#### 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         |
|----------|--|
| COI      | modeling and analyzing electrical circuits.  |
| cor      | Solve problems related to Fourier transform, Laplace transform and applications to       |
| 02       | Communication systems and Signal processing.   |
|          | Obtain Interpolating polynomials, numerically differentiate and integrate functions,     |
| CO3      | numerical solutions of differential equations using single step and multi-step iterative |
|          | methods used in modern scientific computing.   |
| <u> </u> | Perform vector differentiation and integration, analyze the vector fields and apply to   |
| 04       | Electromagnetic fields.  |

#### **Course: Analog Circuits**

Course Code: BTEXC302

L:P:T:S: 2:2:1

Exam Hours: 3

ESE Marks: 60

Credits: 3 CIE Marks(MSE+CA1+ESE): 100 Total Theory Hours: 35

| CO1   | Understand the characteristics of IC and Op-Amp and identify the internal structure               |  |
|-------|---|--|
| CO2   | 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

L:P:T:S: 2:2:1

Exam Hours: 3

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

L:P:T:S: 2:2:1

Exam Hours: 3

ESE Marks: 60

Credits: 3 CIE Marks(MSE+CA1): 40 Total Theory Hours: 35

Credits: 3

**Total Theory Hours: 35** 

CIE Marks(MSE+CA1+ESE): 100

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  |
|-----|--|
| COI | 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

L:P:T:S: 2:2:1:0

Exam Hours: 3

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: BTEXC403Credits: 3L:P:T:S: 2:2:1:0CIE Marks(MSE+CA): 40Exam Hours: 3Total 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    |
| 02  | 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

L:P:T:S: 2:2:1:0

Exam Hours: 3

Credits: 3 CIE Marks(MSE+CA): 40 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:

|     | Able to solve algebraic and transcendental equations by using numerical techniques        |
|-----|---|
| CO1 | 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: BTEXC501Credits:3L:P:T:S: 4:2:0:0CIE Marks (MSE+ESE+LAB): 200Exam Hours: 3Total Theory Hours: 35ESE Marks :100CIE Marks (MSE+ESE+LAB): 200

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 Exam Hours: 3 ESE Marks:100

CIE Marks(CE): 60 Total Theory Hours: 0

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

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 L:P:T:S: 4:0:0:0 Exam Hours: 0 ESE Marks : 100 Credits: 4 CIE Marks(CE): 100 Total Theory Hours: 0

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 L:P:T:S: 4:0:0:0 Exam Hours: 3 ESE Marks: 100

Credits:4 CIE Marks (TEST+PAPER): 100 Total Theory Hours: 35

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

L:P:T:S: 4:2:0:0

Exam Hours: 3

ESE Marks: 100

Credits:4 CIE Marks (TEST+PAPER+LAB): 200 Total Theory Hours: 35

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 L:P:T:S: 3:0:1:0 Exam Hours: ESE Marks: 60

Credits: 4 CIE Marks(MSE+CA1+CA2): 40 Total Theory Hours: 38

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

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 L:P:T:S:- 2:1:1:0 Exam Hours: 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 | 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 L:P:T:S:- 2:1:1:0 Exam Hours: ESE Marks: 60

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

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

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 L:P:T:S:- 2:0:0:0 Exam Hours: Credits: 2 CIE Marks(CA1+CA2): 50 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 L:P:T:S:- 2:1:2:0 Exam Hours:

ESE Marks: 60

Credits: 3 CIE Marks(MSE+CA1+CA2): 40 Total Theory Hours: 38

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

CO1 Design open channel section in a most economical way.

|     | 6 1                                    | 5   |
|-----|--|---|
| CO2 | Know about the non- uniform flows in o | open channel and characteristics of hydraulic |
|     | jump.                                  |   |
| CO3 | Understand application of momentum p   | rinciple 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 L:P:T:S:- 3:0:1:0 Exam Hours: ESE Marks: 60 Credits: 4 CIE Marks(MSE+CA1+CA2): 40 Total Theory Hours: 37

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   | D3 Manage own work to meet design requirements              |                            |
| CO4   | Work effectively in a team                                  |                            |

#### **Course: Numerical Methods in Engineering**

Course Code : BTCVE404A L:P:T: S:- 3:0:0:0 40 Exam Hours: ESE Marks: 60 Credits: 3 CIE Marks(MSE+CA1+CA2):

