Maitrey Education Society's

Nagarjuna

Institute of Engineering, Technology & Management

(AICTE, DTE Approved & Affiliated to RTM Nagpur University Nagpur)

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College Code: 4192

				(First Year)
				Course Outcomes
				First Semester
Sr. No	Subject Coad	Name of Subject	CO Coad	Course Outcomes
1	BSEI-1T	Mathematics I	BSEI-1T.1	Analyze real world scenarios to recognize when derivatives or integrals are appropriate, formulate problems about the scenarios, creatively model these scenarios (using technology, if appropriate) in order to solve the problems using multiple approaches, judge if the resultsare reasonable, and then interpret and clearly communicate the results
			BSEI-1T.2	Appreciate ODE and system of ODEs concepts that are encountered in the real world, understand and be able to communicate the underlying mathematics involved to helpanotherperson gain insight into the situation
			BSEI-1T.3	Apply knowledge of mathematics, physics and modern computing tools to scientificandengineering problems
			BSEI-1T.4	Develop an ability to identify, formulate and/or solve real world problems.
			BSEI-1T.5	Understand the impact of scientific and engineering solutions in a global andsocietal context.
2	BSEI-2T	Applied Physics	BSEI-2T.1	Apply concepts in interference and diffraction to solve relevant numerical problems and to relate to relevant engineering applications
			BSEI-2T.2	Learn the basic concepts of dual nature of matter and wave packet and apply them to analyze various relevant phenomena and to solve related numerical problems
			BSEI-2T.3	Recall the basic concepts of crystal structure and apply them in solving numerical problems based on them and in relating to applications for determination of crystal structure

			BSEI-2T.4	Relate the basic idea of total internal reflection to the propagation of light in an optical fiber and make use of the fiber concepts to solve numerical problems and relate to applications in engineering
			BSEI-2T.5	Find how to extend the basic concepts of motion of charged particles in electric magnetic fields to solve numerical problems and to relate to applications in electron optic devices and CRO
3	BSEI-2P	Engineering Physics (Practical)	BSEI-2P.1	Obtain the knowledge of solid and gaseous fuels and their Calorific Value determination.
			BSEI-2P.2	Recognize the type of liquid fuels and their uses in IC engines.
			BSEI-2P.3	Apply the knowledge about the use of alternative sources of energy& utilize solid waste as energy source
			BSEI-2P.4	Analyze the impacts of Industrial pollution and its control
			BSEI-2P.5	Develop innovative ideas for use of advanced materials in sustainable development.
4	BSEI-3T	Energy and Environment	BSEI-3T.1	Have firm foundations in the fundamentals and application of current chemical and scientific principles.
			BSEI-3T.2	Are skilled in problems solving, critical thinking and analytical reasoning.
			BSEI-3T.3	Students describe about water treatment for domestic and industrial applications.
			BSEI-3T.4	Identify the proper type cement selection for given purpose under given set of conditions.
			BSEI-3T.5	Recognize the proper metal, metal alloy or combination of metals to design the equipment system to minimize corrosion.

			BSEI-3T.6	Describe the methods of research and development to produce nonhazardous and eco-friendly materials to reduce consumption of earth's infinite resources .
5	BSEI-3P	Energy and Environment (Practical)	BSEI-3P.1	List the proper procedures and regulations for safe handling and use of chemicals and can follow the proper procedures and regulations for safe handling when using chemicals during different analysis.
			BSEI-3P.2	Perform, record, analyze and describe the results of chemical experiments.
			BSEI-3P.3	Identify and solve chemical problems and explore new areas of research.
6	BSEI-4T	Communication Skills	BSEI-4T.1	Students will be able to overcome barriers of communication
			BSEI-4T.2	Students will aquire public speaking skill and handle group situation professionally.
			BSEI-4T.3	Students will be able to comprehend passages and compose paragraphs
			BSEI-4T.4	Students will be able to construct error free and meaningfull sentences in english
7	BSEI-4P	Communication Skills	BSEI-4P.1	Students will be able to overcome listening barriers of communication
			BSEI-4P.2	Students will be able to enhance their comprehending skills and public skills.
			BSEI-4P.3	Students will be able to give effective presentations and handle group situations professionally

