:P: 3:0:0 CIE Marks(MSE+CA1+CA2): 40
Exam Hours: 3hrs Total Theory Hours: 36
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	To recognize the relationship between business information needs and decision making.
CO2	To know the general nature and range of decision support systems.
CO3	To understand issues related to the development of DSS.
CO4	To select appropriate modeling techniques.
CO5	To analyze, design and implement a DSS.

Course: Elective- V (Software Project Management)

Course Code: BTITOE604D
L:T:P: 3:0:0
Exam Hours: 3hrs
ESE Marks: 60

Credits: 3
CIE Marks(MSE+CA1+CA2): 40
Total Theory Hours: 36

Course Outcomes: At the end of the course, student will be able to:

CO1	To apply the process to be followed in the software development life-cycle models.
CO2	To understand approaches for managing and optimizing the software development process.
CO3	To explain the quality management and different types of metrics used in software development.
CO4	To do the Project scheduling, Tracking, Risk Analysis, Quality Management and Project cost estimation using different techniques and tools.

Course: Elective- V (Introduction to Data Science)

Course Code: BTITOE604E
L:T:P: 3:0:0
Exam Hours: 3hrs
ESE Marks: 60

Credits: 3
CIE Marks(MSE+CA1+CA2): 40
Total Theory Hours: 36

Course Outcomes: At the end of the course, student will be able to:

CO1	To understand Data Science Process.
CO2	To understand the mathematical foundations needed for Data Science.
CO3	To collect, explore, clean, munge and manipulate data.
CO4	To implement models such as linear regression, decisiontrees, and clustering.
CO5	To build Data Science applications using Python based toolkits.

Semester: VII

Course: Cloud Computing and Storage Management

Course Code: BTITC701 Credits: 2
L:P:T:: 2:0:0 CIE Marks(MSE+CA1+CA2): 40
Exam Hours:3 Hours Total Theory Hours: 36
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	To understand the key dimensions of the challenge of Cloud Computing.
CO2	To assess the economics, financial and technological implications for selecting cloud computing for organization.
CO3	To describe and apply storage technologies.
CO4	To identify leading storage technologies that provide cost-effective IT solutions for medium to large scale businesses and data centers.
CO5	To describe important storage technology features such as availability, replication, scalability and performance.

Course: Artificial Intelligence

Course Code: BTITC702 Credits: 3
L:P:T:: 3:0:0 CIE Marks(MSE+CA1+CA2): 40
Exam Hours:3 Hours Total Theory Hours: 36
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	To find appropriate idealizations for converting real world problems into AI search problems formulated using the appropriate search algorithm.
CO2	To analyze, formalize and write algorithmic methods for search problems.
CO3	To explain important search concepts, the definitions of admissible and consistent heuristics and completeness and optimality
CO4	To implement and execute by hand alpha-beta search.
CO5	To design good evaluation functions and strategies for game playing.
CO6	To carry out proofs in first order and propositional logic using techniques such as resolution, unification, backward and forward chaining.
CO7	To choose and implement learning algorithms such as decision trees, support vector machines, and boosting.

Course: Elective VII (Pattern Recognition)

Course Code: BTITC703A Credits: 3

L:P:T:: 3:0:0 CIE Marks(MSE+CA1+CA2): 40
Exam Hours:3 Hours Total Theory Hours: 36
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	Identify and explain detailed aspects of internal structures of pattern recognitions.
CO2	Compare and contrast design issues for statistical pattern recognition.
CO3	Develop implementation skills for building pattern recognition.

Course: Elective VII (Soft Computing)

Course Code: BTITC703B Credits: 3

L:P:T:: 3:0:0 CIE Marks(MSE+CA1+CA2): 40
Exam Hours:3 Hours Total Theory Hours: 36
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	To use a new tool /tools to solve a wide variety of real world problems.
CO2	To find an alternate solution, more adaptable, resilient and optimum.
CO3	To apply knowledge of the soft computing domain to real world problems.

Course: Elective VII (Electronic Payment System)

Course Code: BTITC703C Credits: 3

L:P:T:: 3:0:0 CIE Marks(MSE+CA1+CA2): 40
Exam Hours:3 Hours Total Theory Hours: 36
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	To learn and speak Financial Services language.
CO2	To familiarize with banking regulations in the payment industry.
CO3	Gain domain knowledge for a careerin the financial industry: Banks, Insurance & NBFC.

Course: Elective VIII (Financial Accounting)

Course Code: BTITOE704B | Credits: 3

L:P:T:: 3:0:0 | CIE Marks(MSE+CA1+CA2): 40
Exam Hours:3 Hours | Total Theory Hours: 36
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	To demonstrate knowledge of machine learning literature
CO2	To describe how and why machine learning methods work.
CO3	To demonstrate results of parameter selection.
CO4	To explain relative strengths and weaknesses of different machine learning methods.
CO5	To select and apply appropriate machine learning methods to a selected problem.
CO6	To implement machine learning algorithms on real datasets.
CO7	To suggest ways to improve results.

Course: Elective VIII (Machine Learning)

Course Code: BTITOE704A | Credits: 3

L:P:T:: 3:0:0 | CIE Marks(MSE+CA1+CA2): 40
Exam Hours:3 Hours | Total Theory Hours: 36
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	Understand the basic accounting and financial terminology
CO2	Understand how events affect firm value.
CO3	Understand how financial transactions are recorded.
CO4	Make the participants' comfortable looking through financial statements

Course: Elective VIII (Deep Learning)

Course Code: BTITOE704C | Credits: 3

L:P:T:: 3:0:0 | CIE Marks(MSE+CA1+CA2): 40
Exam Hours:3 Hours | Total Theory Hours: 36
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	To learn about the building blocks used in these Deep Learning based solutions.
CO2	To learn about feedforward neural networks, convolutional neural networks, recurrent neural networks and attention mechanisms
CO3	To learn various optimization algorithms such as Gradient Descent, Nesterov Accelerated Gradient Descent, Adam, AdaGrad and RMSProp.
CO4	To learn to train deep neural networks.
CO5	To get the knowledge of deep architectures used for solving various Vision and NLP tasks

Course: Elective IX (Real Time Systems)

Course Code: BTITPE705A | Credits: 3

L:P:T:: 3:0:0 | CIE Marks(MSE+CA1+CA2): 40
Exam Hours:3 Hours | Total Theory Hours: 36
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	To characterize real-time systems and describe their functions.
CO2	To analyze, design and implement a real-time system
CO3	To apply formal methods to the analysis and design of real-time systems.
CO4	To apply formal methods for scheduling real-time systems.
CO5	To characterize and debug a real-time system.

Course: Elective IX (Information Security)

Course Code: BTITPE705B Credits: 3

L:P:T:: 3:0:0 CIE Marks(MSE+CA1+CA2): 40
Exam Hours:3 Hours Total Theory Hours: 36
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	To explain the challenges and scope of information security.
CO2	To explain security concepts as confidentiality, integrity and availability
CO3	To explain the importance of cryptographic algorithms used in information security
CO4	To identify and explain symmetric algorithms for encryption-based security of information.
CO5	To describe the access control mechanism used for user authentication and authorization.
CO6	To describe Secure Sockets Layer (SSL), Internet Protocol (IP) communications by using Internet Protocol Security (IPSec).
CO7	To explain the use of security tools as firewalls and intrusion prevention systems.
CO8	To explain malicious software issues introduced by software-based viruses and worms.
CO9	To describe the process of risk assessment in the context of IT security management.

Course: Elective IX (Management Information Systems)

Course Code: BTITPE705C Credits: 3

L:P:T:: 3:0:0 CIE Marks(MSE+CA1+CA2): 40
Exam Hours:3 Hours Total Theory Hours: 36
ESE Marks: 60

Course Outcomes: At the end of the course, student will be able to:

CO1	To understand the usage and constituents of MIS in organizations.
CO2	To understand the classifications, understanding and the different functionalities of these MIS.
CO3	To explain the functions and issues at each stage of system development.
CO4	To identify emerging trends in MIS technologies.
CO5	To identify and assess MIS in real-life organization.

Course : Elective IX Distributed Computing

Course Code: BTITPE705D
L:P:T: 3:0:0
Exam Hours: 3 Hours
ESE Marks: 60

Credits: 3
CIE Marks(MSE+CAI+CAII): 40
Total Theory Hours: 36

Course Outcomes: : After learning the course, the students should be able

CO1	To identify the core concepts of distributed systems.
CO2	To learn orchestration of multiple machines to correctly solve problems in an efficient, reliable and scalable way.
CO3	To examine concepts of distributed systems in designing large systems.
CO4	To apply distributed computing concepts to develop sample systems.