Total Theory Hours: 32

#### **Course: Planning for Sustainable Development**

Course Code : BTCVE404B L:P:T: S:- 3:0:0:0 40 Exam Hours: ESE Marks: 60 Credits: 3 CIE Marks(MSE+CA1+CA2):

Total Theory Hours: 28

#### **Course: Engineering Management**

Course Code: BTCVC406 L:P:T:S:- 1:0:0:0 Exam Hours: ESE Marks: Credits: AU CIE Marks(CA):50 Total Theory Hours: 14

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: BTHM3401Credits: AUL:P:T:S:- 2:0:0:0CIE Marks(CA):50Exam Hours:Total Theory Hours: 24ESE Marks: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

| 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 L:P:T:S:- 2:0:2:0 Exam Hours:

ESE Marks: 60

Credits: 4 CIE Marks(MSE+CA1+CA2): 40 Total Theory Hours: 38

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 L:P:T:S:- 2:0:1:0

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

Exam Hours: 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: BTCVC503Credits: 4L:P:T:S:- 3:2:1:0CIE Marks(MSE+CA1+CA2): 40Exam Hours:Total Theory Hours: 39ESE Marks: 60ESE 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 L:P:T:S:- 2:0:2:0 Exam Hours: ESE Marks: 60 Credits: 2 CIE Marks(MSE+CA1+CA2): 40 Total Theory Hours: 26

| 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 L:P:T:S:- 2:0:2:0 Exam Hours: ESE Marks: 60 Course Outcomes: At the end of the Credits: 2 CIE Marks(MSE+CA1+CA2): 40 Total Theory Hours: 30

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          |                            |
|                        | . 1                        |

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**

| 1 0 0                  |                            |
|------------------------|----------------------------|
| 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          |                            |
|                        | . 1                        |

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

#### 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 L:P:T:S:- 3:0:1:0 Exam Hours: ESE Marks: 60 Credits: 3 CIE Marks(MSE+CA1+CA2): 40 Total Theory Hours: 33

| 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 L:P:T:S:- 3:0:1:0 Exam Hours:

Credits: 3 CIE Marks(MSE+CA1+CA2): 40 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**

| Cours   | e 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 N   | SE Marks: 60                               |  |
| Course Outcomes: At the end of the course, student will be able to: |  |  |
| CO1   | Understand the various types and propertie | es of ingredients of concrete.             |
| CO2   | Understand effect of admixtures on the be  | havior of the fresh and hardened concrete. |
| CO3   | Formulate concrete design mix for variou   | s grades of concrete                       |
| CO4   |  |  |

#### **Course: Project Management**

Course Code: BTCVC604 L:P:T:S:- 2:0:1:0 Exam Hours: ESE Marks: 60

Credits: 2 CIE Marks(MSE+CA1+CA2): 40 Total Theory Hours: 29

| 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 L:P:T: S:- 2:4:0:0 Exam Hours: ESE Marks: 60 Credits: 2 CIE Marks(MSE+CA1+CA2): 40 Total Theory Hours: 48

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: BTCVC605ACredits: 3L:P:T: S:- 3:0:0:0CIE Marks(MSE+CA1+CA2): 40Exam Hours:Total Theory Hours: 36ESE Marks: 60Course 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.  |  |
| <b>CO4</b> | 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 L:P:T: S:- 3:0:0:0 Exam Hours: ESE Marks: 60 Credits: 3 CIE Marks(MSE+CA1+CA2): 40 Total Theory Hours: 36

| 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 L:P:T: S:- 3:0:0:0 Exam Hours: 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 | 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

L:P:T:S:- 2:0:1:0 Exam Hours: Credits: 3 CIE Marks(MSE+CA1+CA2): 40 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  | e 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  |                            |

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

| 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: BTCVC704Credits: 3L:P:T:S:- 2:0:1:0CIE Marks(MS)Exam Hours:Total Theory HESE Marks: 60Course Outcomes: At the end of the course, student will be able to:

Credits: 3 CIE Marks(MSE+CA1+CA2): 40 Total Theory Hours: 30

| Course | 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

| 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

L:P:T:S:- 2:0:1:0 Exam Hours:

ESE Marks: 60

Credits: 3 CIE Marks(MSE+CA1+CA2): 40 Total Theory Hours: 34

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 L:P:T:S:- 3:0:0:0 Exam Hours:

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

#### **Course: Disaster Preparedness & Planning Management**

Course Code: BTCVE802E L:P:T:S:- 3:0:0:0 Exam Hours: ESE Marks: 60

#### **Course: Bridge Engineering**

Course Code: BTCVE803A L:P:T:S:- 3:0:0:0 Exam Hours: ESE Marks: 60 Credits: 3 CIE Marks(MSE+CA1+CA2): 40 Total Theory Hours: 36

Credits: 3 CIE Marks(MSE+CA1+CA2): 40 Total Theory Hours: 34

| 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 L:P:T:S:- 3:0:0:0 Exam Hours: 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 | 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.   |
|     | Acquire knowledge of legal procedure to conduct structural audits.                  |
| CO5 |   |
| 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 | rse, 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 L:P:T:S:- 3:0:0:0 Exam Hours: ESE Marks: 60

Course: Finite Element Method

Course Code: BTCVE804D L:P:T:S:- 3:0:0:0 Exam Hours: ESE Marks: 60 Credits: 3 CIE Marks(MSE+CA1+CA2): 40 Total Theory Hours: 34

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

| 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: BTCVE804ECredits: 3L:P:T:S:- 3:0:0:0CIE Marks(MSE+CA1+CA2): 40Exam Hours:Total Theory Hours: 36ESE Marks: 60ESE Marks: 60

| 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 and their 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 to engineering problems

**4** Credits

- 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**

#### **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 developments of Engineering materials.

#### **Course Outcomes:**

#### Students will be able to :

- 1. Explain & apply the concept of types of Oscillation, Dielectric properties & ultrsonics
- 2. Explain & compare between Interference & Polarisation of light ,working Principle of Lasers & Fiber optics
- 3. Interprete, apply & demonstrate principle of motion of charged particles 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 forms the base of many modern devices and technologies.

#### **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**

### **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**

#### **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**

#### **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.

#### 2 Credits

#### 2 Credits

#### Audit

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 geometrical meaning 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 meaning of 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**

#### **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 various engineering 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 required 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

**Course Objectives:** 

#### 4 Credits

- 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**

#### **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 and transistors.
- 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.

#### Audit

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

MCA -First Year [First Semester]

#### **Code: MCA-R101 Programming Logic Concepts 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

**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 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 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 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 **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

#### **Course Outcome:**

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

### Credits: 04

### Credits: 02

#### 28-01-2021

#### Credits: 04

Credits: 04

Credits: 04

Credits: 04

Credits: 02
#### 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

| Sr. No. | Course Outcome   | Bloom Level   |  |  |
|---------|--|---------------|--|--|
| C01     | Demonstrate the ability to produce a technical document.   | Understanding |  |  |
| CO2     | Identify problems based on environmental, societal & research needs.   | Applying      |  |  |
| C03     | Apply Knowledge and skills to analyze and interpret data by<br>applying appropriate research methods to solve societal problems<br>in a group. | Applying      |  |  |
| C04     | Design and evaluate solutions for complex problems. Creating   |               |  |  |
| C05     | Build small groups to work effectively in team on medium scale<br>computing projects.  |               |  |  |
| C06     | Create value addition for the betterment of the individual and society   | Creating      |  |  |

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

#### **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:

|      | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|
| PEO1 |     |     |     |     |     |     |     |     |     |      |      |      |
|      |     |     |     |     |     |     |     |     |     |      |      |      |
| PEO2 |     |     |     |     |     |     |     |     |     |      |      |      |
| PEO3 |     |     |     |     |     |     |     |     |     |      |      |      |

#### Mapping with Program Outcomes

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

S- Strong; M-Medium; L-Low

## **BTCOE702** Cloud Computing

| [Lecture: 3 Periods/Week<br>Marks  | CA: 20 |
|------------------------------------|--------|
| 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-today 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 L:P:T : 3:0:1 Exam Hours: 3 Hours ESE Marks: 80 Credits: 4 CIE Mark :MSE 20 Total Theory Hours: 36