			BSEI-4P.4	Students will be able to use figurative language in their formal as well as informal communications.
8	BSEI–5T	Engineering Graphics	BSEI – 5T.1	The learner will able to understand the basic knowledge of engineering graphics such as instruments , lines , dimensioning techniqus, scales, sheet layouts. Construction of various engineering curves using drawing instruments and basic orthographic projection through drawing the projection of point and line.
			BSEI – 5T.2	The learner will able to understand projections of different types of planes (2D) and solid (3D)and will be able to draw different views of planes and solids.
			BSEI – 5T.3	The learner will able to understand concept of sectioning and development of lateral surfaces of solid and will be able to represent it.
			BSEI – 5T.4	Apply the visualization skills to draw simple isometric projection view from given orthographic views presisly using drawing equipment.
9	BESI–5P	Engineering Graphics (Practical)	BSEI – 5P.1	Draw the fundamental engineering objects using basic rules and able to construct the lines , simple geometries. Construct the various curves using the drawing instruments.
			BSEI – 5P.2	To draw two dimenstional and three dimensional objects presisely using drawing equipement
			BSEI – 5P.3	Draw the development of lateral surfaces for cut section of geometrical solids precisely using drawing equipment.
			BSEI – 5P.4	Draw simple isometric projection from given orthographic views precisely using drawing instrument.
10	BSEI-6T	Basics of Civil and Mechanical Engineering	BSEI-6T.1	introduction to what constitutes civil engineering, Identifying the various area available to pursue and specialize within overall field of civil Engineering. Highlighting the depth of engagement possible within each of these areas.
			BSEI-6T.2	Exploration of various possibilities of career in this field. Understanding the vast interfaces this field has with the society atlarge. Providing inspiration for doing creative and innovative work.

			BSEI-6T.3	Showcasing the many monuments, heritage structure , nationally important infrastructure and impressive project to serve as sources of inspiration. Highlighting possibilities of taking of enterprenual activities in this field. Providing the foundations for the students
			BSEI-6T.4	Discuss several manufacturing processes and identify the suitable process. Explain various types of mechanism and its application.
			BSEI-6T.5	Discribe and compare the conversion of energy from renewable and non renewable energy sources
			BSEI-6T.6	List down the types of road vehicle and their specifications. Illustrate various basic parts and transmission system of road vehicle.
Second Semester				
1	BSEII-1T	Mathematics II	BSEII-1T.1	Evaluation of complex integral using the various forms.
			BSEII-1T.2	Analyze and apply the concept of curve tracing to Engineering problems.
			BSEII-1T.3	Apply the concept of multiple integrals to evaluate mass, area ,volume and center of gravity.
			BSEII-1T.4	Recognize the need of vector differentiation to solve Engineering problems.
			BSEII-1T.5	Apply the concept of vector integrals (line, surface, volume)
			BSEII-1T.6	Analyze mathematical and statistical problems.
2	BESII-2T	Advanced Engineering Material	BSEII-2T.1	Students will understand the utilization of LASER technology in various disciplines and also understand the concept of optical fiber and its applications.

			BSEII-2T.2	Students will have an ability to use the basic knowledge about electron ballistics to understand working of devices like CRO, Cyclotron, Mass Spectrograph.
			BSEII-2T.3	Students will be able to apply the concepts of nanoscience in technology and study the drastic change in properties of nanosized materials and its effect on society.
3	BESII-2P	Advanced Engineering Material	BSEII-2P.1	Students would be able to verify principles/laws by selecting and using proper measuring instruments, interpret result and draw conclusions.
			BSEII-2P.2	Students will get familiarized with Cathode Ray Oscilloscope, its working, advantages and applications.
			BSEII-2P.3	Students will find various parameters using various properties of light.
			BSEII-2P.4	Students would be able to characterize the optical fiber cable by calculating various parameters.
4	BSEII-3T	Applied Chemistry	BSEII-3T.1	Get the proper knowledge about the composition of presently used drilling fluids, LPG, CNG, reformatted gasoline with new blending components.
			BSEII-3T.2	Students identify alternatives energy sources of gasoline and diesel.
			BSEII-3T.3	Students characterize different lubricants and their mechanisms for different types of machines.
			BSEII-3T.4	Students acquired information about new industrial techniques and inspired to work in R & D areas of far reaching consequences.
			BSEII-3T.5	Describe the concept of Nanotechnology and use of Engineering materials in day today life.
			BSEII-3T.6	Students categorize advanced materials and choose for proper applications.