Course: Elective IX Natural Language Processing

Course Code: BTITPE705E
L:P:T: 3:0:0
Exam Hours: 3 Hours
ESE Marks: 60

Credits: 3
CIE Marks(MSE+CAI+CAII): 40
Total Theory Hours: 36

Course Outcomes: : After learning the course, the students should be able

CO1	To understand the models, methods and algorithms of statistical Natural Language Processing.
CO2	To implement probabilistic models in code, estimate parameters for such models and run meaningful experiments to validate such models.
CO3	To apply core computer science concepts and algorithms, such as dynamic programming.
CO4	To understand linguistic phenomena and explore the linguistic features relevant to each NLP task.
CO5	To identify opportunities and conduct research in NLP.
CO6	To analyze experimental results and write reports.

2.6.1 – COURSE OUTCOMES FOR ALL COURSES

Program: Electrical Engineering

Academic Year: 2018-2019

Class: SY

Semester: III and IV

SY EEP 2018-19

SEMESTER III

BTEEC 302. NETWORK ANALYSIS AND SYNTHESIS.
Teaching scheme:
Theory: 2 hrs
Tutorial: 1 hr
Total credit: 3
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Pre requisite	*Basic electrical engineering*
CourseOutcome	*To review basic components of electric network.To design and develop network equations and their solutions. To apply Laplace theorem for electric network analyses To analyze AC circuit*

BTEEC 303. FLUID MECHANICS AND THERMAL ENGINEERING.
Teaching scheme:
Theory: 2 hrs
Tutorial: 1hr
Total credit: 3
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Pre requisite	*Basic Mechanical engineering*
CourseOutcome	*To introduce properties of fluid and hydraulic measurement To understand dynamics of fluid flow To understand basic concepts of IC engines To understand concept of refrigeration and air conditioning*

BTEEC 304 MEASUREMENT AND INSTRUMENTATION
Teaching scheme:
Theory: 2 hrs
Tutorial: 1 hr
Total credit: 3
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Pre requisite	*Basic electrical engineering*
CourseOutcome	*To understand philosophy of measurement.To understand different methods analog and digital measurement.To study principle of construction and operation of different transducer and dismay methods.*

BTHM3401 - Basic Human Rights

Teaching scheme: Examination Scheme:
Theory: 2 hrs
Total credit: Audit Continuous Assessment: 50 Marks

Pre requisite	
CourseObjective	
CourseOutcome	*To study concept of time value of moneyTo study about demand in detailTo understand Meaning of Production and factors of production, To understand dif. Concept about market*

BTHM306. ENGINEERING ECONOMICS
Teaching scheme:
Theory: 2 hrs
Total credit: 2
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Pre requisite	
CourseOutcome	*To study concept of time value of money To study about demand in detail To understand Meaning of Production and factors of production, To understand dif. Concept about market*

BTEEE 305A . ELECTRICAL ENGINEERING MATERIALS.
Teaching scheme:
Theory: 3 hrs
Total credit: 3
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Pre requisite	*Basic electrical engineering, Physics, Chemistry*
CourseOutcome	*To study about crystal structureTo understand magnetic material structureTo study about conducting and superconducting materials To study dielectric and nano materials.*

BTEEE305C. SIGNALS AND SYSTEMS

Teaching scheme:
Theory: 3 hrs
Total credit: 3
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Pre requisite	*Basic electrical engineering*
CourseOutcome	*To study classification of signals and system To analyze diff. types of time signal*

SEMESTER IV

BTEEC 401. ELECTRICAL MACHINES – I
Teaching scheme:
Theory: 3 hrs
Tutorial: 1 hr
Total credit: 4
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Pre requisite	*Basic electrical technology,*
Course Outcome	*To study diff. types, construction and operating principle of diff. types of electrical machine*

BTEEC 403 ELECTRICAL INSTALLATION AND ESTIMATION
Teaching scheme:
Theory: 2 hrs
Tutorial-1hr
Total credit: 3
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Pre requisite	*Basic electrical engineering, electrical measurement and instrumentation.*
CourseOutcome	*To prepare estimates and costing of electrical installations of power system, To understand procedures of contracting and purchase.*

BTEEC404. NUMERICAL METHODS AND PROGRAMMING.
Teaching scheme:
Theory: 2 hrs
Tutorial-1hr
Total credit: 3

Examination Scheme:

Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Pre requisite	*Mathematics 1, mathematics 2, mathematics 3, C programming*
CourseOutcome	*To study and understand MATLAB programming.To review mathematical concepts .To develop computer program for linear and nonlinear equations.*

Product Design Engineering

Teaching Scheme:	Examination Scheme:
Lecture-cum-demonstration: 1 hr/week *Design Studio: 2 hr/week*	*Continuous Assessment 1: 30 MarksContinuous Assessment 2: 30 MarksFinal Assessment: 40 Marks*

Course Outcomes*: At the end of the course, students will be able to*

1. Create simple mechanical or other designs

2. Create design documents for knowledge sharing

3. Manage own work to meet design requirements

4. Work effectively with colleagues

BTEEE406A. SOLID STATE DEVICES.

Teaching scheme:

Theory: 2 hrs

Total credit: 2

Examination Scheme:

Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Pre requisite	*basic electrical engineering,*
CourseOutcome	*1. To study construction and characteristics of solid state devices.2. To apply operational amplifier models in circuits employing negative feedback.3. To design electronics circuit using Timer IC and voltage regulators.4. To perform analysis of amplifiers using small signal models for the circuit elements.5. To calculate the frequency response of circuits containing BJT, Op-Amp etc*

2.6.1 – COURSE OUTCOMES FOR ALL COURSES

Program: Electrical Engineering
Academic Year: 2018-2019
Class: TY
Semester: V and VI

Semester V and VI

EE301. POWER SYSTEM ENGINEERING

Teaching Scheme	**L: 04**	**T: 00**	**P: 00**
Evaluation Scheme	**ESE**	**MSE**	**Minimum Passing Marks**
	80 Marks	**20 Marks**	**40%**

Course Outcomes:
After completing this course student will have-

1. Ability to model and represent power system components
2. Ability to use software development tools to simulate and analyze the system
3. Ability to implement corrective measure for immediate as well as long term solution to the system problems

EE302. ELECTRICAL MACHINE DESIGN

Teaching Scheme	**L: 04**	**T: 00**	**P: 00**
Evaluation Scheme	**ESE**	**MSE**	**Minimum Passing Marks**
	80 Marks	**20 Marks**	**40%**

Course Outcomes :

1. Student will be able to understand significance of electrical machine design and components.
2. An ability to design a system, a component to meet desired needs, differentiate and will be able to compare different options based on results, and able to analyze and interpret results for different industrial application to meet desired needs within realistic constraints and confirms manufacture ability.
3. Students will build an ability to identify, formulate and solve industrial problems related to machine and equipment design problems.
4. With the basic knowledge of the machines, equipment's design and course, students will be able to develop computer programs for the utility and machine design techniques.
5. Students will understand broad education necessary to understand the impact of electrical machine design solutions in a global and economical context.

EE303. CONTROL SYSTEM I

Teaching Scheme	**L: 03**	**T: 01**	**P: 00**
Evaluation Scheme	**ESE**	**MSE**	**Minimum Passing Marks**
	80 Marks	**20 Marks**	**40%**

Course Outcome:

Students will be able to analyze and represent the control system mathematically.
Students will be able to analyze the control system in time and frequency domain.

EE304. MICROCONTROLLER AND MICROPROCESSORS

Teaching Scheme	**L: 03**	**T: 01**	**P: 00**
Evaluation Scheme	**ESE**	**MSE**	**Minimum Passing Marks**
	80 Marks	**20 Marks**	**40%**

Course outcome:

Upon successful completion of this course, a student should be able :

1. To Understand the basic architecture of 8051 and 8086.
2. To understand the basic programming used in microcontroller and microprocessor based systems.
3. To implement any system using microcontrollers and processors.
4. To understand coprocessor 8087 and some high end processors.
5. To develop interfacing to real world devices.