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

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

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

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

|     | ,  |
|-----|--|
| 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 : Microprocessors & Microcontrollers**

| Course Code: CI208  | Credits: 5             |
|---------------------|------------------------|
| L:P:T: 4:2:0        | CIE Marks(MSE): 20     |
| Exam Hours: 3 Hours | Total Theory Hours: 36 |
| ESE Marks: 80       |                        |

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

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

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      |                        |

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

| 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 | Credits: 5             |
|--------------------|------------------------|
| L:T:P: 4:0:2       | CIE Marks(MSE): 20     |
| Exam Hours: 3      | Total Theory Hours: 36 |
| ESE Marks: 80      |                        |

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

| 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

| 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<br>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

| 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

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

| 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 | Credits: 4             |
|---------------------|------------------------|
| L:P:T: 3:2:1        | CIE Marks(MSE): 20     |
| Exam Hours: 3hrs    | Total Theory Hours: 36 |
| ESE Marks: 80       |                        |

| 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

| COL                    | Demonstrate on understanding of the object oriented and distributed data models    |
|------------------------|--|
|                        | Demonstrate an understanding of the object oriented and distributed data models.   |
|                        |  |
|                        |  |
| $\alpha \alpha \alpha$ | County details and any second second   |
| CO2                    | Create database systems using xmi.   |
|                        |  |
|                        |  |
| 000                    |  |
| C()3                   | Demonstrate ability to prepare UML diagrams for information systems.               |
| 005                    |  |
|                        |  |
|                        |  |
| CO4                    | Formulate using SOL solutions to a broad range of query and data update problems   |
| COT                    | romanae, using 5 22, solutions to a broad range of query and data apoute 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-<br>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 | Credits: 4             |
|---------------------|------------------------|
| L:P:T: 1:2:0        | CIE Marks(MSE): 20     |
| Exam Hours: 3hrs    | Total Theory Hours: 36 |
| ESE Marks: 80       |                        |

| 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       |                        |

| 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 L:P:T: 4:0:2 Exam Hours: 3 hours 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 | 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<br>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 L:P:T: 4:0:2 Exam Hours: 3 hours ESE Marks: 80 Credits: 4 CIE Marks(MSE): 20 Total Theory Hours: 36

| 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 L:P:T: 4:0:2 Exam Hours: 3 hours 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 | 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       |                        |

| 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 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 | 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 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 | 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       |                        |

| 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

| 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 L:P:T:: 3:0:1 Exam Hours:3 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 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

L:P:T:: 2:0:0

Credits: 2

Exam Hours:3 Hours ESE Marks: 60 CIE Marks(MSE+CA1+CA2): 40

Total Theory Hours: 36

| 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\*

L:P:T:: 3:0:1

Exam Hours:3 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 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

Exam Hours:3 Hours ESE Marks: 60 CIE Marks(MSE+CA1+CA2): 40

Total Theory Hours: 36

| 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

L:P:T:: 3:0:1

Exam Hours:3 Hours ESE Marks: 60 Credits: 4

CIE Marks(MSE+CA1+CA2): 40

Total Theory Hours: 36

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

| 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/ $\mu$ COS 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

| 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      |
|     | 6  |
|     | integration, cost reductions and increased productivity.                                   |
|     |  |
| CO3 | To learn the best practices of ITSM methodology  |
| 000 |  |
|     |  |

## **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 | Credits: 4                 |
|------------------------|----------------------------|
| L:P:T: 3:0:0           | CIE Marks(MSE+CA1+CA2): 40 |
| Exam Hours: 3          | Total Theory Hours: 36     |
| ESE Marks: 60          |                            |

| 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<br>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

| 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

| 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

|     | · ·  |
|-----|--|
| 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

| 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 L:T:P: 3:1:0 Exam Hours: 3hrs 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 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         |                            |

| 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

40

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

| 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

| 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

| 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 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 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           |                            |

| 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

| 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         |                            |

| 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

L:P:T:: 3:0:0 Exam Hours:3 Hours 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 | 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

L:P:T:: 3:0:0 Exam Hours:3 Hours ESE Marks: 60 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 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

Credits: 3

L:P:T:: 3:0:0 Exam Hours:3 Hours ESE Marks: 60

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

| 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

L:P:T:: 3:0:0 Exam Hours: 3 Hours ESE Marks: 60

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 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 Total Theory Hours: 36 Exam Hours:3 Hours 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 |

Credits: 3

# **Course: Elective VIII (Deep Learning)**

Course Code: BTITOE704C

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

| 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

L:P:T:: 3:0:0 Exam Hours:3 Hours 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 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

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

Credits: 3

| 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 | 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 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  |
|---------------|---|
| CourseOutcom  | To review basic components of electric network. To design and develop network equations and   |
| е             | 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

 To introduce properties of fluid and hydraulic measurement To understand dynamics of fluid

| CourseOutcom<br>e | 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 |
|-------------------|--|
| e<br>e            | 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

| Pre requisite | Basic electrical engineering  |
|---------------|---|
| CourseOutcom  | To understand philosophy of measurement. To understand different methods analog and digital |
|               | measurement. To study principle of construction and operation of different transducer and   |
| C             | dismay methods.   |

#### BTHM3401 - Basic Human Rights

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

| TTCTCQuisite    |   |
|-----------------|---|
| CourseObjective |   |
| CourseOutcome   | To study concept of time value of moneyTo study about demand in detailTo understand Meaning<br>of Production and factors of production, To understand dif. Concept about market |
|                 |   |

| BTHM306. ENGI     | NEERING ECONOMICS  |
|-------------------|--|
| Teaching scheme   | e:   |
| Theory: 2 hrs     |  |
| Total credit: 2   |  |
| Examination Sch   | ieme:  |
| Mid-term test: 20 | Marks Internal Assessment: 20 Marks End semester exam: 60 Marks                          |
| Pre requisite     |  |
| CourseOutcom      | To study concept of time value of money To study about demand in detail To understand    |
| е                 | 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: <u>Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks</u>

| 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

 CourseOutcom
 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
 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.

 CourseOutcom
 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                               |  |  |
| CourseOutcom  | To study and understand MATLAB programming. To review mathematical concepts . To develop |  |  |
| е   | computer program for linear and nonlinear equations.                                     |  |  |

# Product Design Engineering

| Teaching Scheme:   | Examination Scheme:   |
|--|---|
| Lecture-cum-demonstration: 1 hr/week<br>Design Studio: 2 hr/week | <i>Continuous Assessment 1: 30 MarksContinuous<br/>Assessment 2: 30 MarksFinal Assessment: 40<br/>Marks</i> |

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,   |
|-------------------|---|
| CourseOutcom<br>e | 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**

| <b>Teaching Scheme</b> | L: 04    | <b>T: 00</b> | <b>P: 00</b>          |
|------------------------|----------|--------------|-----------------------|
| Evaluation             | ESE      | MSE          | Minimum Passing Marks |
| Scheme                 | 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**

| <b>Teaching Scheme</b> | L: 04    | <b>T: 00</b> | <b>P: 00</b>          |
|------------------------|----------|--------------|-----------------------|
| Evaluation             | ESE      | MSE          | Minimum Passing Marks |
| Scheme                 | 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

| <b>Teaching Scheme</b> | L: 03    | T: 01    | P: 00                 |
|------------------------|----------|----------|-----------------------|
| Evaluation             | ESE      | MSE      | Minimum Passing Marks |
| Scheme                 | 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

| <b>Teaching Scheme</b> | L: 03    | T: 01    | P: 00                 |
|------------------------|----------|----------|-----------------------|
| Evaluation             | ESE      | MSE      | Minimum Passing Marks |
| Scheme                 | 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      | ESE      | MSE      | Minimum Passing Marks |
| Scheme          | 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 constantcoefficient 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

| <b>Teaching Scheme</b> | L: 00    | <b>T: 00</b> | P: 02                 |
|------------------------|----------|--------------|-----------------------|
| Evaluation             | CE       | POE          | Minimum Passing Marks |
| Scheme                 | 30 Marks | 70 Marks     | 40%                   |

#### EE307. CONTROL SYSTEM-I LAB

| Teaching Scheme | L: 00    | <b>T: 00</b> | P: 02                 |
|-----------------|----------|--------------|-----------------------|
| Evaluation      | CE       | POE          | Minimum Passing Marks |
| Scheme          | 30 Marks | 70 Marks     | 40%                   |

#### EE308. MICROCONTROLLERS AND MICROPROCESSORS LAB

| <b>Teaching Scheme</b> | L: 00            | <b>T: 00</b> | P: 02                 |
|------------------------|------------------|--------------|-----------------------|
| Evaluation             | CE               | POE          | Minimum Passing Marks |
| Scheme                 | 30 Marks         | 70 Marks     | 40%                   |
|                        | EE309. BASIC SIN | MULATION LA  | BORATORY              |
| Teaching Scheme        | L: 00            | <b>T: 00</b> | P: 02                 |
| Evaluation             | CE               | POE          | Minimum Passing Marks |
| Scheme                 | 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.