1. The Intel Microprocessors: 8086/8088, 80186, 80286, 80386 & 80486, Bary B.Brey, Prentice Hall, India 1996.
2. The Pentium Microprocessor-James L.Antonakos

EE305. Signals and Systems

Teaching Scheme	**L: 03**	**T: 01**	**P: 00**
Evaluation Scheme	**ESE**	**MSE**	**Minimum Passing Marks**
	80 Marks	**20 Marks**	**40%**

Course outcome:

Upon successful completion of this course, a student should be able to:

1. Be able to classify systems based on their properties: in particular, to understand and exploit the implications of linearity, time-invariance, causality, memory, and bounded-input, bounded-out (BIBO) stability
2. Determine Fourier transforms for continuous-time and discrete-time signals (or impulse-response functions), and understand how to interpret and plot Fourier transform magnitude and phase functions.
3. Understand the need to define two new transforms—the Laplace and Z transforms—to treat a class of signals broader than what the Fourier transform can handle.
4. Understand the relationships among the various representations of LTI systems—linear constant-coefficient difference or differential equation, frequency response, transfer function, and impulse response—and infer one representation from another (e.g., determine the impulse response from the difference equation, etc.).
5. Understand the properties, as well the analysis and design implications, of interconnections of LTI systems—parallel, series (cascade), and feedback—in the time and transform domains.

EE306. ELECTRICAL MACHINE DESIGN LAB

Teaching Scheme	**L: 00**	**T: 00**	**P: 02**
Evaluation Scheme	**CE**	**POE**	**Minimum Passing Marks**
	30 Marks	**70 Marks**	**40%**

EE307. CONTROL SYSTEM-I LAB

Teaching Scheme	**L: 00**	**T: 00**	**P: 02**
Evaluation Scheme	**CE**	**POE**	**Minimum Passing Marks**
	30 Marks	**70 Marks**	**40%**

EE308. MICROCONTROLLERS AND MICROPROCESSORS LAB

Teaching Scheme	**L: 00**	**T: 00**	**P: 02**
Evaluation Scheme	**CE**	**POE**	**Minimum Passing Marks**
	30 Marks	**70 Marks**	**40%**

EE309. BASIC SIMULATION LABORATORY

Teaching Scheme	**L: 00**	**T: 00**	**P: 02**
Evaluation Scheme	**CE**	**POE**	**Minimum Passing Marks**
	30 Marks	**70 Marks**	**40%**

Course Objectives:

1. To study the Simulink toolboxes and special toolboxes.
2. To get introduce with PSPICE software and simulation based on it.

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EE310. ELECTROMAGNETIC FIELDS

Teaching Scheme	**L: 03**	**T: 01**	**P: 00**
Evaluation Scheme	**ESE**	**MSE**	**Minimum Passing Marks**
	80 Marks	**20 Marks**	**40%**

Course outcomes:

1. 1.Ability to understand and apply basic science, circuit theory, Electro-magnetic field theory control theory and apply them to electrical engineering problems.

EE311. POWER SYSTEM ANALYSIS

Teaching Scheme	**L: 04**	**T: 00**	**P: 00**
Evaluation Scheme	**ESE**	**MSE**	**Minimum Passing Marks**
	80 Marks	**20 Marks**	**40%**

Course Outcomes:

After completing of this course, student will be able to:

1. Use the models of power system components and analyze them.
2. Compute various electrical parameters of power system under various fault conditions.
3. Carry out the stability studies for a single machine infinite bus system.

EE3012. CONTROL SYSTEM-II

Teaching Scheme	**L: 03**	**T: 01**	**P: 00**
Evaluation Scheme	**ESE**	**MSE**	**Minimum Passing Marks**
	80 Marks	**20 Marks**	**40%**

Course Outcome:

1. Students will be able to design the controller in time and frequency domain.
2. Students will be able to analyze and design the control system in modern approach.
3. Students will be able to analyze the non linear control system
4. Students will be able to analyze the discrete time control system.

EE313. POWER ELECTRONICS

Teaching Scheme	**L: 04**	**T: 00**	**P: 00**
Evaluation Scheme	**ESE**	**MSE**	**Minimum Passing Marks**
	80 Marks	**20 Marks**	**40%**

Course outcome:

Upon successful completion of this course, a student should be able to:

1. Understand the fundamental principles and applications of power electronics circuits
2. Solve problems and design switching regulators according to specifications.
3. Use Computer-aided techniques for the design of power converter circuits.
4. Appreciate the latest developments in power electronics.
5. Assimilate new technological and development in related field

EE314. ELECTRICAL ESTIMATION & ELECTRICAL UTILIZATION

Teaching Scheme	**L: 03**	**T: 01**	**P: 00**
Evaluation Scheme	**ESE**	**MSE**	**Minimum Passing Marks**
	80 Marks	**20 Marks**	**40%**

Course Outcomes:

1. To develop ability amongst the students to design heating element for resistance furnaces and design-illumination schemes. To develop ability amongst the students to analyze the Performance of arc furnaces, electric traction, different sources of light, illumination schemes, electric traction.
2. Students will understand domestic installation service connection and calculation of number of different materials in the form of an estimate.
3. Students will develop self and lifelong learning skills, introduce professionalism for successful career.

EE315. POWER SYSTEM-II LAB

Teaching Scheme	**L: 00**	**T: 00**	**P: 02**
Evaluation Scheme	**CE**	**POE**	**Minimum Passing Marks**
	30 Marks	**70 Marks**	**40%**

EE316. CONTROL SYSTEM-II LAB

Teaching Scheme	**L: 00**	**T: 00**	**P: 02**
Evaluation Scheme	**CE**	**POE**	**Minimum Passing Marks**
	30 Marks	**70 Marks**	**40%**

EE317. POWER ELECTRONICS LAB

Teaching Scheme	**L: 00**	**T: 00**	**P: 02**
Evaluation Scheme	**CE**	**POE**	**Minimum Passing Marks**
	30 Marks	**70 Marks**	**40%**

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EE318. SEMINAR

Teaching Scheme	**L: 00**	**T: 00**	**P: 02**
Evaluation Scheme	**CE**	**POE**	**Minimum Passing Marks**
	100 Marks	**00 Marks**	**40%**

2.6.1 – COURSE OUTCOMES FOR ALL COURSES

Program: Electrical Engineering
Academic Year: 2018-2019
Class: BE
Semester: VII and VIII

EE401. Industrial Management & Economics

Teaching Scheme	**L: 04**	**T: 00**	**P: 00**
Evaluation Scheme	**ESE**	**MSE**	**Minimum Passing Marks**
	80 Marks	**20 Marks**	**40%**

Course Outcomes:

After completing this course student will have-

1. An ability to function on multidisciplinary teams
2. An ability to identify, formulate, and solve engineering problems
3. An understanding of professional and ethical responsibility
4. An ability to communicate effectively
5. The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
6. A recognition of the need for, and an ability to engage in life-long learning
7. A knowledge of contemporary issues
8. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

EE405 Elective-I (D) Generalised Theory of Electrical Machines

Teaching Scheme	**L: 04**	**T: 00**	**P: 00**
Evaluation Scheme	**ESE**	**MSE**	**Minimum Passing Marks**
	80 Marks	**20 Marks**	**40%**

Learning Outcomes:

Students will be able to

1. Reproduce principal of operation of PMSM, Stepper motor, SRM, Switch reluctance and

linear motors.
2. Develop torque speed and performance characteristics of above motors.
3. Enlist application of these motors.
4. Demonstrate various control strategies.

EE407. Power System Operation and Control Lab

Teaching Scheme	**L: 00**	**T: 00**	**P: 02**
Evaluation Scheme	**CE**	**POE**	**Minimum Passing Marks**
	30 Marks	**70 Marks**	**40%**

Course Outcomes:

After completing this course student will be able to -

1. Understand the operations of different FACTS devices.
2. Select the controllers for different Contingencies.
3. Analyze the different FACTS devices in different stability conditions.
4. Select an appropriate FACTS device for a particular application.
5. Understand the importance of Transmission power through HVDC.
6. Calculate power conversion between Ac to DC and DC to AC

EE414. Elective-II (D) Special Topics in Electrical Engineering

Teaching Scheme	**L: 04**	**T: 00**	**P: 00**
Evaluation Scheme	**ESE**	**MSE**	**Minimum Passing Marks**
	80 Marks	**20 Marks**	**40%**

Course Outcomes:

After completing this course student will have-

1. Describe the process of restructuring of power system.
2. Identify various operation of restructured power system.
3. Knowledge of power sector in India.
4. Learn the preparation of energy audit report & conservation in different electrical system.