### **EE310. ELECTROMAGNETIC FIELDS**

| <b>Teaching Scheme</b> | L: 03    | T: 01    | P: 00                 |
|------------------------|----------|----------|-----------------------|
| Evaluation             | ESE      | MSE      | Minimum Passing Marks |
| Scheme                 | 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 SchemeL: 04T: 00P: 00EvaluationESEMSEMinimum Passing MarksScheme80 Marks20 Marks40%

#### **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    | <b>T: 01</b> | <b>P: 00</b>          |
|-----------------|----------|--------------|-----------------------|
| Evaluation      | ESE      | MSE          | Minimum Passing Marks |
| Scheme          | 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**

| <b>Teaching Scheme</b> | L: 04    | <b>T: 00</b> | <b>P: 00</b>                 |
|------------------------|----------|--------------|------------------------------|
| Evaluation             | ESE      | MSE          | <b>Minimum Passing Marks</b> |
| Scheme                 | 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

| <b>Teaching Scheme</b> | L: 03    | T: 01    | <b>P: 00</b>          |
|------------------------|----------|----------|-----------------------|
| Evaluation             | ESE      | MSE      | Minimum Passing Marks |
| Scheme                 | 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    | <b>T: 00</b> | P: 02                 |
|-----------------|----------|--------------|-----------------------|
| Evaluation      | CE       | POE          | Minimum Passing Marks |
| Scheme          | 30 Marks | 70 Marks     | 40%                   |

# EE316. CONTROL SYSTEM-II LAB

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

# EE317. POWER ELECTRONICS LAB

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

#### EE318. SEMINAR

.

| Teaching Scheme | L: 00     | <b>T: 00</b> | P: 02                 |
|-----------------|-----------|--------------|-----------------------|
| Evaluation      | CE        | POE          | Minimum Passing Marks |
| Scheme          | 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 & | <b>&amp; Economics</b> |
|--------------------------------|------------------------|
|--------------------------------|------------------------|

| Teaching Scheme | L: 04    | <b>T: 00</b> | <b>P: 00</b>          |
|-----------------|----------|--------------|-----------------------|
| Evaluation      | ESE      | MSE          | Minimum Passing Marks |
| Scheme          | 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 |
|-----------------|---|
| Evaluation      | E |
| Scheme          | 8 |

L: 04 ESE 80 Marks T: 00 MSE 20 Marks P: 00 Minimum Passing 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    | <b>T: 00</b> | <b>P: 02</b>          |
|-----------------|----------|--------------|-----------------------|
| Evaluation      | CE       | POE          | Minimum Passing Marks |
| Scheme          | 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    | <b>T: 00</b> | <b>P: 00</b>          |
|-----------------|----------|--------------|-----------------------|
| Evaluation      | ESE      | MSE          | Minimum Passing Marks |
| Scheme          | 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** 

е

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 CourseOutcom 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

| CourseOutcom To introduce properties of fluid and hydraulic measurement To understand dynamics of fluid       | Pre requisite     | Basic Mechanical engineering   |
|---|-------------------|--|
| e flow To understand basic concepts of IC engines To understand concept of refrigeration and ail conditioning | CourseOutcom<br>e | 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

 To understand philosophy of measurement To understand different methods analog and digital.

|              | 5 5   |
|--------------|---|
| CourseOutcom | To understand philosophy of measurement. To understand different methods analog and digital |
|              | measurement. To study principle of construction and operation of different transducer and   |
| е            | 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 |
|---------------|---|
| courseoucome  | 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

 CourseOutcom
 To study concept of time value of money To study about demand in detail 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* 

|               | arks mernarkissessment. Zo marks End semester exam. oo marks                            |
|---------------|---|
| Pre requisite | Basic electrical engineering, Physics, Chemistry  |
| CourseOutcome | To study about crystal structureTo understand magnetic material structureTo study about |
| courseoucome  | 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

 CourseOutcom
 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* 

| Prerequisite      | Basic electrical technology,  |
|-------------------|---|
| Course<br>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.

 CourseOutcom
 To prepare estimates and costing of electrical installations of power system, To understand

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

procedures of contracting and purchase.

е

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                               |
|---------------|--|
| CourseOutcom  | To study and understand MATLAB programming. To review mathematical concepts . To develop |
| е             | computer program for linear and nonlinear equations.                                     |

# Product Design Engineering

| Teaching Scheme:   | Examination Scheme:   |
|--|---|
| Lecture-cum-demonstration: 1 hr/week<br>Design Studio: 2 hr/week | <i>Continuous Assessment 1: 30 MarksContinuous<br/>Assessment 2: 30 MarksFinal Assessment: 40<br/>Marks</i> |

- Pre-requisites: Knowledge of Basic Sciences, Mathematics and Engineering Drawing

 $\neg$  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,   |
|-------------------|---|
| CourseOutcom<br>e | 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: ELECTR                      | ICAL MACHINE-II Teaching scheme:   |
|                | Theory: 3 hrs                         |  |
|                | Tutorial: 1 hr                        |  |
|                | Total credit: 4                       |  |
|                | Examination Schem                     | 1e:  |
|                | Mid-term test: 20 Ma                  | rks Internal Assessment: 20 Marks End semester exam: 60 Marks                                |
|                | Prerequisite                          | Electrical machine I   |
|                |                                       | To study different methods of speed control of AC and DC motorTo study importance and        |
| Course outcome | Course outcome                        | 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: <u>Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks</u>

| 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 To know the principle of energy conversion technique from biom

|                | introduction to non controllar onergy courses   |
|----------------|---|
| Course outcome | To know the principle of energy conversion technique from biomass, geothermal and hybrid<br>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: <u>Mid-term test: 20 Marks Internal Assessment: 20 Marks End semester exam: 60 Marks</u>

| 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               |

| DIEECOUS FOWER           | ELECTRONICS   |
|--------------------------|---|
| Teaching scheme:         |   |
| Theory: 3 hrs            |   |
| Tutorial: 1 hr           |   |
| Total credit: 4          |   |
| <b>Examination Schem</b> | ne:   |
| Mid-term test: 20 Ma     | rks Internal Assessment: 20 Marks End semester exam: 60 Marks                             |
| Prerequisite             | Electronic Devices And Circuits   |
|                          | To review principle of construction, operation and characteristics of basic semiconductor |

| 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. |
|---|
| 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   |  |  |  |
| <b>Examination Schem</b>  | ne:  |  |  |
| 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,<br>operation and selection of different type of circuit breaker used in power system. To understand<br>different protection schemes used in power system operation |  |  |

# BTEEOE606 ELECTIVE- VIII. 2. PROJECT MANAGEMENT Teaching scheme: Theory: 3 hrs Total credit: 3

Examination Scheme:

| 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                           |

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

#### EE401. Industrial Management & Economics

| Teaching Scheme | L: 04    | <b>T: 00</b> | <b>P: 00</b>          |
|-----------------|----------|--------------|-----------------------|
| Evaluation      | ESE      | MSE          | Minimum Passing Marks |
| Scheme          | 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 |
|-----------------|---|
| Evaluation      | E |
| Scheme          | 8 |

L: 04 ESE 80 Marks T: 00 MSE 20 Marks P: 00 Minimum Passing 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    | <b>T: 00</b> | <b>P: 02</b>          |
|-----------------|----------|--------------|-----------------------|
| Evaluation      | CE       | POE          | Minimum Passing Marks |
| Scheme          | 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    | <b>T: 00</b> | <b>P: 00</b>          |
|-----------------|----------|--------------|-----------------------|
| Evaluation      | ESE      | MSE          | Minimum Passing Marks |
| Scheme          | 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.