2.6.1 – COURSE OUTCOMES FOR ALL COURSES

Program: Electrical Engineering

Academic Year: 2019-2020

Class: SY

Semester:III and IV

SY EEP 2019-20
SEMESTER III

BTEEC 302. NETWORK ANALYSIS AND SYNTHESIS.
Teaching scheme:
Theory: 2 hrs
Tutorial: 1 hr
Total credit: 3
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Pre requisite	*Basic electrical engineering*
CourseOutcome	*To review basic components of electric network.To design and develop network equations and their solutions. To apply Laplace theorem for electric network analyses To analyze AC circuit*

BTEEC 303. FLUID MECHANICS AND THERMAL ENGINEERING.
Teaching scheme:
Theory: 2 hrs
Tutorial: 1hr
Total credit: 3
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Pre requisite	*Basic Mechanical engineering*
CourseOutcome	*To introduce properties of fluid and hydraulic measurement To understand dynamics of fluid flow To understand basic concepts of IC engines To understand concept of refrigeration and air conditioning*

BTEEC 304 MEASUREMENT AND INSTRUMENTATION

Teaching scheme:
Theory: 2 hrs
Tutorial: 1 hr
Total credit: 3
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Pre requisite	*Basic electrical engineering*
CourseOutcome	*To understand philosophy of measurement.To understand different methods analog and digital measurement.To study principle of construction and operation of different transducer and dismay methods.*

BTHM3401 - Basic Human Rights
Teaching scheme: Examination Scheme:
Theory: 2 hrs
Total credit: Audit Continuous Assessment: 50 Marks

Pre requisite	
CourseObjective	
CourseOutcome	*To study concept of time value of moneyTo study about demand in detailTo understand Meaning of Production and factors of production, To understand dif. Concept about market*

BTHM306. ENGINEERING ECONOMICS
Teaching scheme:
Theory: 2 hrs
Total credit: 2
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Pre requisite	
CourseOutcome	*To study concept of time value of money To study about demand in detail To understand Meaning of Production and factors of production, To understand dif. Concept about market*

BTEEE 305A . ELECTRICAL ENGINEERING MATERIALS.
Teaching scheme:
Theory: 3 hrs
Total credit: 3
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Pre requisite	*Basic electrical engineering, Physics, Chemistry*
CourseOutcome	*To study about crystal structureTo understand magnetic material structureTo study about conducting and superconducting materials To study dielectric and nano materials.*

BTEEE305C. SIGNALS AND SYSTEMS
Teaching scheme:

Theory: 3 hrs
Total credit: 3
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Pre requisite	*Basic electrical engineering*
CourseOutcome	*To study classification of signals and system To analyze diff. types of time signal*

SEMESTER IV

BTEEC 401. ELECTRICAL MACHINES – I
Teaching scheme:
Theory: 3 hrs
Tutorial: 1 hr
Total credit: 4
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Pre requisite	*Basic electrical technology,*
Course Outcome	*To study diff. types, construction and operating principle of diff. types of electrical machine*

BTEEC 403 ELECTRICAL INSTALLATION AND ESTIMATION
Teaching scheme:
Theory: 2 hrs
Tutorial-1hr
Total credit: 3
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Pre requisite	*Basic electrical engineering, electrical measurement and instrumentation.*
CourseOutcome	*To prepare estimates and costing of electrical installations of power system, To understand procedures of contracting and purchase.*

BTEEC404. NUMERICAL METHODS AND PROGRAMMING.
Teaching scheme:
Theory: 2 hrs
Tutorial-1hr

Total credit: 3
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Pre requisite	*Mathematics 1, mathematics 2, mathematics 3, C programming*
CourseOutcome	*To study and understand MATLAB programming.To review mathematical concepts .To develop computer program for linear and nonlinear equations.*

Product Design Engineering

Teaching Scheme:	Examination Scheme:
Lecture-cum-demonstration: 1 hr/week *Design Studio: 2 hr/week*	*Continuous Assessment 1: 30 MarksContinuous Assessment 2: 30 MarksFinal Assessment: 40 Marks*

¬ *Pre-requisites: Knowledge of Basic Sciences, Mathematics and Engineering Drawing*
¬ *Design Studio : 2 hr/week to develop design sketching and practical skills, learning digital tools*
¬ *Continuous Assessment: Progress through a product design and documentation of steps in the selected product design*
¬ *Final Assessment: Product Design in Studio with final product specifications*
Course Outcomes*: At the end of the course, students will be able to*
1. Create simple mechanical or other designs
2. Create design documents for knowledge sharing
3. Manage own work to meet design requirements
4. Work effectively with colleagues

BTEEE406A. SOLID STATE DEVICES.
Teaching scheme:
Theory: 2 hrs
Total credit: 2
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Pre requisite	*basic electrical engineering,*
CourseOutcome	*1. To study construction and characteristics of solid state devices.2. To apply operational amplifier models in circuits employing negative feedback.3. To design electronics circuit using Timer IC and voltage regulators.4. To perform analysis of amplifiers using small signal models for the circuit elements.5. To calculate the frequency response of circuits containing BJT, Op-Amp etc*

2.6.1 – COURSE OUTCOMES FOR ALL COURSES

Program: Electrical Engineering

Academic Year: 2019-2020

Class: TY

Semester: V and VI

TY EEP 2019-20

Semester: V

BTEEC501: ELECTRICAL MACHINE-II Teaching scheme:
Theory: 3 hrs
Tutorial: 1 hr
Total credit: 4
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Prerequisite	*Electrical machine I*
Course outcome	*To study different methods of speed control of AC and DC motorTo study importance and procedure of different performance test on AC and DC motor. To determine different operating characteristics of AC and DC machines*

BTEEC502: POWER SYSTEM-II Teaching scheme:
Theory: 3 hrs
Tutorial: 1hr
Total credit: 4
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Prerequisite	*Power system I*
Course outcome	*To study different parameters of power system operation and control To study load flow and Diff. methods of reactive power control.To understand diff. methods of fault analysis and stability study*

BTEEC503-.MICROPROCESSOR AND MICRO CONTROLLER
Teaching scheme:
Theory: 3 hrs
Tutorial: 0 hr
Total credit: 3
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Prerequisite	*Digital electronics, electronics devices and circuits*
Course outcome	*To know the architecture of 8085 and 8051.To understand interfacing and interrupt features of 8085 and 8051. To develop program for basic applications.*

BTHM 504: VALUE EDUCATION, HUMAN RIGHTS AND LEGISLATIVE PROCEDURES
Teaching scheme:
Theory: 2 hrs
Total credit: 0 (Audit course)
Examination Scheme: *Mid-term test: -- Internal Assessment: -- End semester exam:---*

Prerequisite	*Human Values and engg ethics*
Course outcome	*To understand value of education and self-development To develop good values and characterTo know Human right and legislative procedure*

BTEEE 505 ELECTIVE- IV: 2. ADVANCES IN RENEWABLE ENERGY SYSTEMS
Teaching scheme:
Theory: 3 hrs
Total credit: 3
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Prerequisite	*Introduction to Non-Conventional energy sources*
Course outcome	*To know the principle of energy conversion technique from biomass, geothermal and hybrid energy systems.To understand effects of air pollution and ecosystems*

BTEEOE 506: ELECTIVE-V 2 POWER PLANT ENGINEERING. Teaching scheme:
Theory: 3 hrs
Total credit: 3
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Prerequisite	*Power system I, power system II, machine I and II*
Course outcome	*To review basic components of power system, energy sources.To understand principle of construction and operation of different conventional power plants*

Semester: VI

BTEEC 601. CONTROL SYSTEM Teaching scheme:
Theory: 3 hrs
Tutorial: 1 hr
Total credit: 4
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Prerequisite	*Control system I*
Course outcome	*To understand the behavior of nonlinear control system.To design and analyze PID controller.To understand and analyze state variable technique.To design and analyze suitable control system for engineering application*

BTEEC602 PRINCIPLES OF ELECTRICAL MACHINE DESIGN
Teaching scheme:
Theory: 3 hrs
Tutorial: 0 hr
Total credit: 3
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Prerequisite	*Machine I and II,*
Course outcome	*To understand principles of electric machine design. To design different components of electric machine. To design TransformerTo understand CAD and use it for transformer design*

BTEEC603 POWER ELECTRONICS
Teaching scheme:
Theory: 3 hrs
Tutorial: 1 hr
Total credit: 4
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Prerequisite	*Electronic Devices And Circuits*
Course outcome	*To review principle of construction, operation and characteristics of basic semiconductor devices.To understand and analyze performance of controlled and uncontrolled converters. To understand and analyze performance of DC to DC converters. Dc to AC converters. To understand and analyze performance of AC voltage controllers*

BTEEE604 : Elective-VI: 1. INDUSTRIAL AUTOMATION AND CONTROL

.