## **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

 CourseOutcom
 To review basic components of electric network. To design and develop network equations and e

 e
 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

 CourseQuiceom
 To introduce properties of fluid and hydraulic measurement To understand dynamics of fluid

| Prerequisite      | basic Mechanical engineering   |
|-------------------|--|
| CourseOutcom<br>e | 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  |  |
| CourseOutcom<br>e   | 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. |  |

Assessment 20 Marks

#### 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<br>of Production and factors of production. To understand dif. Concept about market |

| BTHM306. ENGI       | NEERING ECONOMICS  |  |
|---------------------|--|--|
| Teaching scheme     | 9:   |  |
| Theory: 2 hrs       |  |  |
| Total credit: 2     |  |  |
| Examination Scheme: |  |  |
| Mid-term test: 20   | Marks Internal Assessment: 20 Marks End semester exam: 60 Marks                          |  |
| Pre requisite       |  |  |
| CourseOutcom        | To study concept of time value of money To study about demand in detail To understand    |  |
| е                   | 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 To study about crystal structureTo understand magnetic material structureTo study about *CourseOutcome* 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  |
|-------------------|---|
| CourseOutcom<br>e | To study classification of signals and system To analyze diff. types of time signal |

#### SEMESTER IV

 BTEEC 401. ELECTRICAL MACHINES – 1

 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
 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.

| CourseOutcom | To prepare estimates and costing of electrical installations of power system, To understand |
|--------------|---|
| е            | 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

| CourseOutcom | To study and understand MATLAB programming.To review mathematical concepts .To develop |
|--------------|--|
| е            | computer program for linear and nonlinear equations.                                   |

#### Product Design Engineering

| Teaching Scheme:                            | Examination Scheme:                              |
|---|--|
| Lecture-cum-demonstration: 1 hr/week Design | Continuous Assessment 1: 30 MarksContinuous      |
| Studio: 2 hr/week                           | 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:

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

# **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<br>procedure of different performance test on AC and DC motor. To determine different operating<br>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

| TTCTCQUISITC   | rower system  |
|----------------|---|
| 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 Diaital electronics. electronics devices and circuits

| 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 To know the principle of energy sources

| Course outcome | To know the principle of energy conversion technique from biomass, geothermal and hybrid<br>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:

| 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 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 Transformer To 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                                 |
|----------------|--|
|                | To understand principles of protective relaying. To understand principle of construction,        |
| Course outcome | 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:

| 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 |

### Program: Electrical Engineering Academic Year: 2020-2021 Class: BE Semester: VII and VIII

#### **SEMESTER VII**

| <b>BTEEC701: POWER SYSTEM OPERATION AND CONTROL</b> |                               |  |
|---|-------------------------------|--|
| 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 coordination levels based on IS & IEC Standards.

| <b>BTEEC703: ELECTRICAL DRIVES</b> |                               |
|------------------------------------|-------------------------------|
| 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.

| <b>BTEEE705C: ELECTRICAL POWER QUALITY</b> |                               |
|--|-------------------------------|
| 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         |

| <b>BTEEP710: PROJECT PART-I</b> |                                 |
|---------------------------------|---------------------------------|
| 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 |
|-------------------|--------------------------|
|-------------------|--------------------------|

# **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<br>procedure of different performance test on AC and DC motor. To determine different operating<br>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

| TTCTCQUISILC   | Tower System  |
|----------------|---|
| 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 Diaital electronics. electronics devices and circuits

| 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 To know the principle of energy sources

| Course outcome | To know the principle of energy conversion technique from biomass, geothermal and hybrid<br>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:

| 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 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 Transformer To 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                                 |  |
|----------------|--|--|
|                | To understand principles of protective relaying. To understand principle of construction,        |  |
| Course outcome | 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:

| 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 |

### **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 coordination 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

| <b>BTEEE704B: ELECTRIC TRACTION &amp; UTILIZATION</b> |                               |  |
|---|-------------------------------|--|
| 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.

| <b>BTEEE705C: ELECTRICAL POWER QUALITY</b> |                               |  |
|--|-------------------------------|--|
| 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         |

### **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 coordination levels based on IS & IEC Standards.

| <b>BTEEC703: ELECTRICAL DRIVES</b> |                               |
|------------------------------------|-------------------------------|
| 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.

| <b>BTEEE705C: ELECTRICAL POWER QUALITY</b> |                               |
|--|-------------------------------|
| 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         |