Prerequisite	*Control system I, industrial automation*
Course outcome	*To understand construction and working principle of different industrial measurement systems.To understand new trends in industrial process control.*

BTEEE605 ELECTIVE-VII 1. SWITCH GEAR AND PROTECTION Teaching scheme:

Theory: 3 hrs
Total credit: 3
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Prerequisite	*Power system I and II, control system I and II, machine I and II*
Course outcome	*To understand principles of protective relaying.To understand principle of construction, operation and selection of different type of circuit breaker used in power system.To understand different protection schemes used in power system operation*

BTEEOE606 ELECTIVE- VIII. 2. PROJECT MANAGEMENT Teaching scheme:
Theory: 3 hrs
Total credit: 3
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Prerequisite	*Communication skills.*
Course outcome	*To understand concepts of project management. To develop a project plan.To understand the project implementation strategy. To analyze post project affects*

2.6.1 – COURSE OUTCOMES FOR ALL COURSES

Program: Electrical Engineering
Academic Year: 2019-2020
Class: BE
Semester: VII and VIII

EE401. Industrial Management & Economics

Teaching Scheme	**L: 04**	**T: 00**	**P: 00**
Evaluation Scheme	**ESE**	**MSE**	**Minimum Passing Marks**
	80 Marks	**20 Marks**	**40%**

Course Outcomes:

After completing this course student will have-

1. An ability to function on multidisciplinary teams
2. An ability to identify, formulate, and solve engineering problems
3. An understanding of professional and ethical responsibility
4. An ability to communicate effectively
5. The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
6. A recognition of the need for, and an ability to engage in life-long learning
7. A knowledge of contemporary issues
8. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

EE405 Elective-I (D) Generalised Theory of Electrical Machines

Teaching Scheme	**L: 04**	**T: 00**	**P: 00**
Evaluation Scheme	**ESE**	**MSE**	**Minimum Passing Marks**
	80 Marks	**20 Marks**	**40%**

Learning Outcomes:

Students will be able to

1. Reproduce principal of operation of PMSM, Stepper motor, SRM, Switch reluctance and

linear motors.
2. Develop torque speed and performance characteristics of above motors.
3. Enlist application of these motors.
4. Demonstrate various control strategies.

EE407. Power System Operation and Control Lab

Teaching Scheme	**L: 00**	**T: 00**	**P: 02**
Evaluation Scheme	**CE**	**POE**	**Minimum Passing Marks**
	30 Marks	**70 Marks**	**40%**

Course Outcomes:

After completing this course student will be able to -

1. Understand the operations of different FACTS devices.
2. Select the controllers for different Contingencies.
3. Analyze the different FACTS devices in different stability conditions.
4. Select an appropriate FACTS device for a particular application.
5. Understand the importance of Transmission power through HVDC.
6. Calculate power conversion between Ac to DC and DC to AC

EE414. Elective-II (D) Special Topics in Electrical Engineering

Teaching Scheme	**L: 04**	**T: 00**	**P: 00**
Evaluation Scheme	**ESE**	**MSE**	**Minimum Passing Marks**
	80 Marks	**20 Marks**	**40%**

Course Outcomes:

After completing this course student will have-

1. Describe the process of restructuring of power system.
2. Identify various operation of restructured power system.
3. Knowledge of power sector in India.
4. Learn the preparation of energy audit report & conservation in different electrical system.

2.6.1 – COURSE OUTCOMES FOR ALL COURSES

Program: Electrical Engineering

Academic Year: 2020-21

Class: SY

Semester: III and IV

SY EEP 2020-21
Semester III

BTEEC 302. NETWORK ANALYSIS AND SYNTHESIS.
Teaching scheme:
Theory: 2 hrs
Tutorial: 1 hr
Total credit: 3
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Pre requisite	*Basic electrical engineering*
CourseOutcome	*To review basic components of electric network.To design and develop network equations and their solutions. To apply Laplace theorem for electric network analyses To analyze AC circuit*

BTEEC 303. FLUID MECHANICS AND THERMAL ENGINEERING.
Teaching scheme:
Theory: 2 hrs
Tutorial: 1hr
Total credit: 3
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Pre requisite	*Basic Mechanical engineering*
CourseOutcome	*To introduce properties of fluid and hydraulic measurement To understand dynamics of fluid flow To understand basic concepts of IC engines To understand concept of refrigeration and air conditioning*

BTEEC 304 MEASUREMENT AND INSTRUMENTATION
Teaching scheme:
Theory: 2 hrs
Tutorial: 1 hr
Total credit: 3

Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Pre requisite	*Basic electrical engineering*
CourseOutcome	*To understand philosophy of measurement.To understand different methods analog and digital measurement.To study principle of construction and operation of different transducer and dismay methods.*

BTHM3401 - Basic Human Rights
Teaching scheme: Examination Scheme:
Theory: 2 hrs
Total credit: Audit Continuous Assessment: 50 Marks

Pre requisite	
CourseObjective	
CourseOutcome	*To study concept of time value of moneyTo study about demand in detailTo understand Meaning of Production and factors of production, To understand dif. Concept about market*

BTHM306. ENGINEERING ECONOMICS
Teaching scheme:
Theory: 2 hrs
Total credit: 2
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Pre requisite	
CourseOutcome	*To study concept of time value of money To study about demand in detail To understand Meaning of Production and factors of production, To understand dif. Concept about market*

BTEEE 305A . ELECTRICAL ENGINEERING MATERIALS.
Teaching scheme:
Theory: 3 hrs
Total credit: 3
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Pre requisite	*Basic electrical engineering, Physics, Chemistry*
CourseOutcome	*To study about crystal structureTo understand magnetic material structureTo study about conducting and superconducting materials To study dielectric and nano materials.*

BTEEE305C. SIGNALS AND SYSTEMS
Teaching scheme:
Theory: 3 hrs
Total credit: 3
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Pre requisite	*Basic electrical engineering*
CourseOutcome	*To study classification of signals and system To analyze diff. types of time signal*

SEMESTER IV

BTEEC 401. ELECTRICAL MACHINES – I
Teaching scheme:
Theory: 3 hrs
Tutorial: 1 hr
Total credit: 4
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Pre requisite	*Basic electrical technology,*
Course Outcome	*To study diff. types, construction and operating principle of diff. types of electrical machine*

BTEEC 403 ELECTRICAL INSTALLATION AND ESTIMATION
Teaching scheme:
Theory: 2 hrs
Tutorial-1hr
Total credit: 3
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Pre requisite	*Basic electrical engineering, electrical measurement and instrumentation.*
CourseOutcome	*To prepare estimates and costing of electrical installations of power system, To understand procedures of contracting and purchase.*

BTEEC404. NUMERICAL METHODS AND PROGRAMMING.
Teaching scheme:
Theory: 2 hrs
Tutorial-1hr
Total credit: 3
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Pre requisite	*Mathematics 1, mathematics 2, mathematics 3, C programming*

CourseOutcome	*To study and understand MATLAB programming.To review mathematical concepts .To develop computer program for linear and nonlinear equations.*

Product Design Engineering

Teaching Scheme:	Examination Scheme:
Lecture-cum-demonstration: 1 hr/week Design Studio: 2 hr/week	*Continuous Assessment 1: 30 MarksContinuous Assessment 2: 30 MarksFinal Assessment: 40 Marks*

¬ *Pre-requisites: Knowledge of Basic Sciences, Mathematics and Engineering Drawing*
¬ *Design Studio : 2 hr/week to develop design sketching and practical skills, learning digital tools*
¬ *Continuous Assessment: Progress through a product design and documentation of steps in the selected product design*
¬ *Final Assessment: Product Design in Studio with final product specifications*
Course Outcomes*: At the end of the course, students will be able to*
1. Create simple mechanical or other designs
2. Create design documents for knowledge sharing
3. Manage own work to meet design requirements
4. Work effectively with colleagues

BTEEE406A. SOLID STATE DEVICES.
Teaching scheme:
Theory: 2 hrs
Total credit: 2
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Pre requisite	*basic electrical engineering,*
CourseOutcome	*1. To study construction and characteristics of solid state devices.2. To apply operational amplifier models in circuits employing negative feedback.3. To design electronics circuit using Timer IC and voltage regulators.4. To perform analysis of amplifiers using small signal models for the circuit elements.5. To calculate the frequency response of circuits containing BJT, Op-Amp etc*

2.6.1 – COURSE OUTCOMES FOR ALL COURSES

Program: Electrical Engineering

Academic Year: 2020-21

Class: TY

Semester: V and VI

TY EEP 2020-21

Semester: V
BTEEC501: ELECTRICAL MACHINE-II Teaching scheme:
Theory: 3 hrs
Tutorial: 1 hr
Total credit: 4
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Prerequisite	*Electrical machine I*
Course outcome	*To study different methods of speed control of AC and DC motorTo study importance and procedure of different performance test on AC and DC motor. To determine different operating characteristics of AC and DC machines*

BTEEC502: POWER SYSTEM-II Teaching scheme:
Theory: 3 hrs
Tutorial: 1hr
Total credit: 4
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Prerequisite	*Power system I*
Course outcome	*To study different parameters of power system operation and control To study load flow and Diff. methods of reactive power control.To understand diff. methods of fault analysis and stability study*

BTEEC503-.MICROPROCESSOR AND MICRO CONTROLLER
Teaching scheme:
Theory: 3 hrs
Tutorial: 0 hr
Total credit: 3
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Prerequisite	*Digital electronics, electronics devices and circuits*
Course outcome	*To know the architecture of 8085 and 8051.To understand interfacing and interrupt features of 8085 and 8051. To develop program for basic applications.*

BTHM 504: VALUE EDUCATION, HUMAN RIGHTS AND LEGISLATIVE PROCEDURES
Teaching scheme:
Theory: 2 hrs
Total credit: 0 (Audit course)
Examination Scheme: *Mid-term test: -- Internal Assessment: -- End semester exam:---*

Prerequisite	*Human Values and engg ethics*
Course outcome	*To understand value of education and self-development To develop good values and characterTo know Human right and legislative procedure*

BTEEE 505 ELECTIVE- IV: 2. ADVANCES IN RENEWABLE ENERGY SYSTEMS
Teaching scheme:
Theory: 3 hrs
Total credit: 3
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Prerequisite	*Introduction to Non-Conventional energy sources*
Course outcome	*To know the principle of energy conversion technique from biomass, geothermal and hybrid energy systems.To understand effects of air pollution and ecosystems*

BTEEOE 506: ELECTIVE-V 2 POWER PLANT ENGINEERING. Teaching scheme:
Theory: 3 hrs
Total credit: 3
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Prerequisite	*Power system I, power system II, machine I and II*
Course outcome	*To review basic components of power system, energy sources.To understand principle of construction and operation of different conventional power plants*

Semester: VI

BTEEC 601. CONTROL SYSTEM Teaching scheme:
Theory: 3 hrs
Tutorial: 1 hr
Total credit: 4
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Prerequisite	*Control system I*
Course outcome	*To understand the behavior of nonlinear control system.To design and analyze PID controller.To understand and analyze state variable technique.To design and analyze suitable control system for engineering application*

BTEEC602 PRINCIPLES OF ELECTRICAL MACHINE DESIGN
Teaching scheme:
Theory: 3 hrs
Tutorial: 0 hr
Total credit: 3
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Prerequisite	*Machine I and II,*
Course outcome	*To understand principles of electric machine design. To design different components of electric machine. To design TransformerTo understand CAD and use it for transformer design*

BTEEC603 POWER ELECTRONICS
Teaching scheme:
Theory: 3 hrs
Tutorial: 1 hr
Total credit: 4

Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Prerequisite	*Electronic Devices And Circuits*
Course outcome	*To review principle of construction, operation and characteristics of basic semiconductor devices.To understand and analyze performance of controlled and uncontrolled converters. To understand and analyze performance of DC to DC converters. Dc to AC converters. To understand and analyze performance of AC voltage controllers*

BTEEE604 : Elective-VI: 1. INDUSTRIAL AUTOMATION AND CONTROL

.

Prerequisite	*Control system I, industrial automation*
Course outcome	*To understand construction and working principle of different industrial measurement systems.To understand new trends in industrial process control.*

BTEEE605 ELECTIVE-VII 1. SWITCH GEAR AND PROTECTION Teaching scheme:
Theory: 3 hrs
Total credit: 3
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Prerequisite	*Power system I and II, control system I and II, machine I and II*
Course outcome	*To understand principles of protective relaying.To understand principle of construction, operation and selection of different type of circuit breaker used in power system.To understand different protection schemes used in power system operation*

BTEEOE606 ELECTIVE- VIII. 2. PROJECT MANAGEMENT Teaching scheme:
Theory: 3 hrs
Total credit: 3
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Prerequisite	*Communication skills.*
Course outcome	*To understand concepts of project management. To develop a project plan.To understand the project implementation strategy. To analyze post project affects*

2.6.1 – COURSE OUTCOMES FOR ALL COURSES

Program: Electrical Engineering
Academic Year: 2020-2021
Class: BE
Semester: VII and VIII

SEMESTER VII

BTEEC701: POWER SYSTEM OPERATION AND CONTROL	
Teaching Scheme:	Examination Scheme:
Theory: 3hr	Mid-term Test: 20 Marks
Tutorial: 0	Internal Assessment: 20 Marks
Total Credits: 3	End Term Exam: 60 Marks

Course Outcome:

1. Explain the fundamental concept of power system.
2. Design the mathematical model of synchronous machine.
3. Design the mathematical model Excitation system and speed governing system.
4. Analyze the transient stability of power system using swing equation and equal area criteria.
5. Analyze the economic operation of power system.
6. Explain the methods of Voltage control.

BTEEC702: HIGH VOLTAGE ENGINEERING	
Teaching Scheme:	Examination Scheme:
Theory: 3hr	Mid-term Test: 20 Marks
Tutorial: 0	Internal Assessment: 20 Marks
Total Credits: 3	End Term Exam: 60 Marks

Course Outcomes:

1. Illustrate the concept of electric field stresses, applications of insulating materials and methods for Non-destructive testing of equipment like transformers, insulators, isolators, bushings, lightning arrestors, cables, circuit breakers and surge diverters.
2. Explain the breakdown process in solid, liquid, and gaseous materials
3. Analyze methods for generation and measurement of High Voltages and Currents (both ac and dc)
4. Describe the phenomenon of over-voltage and choose appropriate insulation co-ordination levels based on IS & IEC Standards.

BTEEC703: ELECTRICAL DRIVES	
Teaching Scheme:	Examination Scheme:
Theory: 3hr	Mid-term Test: 20 Marks
Tutorial: 0	Internal Assessment: 20 Marks
Total Credits: 3	End Term Exam: 60 Marks

Course outcomes:

Analyze the dynamics of Electrical Drives system.
Use various control techniques for controlling the speed of AC and DC motors.
Analyze the AC and DC drives.
To Select/recommend the appropriate Drive according to the particular applications.
State the recent technology of AC and DC drive

BTEEE704B: ELECTRIC TRACTION & UTILIZATION	
Teaching Scheme:	Examination Scheme:
Theory: 3hr	Mid-term Test: 20 Marks
Tutorial:	Internal Assessment: 20 Marks
Total Credits:3	End Term Exam: 60 Marks

Course Outcomes:

After Completion of this Course, student will be able to

1. Identify types of Traction System.
2. Interprete Various Power supply in Electric Traction.
3. Analyze Various Traction Motors.
4. Define methods of Traction motor Control.
5. Elobrate Train movement & Breaking in Traction system.
6. Classify the indoor and outdoor Illumination system.

BTEEE705C: ELECTRICAL POWER QUALITY	
Teaching Scheme:	Examination Scheme:
Theory: 3hr	Mid-term Test: 20 Marks
Tutorial:	Internal Assessment: 20 Marks

Total Credits:3	End Term Exam: 60 Marks

Course Outcome:

After Completion of this Course….

1. Student will be able to get the in-depth understanding of power quality issues & standards.
2. Students will be able to understand working of power quality improving Equipment's.

BTEEL708: ELECTRICAL DRIVES LAB	
Teaching Scheme:	Examination Scheme:
Practical: 2hr	Continuous Assessment: 30 Marks
Total Credits: 1	End Term Exam: 20 Marks

BTEES709: SEMINAR	
Teaching Scheme:	Examination Scheme:
Practical: 2hr	Continuous Assessment: 30 Marks
Total Credits: 1	End Term Exam: 20 Marks

BTEEP710: PROJECT PART-I	
Teaching Scheme:	Examination Scheme:
Practical: 6hr	Continuous Assessment: 30 Marks
Total Credits: 3	End Term Exam: 20 Marks

BTEEF711: FIELD TRAINING/INTERNSHIP/INDUSTRIAL TRAINING III	
Teaching Scheme:	Examination Scheme:
Practical: --	Continuous Assessment: --
Total Credits: 1	End Term Exam: 50 Marks

SEMESTER VIII

DC POWER TRANSMISSION SYSTEM	
Teaching Scheme:	Examination Scheme:
Theory: 03	Mid-term Test: 20* Marks
Tutorial: 00	Internal Assessment: 20* Marks
Total Credits: 3	End Term Exam: 60* Marks

Course Outline:

This course gives an introduction to the DC power transmission system using the conventional line commutated converters. The topics covered include a detailed analysis of the 6 pulse line commutated converter (LCC), 12 pulse LCC, capacitor commutated converter, DC link control, and design of single tuned filter.

ENTREPRENEURSHIP ESSENTIALS	
Teaching Scheme:	Examination Scheme:
Theory: 3hr	Mid-term Test: 20* Marks
	Internal Assessment: 20* Marks
Total Credits: 3	End Term Exam: 60* Marks

CourseOutline:

The course provides foundational knowledge on various aspects of entrepreneurial venture creation and management during its life-cycle. It has been designed to address multidisciplinary audiences. The objective of the course is to teach key issues faced by entrepreneurs and managers at different stages of the life-cycle of an enterprise and is relevant both for aspiring entrepreneurs and for decision makers in established enterprises. Topics can be classified in some major themes such as : Making a choice to create an entrepreneurial venture, current trend of technology entrepreneurship, how to start a start-up, identifying opportunities, factors driving competitive advantages, organizational structure, basic knowledge of financial statements and project report,introductory knowledge on marketing management, human resource management, & strategic management, risk analysis, legal aspect of business, how to raise fund during life-cycle of a new ventures.

BTEEP803: PROJECT-II	
Teaching Scheme:	Examination Scheme:
Practical: 30hr	Continuous Assessment: 100 Marks

Total Credits: 15	End Term Exam: 150 Marks

2.6.1 – COURSE OUTCOMES FOR ALL COURSES

Program: Electrical Engineering

Academic Year: 2021-22

Class: TY

Semester: V and VI

TY EEP 2021-22

Semester: V
BTEEC501: ELECTRICAL MACHINE-II Teaching scheme:
Theory: 3 hrs
Tutorial: 1 hr
Total credit: 4
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Prerequisite	*Electrical machine I*
Course outcome	*To study different methods of speed control of AC and DC motorTo study importance and procedure of different performance test on AC and DC motor. To determine different operating characteristics of AC and DC machines*

BTEEC502: POWER SYSTEM-II Teaching scheme:
Theory: 3 hrs
Tutorial: 1hr
Total credit: 4
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Prerequisite	*Power system I*
Course outcome	*To study different parameters of power system operation and control To study load flow and Diff. methods of reactive power control.To understand diff. methods of fault analysis and stability study*

BTEEC503-.MICROPROCESSOR AND MICRO CONTROLLER
Teaching scheme:
Theory: 3 hrs
Tutorial: 0 hr
Total credit: 3
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Prerequisite	*Digital electronics, electronics devices and circuits*
Course outcome	*To know the architecture of 8085 and 8051.To understand interfacing and interrupt features of 8085 and 8051. To develop program for basic applications.*

BTHM 504: VALUE EDUCATION, HUMAN RIGHTS AND LEGISLATIVE PROCEDURES
Teaching scheme:
Theory: 2 hrs
Total credit: 0 (Audit course)
Examination Scheme: *Mid-term test: -- Internal Assessment: -- End semester exam:---*

Prerequisite	*Human Values and engg ethics*
Course outcome	*To understand value of education and self-development To develop good values and characterTo know Human right and legislative procedure*

BTEEE 505 ELECTIVE- IV: 2. ADVANCES IN RENEWABLE ENERGY SYSTEMS
Teaching scheme:
Theory: 3 hrs
Total credit: 3
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Prerequisite	*Introduction to Non-Conventional energy sources*
Course outcome	*To know the principle of energy conversion technique from biomass, geothermal and hybrid energy systems.To understand effects of air pollution and ecosystems*

BTEEOE 506: ELECTIVE-V 2 POWER PLANT ENGINEERING. Teaching scheme:
Theory: 3 hrs
Total credit: 3
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Prerequisite	*Power system I, power system II, machine I and II*
Course outcome	*To review basic components of power system, energy sources.To understand principle of construction and operation of different conventional power plants*

Semester: VI

BTEEC 601. CONTROL SYSTEM Teaching scheme:
Theory: 3 hrs
Tutorial: 1 hr
Total credit: 4
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Prerequisite	*Control system I*
Course outcome	*To understand the behavior of nonlinear control system.To design and analyze PID controller.To understand and analyze state variable technique.To design and analyze suitable control system for engineering application*

BTEEC602 PRINCIPLES OF ELECTRICAL MACHINE DESIGN
Teaching scheme:
Theory: 3 hrs
Tutorial: 0 hr
Total credit: 3
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Prerequisite	*Machine I and II,*
Course outcome	*To understand principles of electric machine design. To design different components of electric machine. To design TransformerTo understand CAD and use it for transformer design*

BTEEC603 POWER ELECTRONICS
Teaching scheme:
Theory: 3 hrs
Tutorial: 1 hr
Total credit: 4

Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Prerequisite	*Electronic Devices And Circuits*
Course outcome	*To review principle of construction, operation and characteristics of basic semiconductor devices.To understand and analyze performance of controlled and uncontrolled converters. To understand and analyze performance of DC to DC converters. Dc to AC converters. To understand and analyze performance of AC voltage controllers*

BTEEE604 : Elective-VI: 1. INDUSTRIAL AUTOMATION AND CONTROL

.

Prerequisite	*Control system I, industrial automation*
Course outcome	*To understand construction and working principle of different industrial measurement systems.To understand new trends in industrial process control.*

BTEEE605 ELECTIVE-VII 1. SWITCH GEAR AND PROTECTION Teaching scheme:
Theory: 3 hrs
Total credit: 3
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Prerequisite	*Power system I and II, control system I and II, machine I and II*
Course outcome	*To understand principles of protective relaying.To understand principle of construction, operation and selection of different type of circuit breaker used in power system.To understand different protection schemes used in power system operation*

BTEEOE606 ELECTIVE- VIII. 2. PROJECT MANAGEMENT Teaching scheme:
Theory: 3 hrs
Total credit: 3
Examination Scheme:
Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks

Prerequisite	*Communication skills.*
Course outcome	*To understand concepts of project management. To develop a project plan.To understand the project implementation strategy. To analyze post project affects*

2.6.1 – COURSE OUTCOMES FOR ALL COURSES

Program: Electrical Engineering
Academic Year: 2021-22
Class: Final Year
Semester: VII and VIII

SEMESTER VII

BTEEC701: POWER SYSTEM OPERATION AND CONTROL	
Teaching Scheme:	Examination Scheme:
Theory: 3hr	Mid-term Test: 20 Marks
Tutorial: 0	Internal Assessment: 20 Marks
Total Credits: 3	End Term Exam: 60 Marks

Course Outcome:

1. Explain the fundamental concept of power system.
2. Design the mathematical model of synchronous machine.
3. Design the mathematical model Excitation system and speed governing system.
4. Analyze the transient stability of power system using swing equation and equal area criteria.
5. Analyze the economic operation of power system.
6. Explain the methods of Voltage control.

BTEEC702: HIGH VOLTAGE ENGINEERING	
Teaching Scheme:	Examination Scheme:
Theory: 3hr	Mid-term Test: 20 Marks
Tutorial: 0	Internal Assessment: 20 Marks
Total Credits: 3	End Term Exam: 60 Marks

Course Outcomes:

1. Illustrate the concept of electric field stresses, applications of insulating materials and methods for Non-destructive testing of equipment like transformers, insulators, isolators, bushings, lightning arrestors, cables, circuit breakers and surge diverters.
2. Explain the breakdown process in solid, liquid, and gaseous materials
3. Analyze methods for generation and measurement of High Voltages and Currents (both ac and dc)
4. Describe the phenomenon of over-voltage and choose appropriate insulation co-ordination levels based on IS & IEC Standards.

BTEEC703: ELECTRICAL DRIVES	
Teaching Scheme:	Examination Scheme:
Theory: 3hr	Mid-term Test: 20 Marks
Tutorial: 0	Internal Assessment: 20 Marks
Total Credits: 3	End Term Exam: 60 Marks

Course outcomes:

Analyze the dynamics of Electrical Drives system.
Use various control techniques for controlling the speed of AC and DC motors.
Analyze the AC and DC drives.
To Select/recommend the appropriate Drive according to the particular applications.
State the recent technology of AC and DC drive

BTEEE704B: ELECTRIC TRACTION & UTILIZATION	
Teaching Scheme:	Examination Scheme:
Theory: 3hr	Mid-term Test: 20 Marks
Tutorial:	Internal Assessment: 20 Marks
Total Credits:3	End Term Exam: 60 Marks

Course Outcomes:

After Completion of this Course, student will be able to

1. Identify types of Traction System.
2. Interprete Various Power supply in Electric Traction.
3. Analyze Various Traction Motors.
4. Define methods of Traction motor Control.
5. Elobrate Train movement & Breaking in Traction system.
6. Classify the indoor and outdoor Illumination system.

BTEEE705C: ELECTRICAL POWER QUALITY	
Teaching Scheme:	Examination Scheme:
Theory: 3hr	Mid-term Test: 20 Marks
Tutorial:	Internal Assessment: 20 Marks
Total Credits:3	End Term Exam: 60 Marks

Course Outcome:

After Completion of this Course….

1. Student will be able to get the in-depth understanding of power quality issues & standards.
2. Students will be able to understand working of power quality improving Equipment's.

BTEEL708: ELECTRICAL DRIVES LAB	
Teaching Scheme:	Examination Scheme:
Practical: 2hr	Continuous Assessment: 30 Marks
Total Credits: 1	End Term Exam: 20 Marks

BTEES709: SEMINAR	
Teaching Scheme:	Examination Scheme:
Practical: 2hr	Continuous Assessment: 30 Marks
Total Credits: 1	End Term Exam: 20 Marks

BTEEP710: PROJECT PART-I	
Teaching Scheme:	Examination Scheme:
Practical: 6hr	Continuous Assessment: 30 Marks
Total Credits: 3	End Term Exam: 20 Marks

BTEEF711: FIELD TRAINING/INTERNSHIP/INDUSTRIAL TRAINING III	
Teaching Scheme:	Examination Scheme:
Practical: --	Continuous Assessment: --
Total Credits: 1	End Term Exam: 50 Marks

SEMESTER VIII

DC POWER TRANSMISSION SYSTEM	
Teaching Scheme:	Examination Scheme:
Theory: 03	Mid-term Test: 20* Marks
Tutorial: 00	Internal Assessment: 20* Marks
Total Credits: 3	End Term Exam: 60* Marks

Course Outline:

This course gives an introduction to the DC power transmission system using the conventional line commutated converters. The topics covered include a detailed analysis of the 6 pulse line commutated converter (LCC), 12 pulse LCC, capacitor commutated converter, DC link control, and design of single tuned filter.

ENTREPRENEURSHIP ESSENTIALS	
Teaching Scheme:	Examination Scheme:
Theory: 3hr	Mid-term Test: 20* Marks
	Internal Assessment: 20* Marks
Total Credits: 3	End Term Exam: 60* Marks

CourseOutline:

The course provides foundational knowledge on various aspects of entrepreneurial venture creation and management during its life-cycle. It has been designed to address multidisciplinary audiences. The objective of the course is to teach key issues faced by entrepreneurs and managers at different stages of the life-cycle of an enterprise and is relevant both for aspiring entrepreneurs and for decision makers in established enterprises. Topics can be classified in some major themes such as : Making a choice to create an entrepreneurial venture, current trend of technology entrepreneurship, how to start a start-up, identifying opportunities, factors driving competitive advantages, organizational structure, basic knowledge of financial statements and project report,introductory knowledge on marketing management, human resource management, & strategic management, risk analysis, legal aspect of business, how to raise fund during life-cycle of a new ventures.

BTEEP803: PROJECT-II	
Teaching Scheme:	Examination Scheme:
Practical: 30hr	Continuous Assessment: 100 Marks
Total Credits: 15	End Term Exam: 150 Marks

2.6.1 – COURSE OUTCOMES FOR ALL COURSES

Program: Electrical Engineering
Academic Year: 2022-23
Class: Final Year
Semester: VII and VIII

SEMESTER VII

BTEEC701: POWER SYSTEM OPERATION AND CONTROL	
Teaching Scheme:	Examination Scheme:
Theory: 3hr	Mid-term Test: 20 Marks
Tutorial: 0	Internal Assessment: 20 Marks
Total Credits: 3	End Term Exam: 60 Marks

Course Outcome:

1. Explain the fundamental concept of power system.
2. Design the mathematical model of synchronous machine.
3. Design the mathematical model Excitation system and speed governing system.
4. Analyze the transient stability of power system using swing equation and equal area criteria.
5. Analyze the economic operation of power system.
6. Explain the methods of Voltage control.

BTEEC702: HIGH VOLTAGE ENGINEERING	
Teaching Scheme:	Examination Scheme:
Theory: 3hr	Mid-term Test: 20 Marks
Tutorial: 0	Internal Assessment: 20 Marks
Total Credits: 3	End Term Exam: 60 Marks

Course Outcomes:

1. Illustrate the concept of electric field stresses, applications of insulating materials and methods for Non-destructive testing of equipment like transformers, insulators, isolators, bushings, lightning arrestors, cables, circuit breakers and surge diverters.
2. Explain the breakdown process in solid, liquid, and gaseous materials
3. Analyze methods for generation and measurement of High Voltages and Currents (both ac and dc)
4. Describe the phenomenon of over-voltage and choose appropriate insulation co-ordination levels based on IS & IEC Standards.

BTEEC703: ELECTRICAL DRIVES	
Teaching Scheme:	Examination Scheme:
Theory: 3hr	Mid-term Test: 20 Marks
Tutorial: 0	Internal Assessment: 20 Marks
Total Credits: 3	End Term Exam: 60 Marks

Course outcomes:

Analyze the dynamics of Electrical Drives system.
Use various control techniques for controlling the speed of AC and DC motors.
Analyze the AC and DC drives.
To Select/recommend the appropriate Drive according to the particular applications.
State the recent technology of AC and DC drive

BTEEE704B: ELECTRIC TRACTION & UTILIZATION	
Teaching Scheme:	Examination Scheme:
Theory: 3hr	Mid-term Test: 20 Marks
Tutorial:	Internal Assessment: 20 Marks
Total Credits:3	End Term Exam: 60 Marks

Course Outcomes:

After Completion of this Course, student will be able to

1. Identify types of Traction System.
2. Interprete Various Power supply in Electric Traction.
3. Analyze Various Traction Motors.
4. Define methods of Traction motor Control.
5. Elobrate Train movement & Breaking in Traction system.
6. Classify the indoor and outdoor Illumination system.

BTEEE705C: ELECTRICAL POWER QUALITY	
Teaching Scheme:	Examination Scheme:
Theory: 3hr	Mid-term Test: 20 Marks
Tutorial:	Internal Assessment: 20 Marks
Total Credits:3	End Term Exam: 60 Marks

Course Outcome:

After Completion of this Course….

1. Student will be able to get the in-depth understanding of power quality issues & standards.
2. Students will be able to understand working of power quality improving Equipment's.

BTEEL708: ELECTRICAL DRIVES LAB	
Teaching Scheme:	Examination Scheme:
Practical: 2hr	Continuous Assessment: 30 Marks
Total Credits: 1	End Term Exam: 20 Marks

BTEES709: SEMINAR	
Teaching Scheme:	Examination Scheme:
Practical: 2hr	Continuous Assessment: 30 Marks
Total Credits: 1	End Term Exam: 20 Marks

BTEEP710: PROJECT PART-I	
Teaching Scheme:	Examination Scheme:
Practical: 6hr	Continuous Assessment: 30 Marks
Total Credits: 3	End Term Exam: 20 Marks

BTEEF711: FIELD TRAINING/INTERNSHIP/INDUSTRIAL TRAINING III	
Teaching Scheme:	Examination Scheme:
Practical: --	Continuous Assessment: --
Total Credits: 1	End Term Exam: 50 Marks

SEMESTER VIII

DC POWER TRANSMISSION SYSTEM	
Teaching Scheme:	Examination Scheme:
Theory: 03	Mid-term Test: 20* Marks
Tutorial: 00	Internal Assessment: 20* Marks
Total Credits: 3	End Term Exam: 60* Marks

Course Outline:

This course gives an introduction to the DC power transmission system using the conventional line commutated converters. The topics covered include a detailed analysis of the 6 pulse line commutated converter (LCC), 12 pulse LCC, capacitor commutated converter, DC link control, and design of single tuned filter.

ENTREPRENEURSHIP ESSENTIALS	
Teaching Scheme:	Examination Scheme:
Theory: 3hr	Mid-term Test: 20* Marks
	Internal Assessment: 20* Marks
Total Credits: 3	End Term Exam: 60* Marks

CourseOutline:

The course provides foundational knowledge on various aspects of entrepreneurial venture creation and management during its life-cycle. It has been designed to address multidisciplinary audiences. The objective of the course is to teach key issues faced by entrepreneurs and managers at different stages of the life-cycle of an enterprise and is relevant both for aspiring entrepreneurs and for decision makers in established enterprises. Topics can be classified in some major themes such as : Making a choice to create an entrepreneurial venture, current trend of technology entrepreneurship, how to start a start-up, identifying opportunities, factors driving competitive advantages, organizational structure, basic knowledge of financial statements and project report,introductory knowledge on marketing management, human resource management, & strategic management, risk analysis, legal aspect of business, how to raise fund during life-cycle of a new ventures.

BTEEP803: PROJECT-II	
Teaching Scheme:	Examination Scheme:
Practical: 30hr	Continuous Assessment: 100 Marks
Total Credits: 15	End Term Exam: 150 Marks