5	BESII-3P	Applied Chemistry (Practical)	BSEII-3P.1	List the proper procedures and regulations for safe handling and use of chemicals and can follow the proper procedures and regulations for safe handling when using different instruments.
			BSEII-3P.2	Demonstrate the use of modern instrumentation, classical techniques, and properly record the results of their experiment.
			BSEII-3P.3	Identify and solve chemical problems and explore new areas of research especially in fuel and lubricants.
6	BSEII – 4T	Computational Skill	BSEII – 4T.1	An ability to compute resultant force and moment for a given system of forces.
			BSEII – 4T.2	Knowledge of analyzing two dimensional systems of forces for the beams, plane trusses and friction and understanding of spatial force system.
			BSEII – 4T.3	An ability to apply concept of virtual work to simple frame mechanisms and beams.
			BSEII – 4T.4	An ability to determine centroid and moment of inertia for a given lamina.
			BSEII – 4T.5	An understanding pertaining to application of D'Alembert's principle to connected system of bodies and analytical knowledge of elastic impact.
7	BSEII – 4P	Computational Skill	BSEII – 4P.1	An ability to compute resultant force and moment for a given system of forces.
			BSEII – 4P.2	Knowledge of analyzing two dimensional systems of forces for the beams, plane trusses and friction and understanding of spatial force system.
			BSEII – 4P.3	An ability to apply concept of virtual work to simple frame mechanisms and beams.

			BSEII – 4P.4	An ability to determine centroid and moment of inertia for a given lamina.
			BSEII – 4P.5	An understanding pertaining to application of D'Alembert's principle to connected system of bodies and analytical knowledge of elastic impact.
8	BESII-6P	Basics of Electrical Engineering	BSEII-6P.1	Student should understand the fundamentals of Generation, Transmission & Distribution of electrical energy, different protections and UPS.
			BSEII-6P.2	To gain the knowledge of construction and operation of electrical machines and their applications in industry
			BSEII-6P.3	Student should be able to calculate domestic electricity charges & be able to determine lamps required to attain proper illumination.
			BSEII-6P.4	Students will have the knowledge about Induction machine and their applications in industry.
9	BSEII – 7T	Engineering Mechanics	BSEII – 7T.1	An ability to compute resultant force and moment for a given system of forces.
			BSEII – 7T.2	Knowledge of analyzing two dimensional systems of forces for the beams, plane trusses and friction and understanding of spatial force system.
			BSEII – 7T.3	An ability to apply concept of virtual work to simple frame mechanisms and beams.
			BSEII – 7T.4	An ability to determine centroid and moment of inertia for a given lamina.
			BSEII – 7T.5	An understanding pertaining to application of D'Alembert's principle to connected system of bodies and analytical knowledge of elastic impact.

10	BESII-5P	WORKSHOP (Practical)	BESII-7P.1	At the end of this course students shall be able to use various types of carpentry hand tools like saws,chisels, markers & measuring instruments like engineering scale, trisquare . Application of various types of joints . Safety precautions to be
			BESII-7P.2	At the end of this course students shall be able to use various types of hand tools like various types of files,,chisels, markers, hammers, calipers & measuring instruments like engineering scale, trisquare etc. in fitting. & concept of matching two mating
			BESII-7P.3	At the end of this course students shall be able to use various types of hand tools & accessories like sledge hammers,hot chisel, different types of tongs & use of anvil for giving desired shape to the job in the smithy shop. Use & application of making various
			BESII-7P.4	At the end of this course students shall be able to operate manual arc welding equipment ,do edge preparation & cleaning of weld. Application of various types of joints in welding. Safety precautions to be followed while working in welding shop.
11	BSEII-8T	Indian Culture and Constitution	BESII-8T - 1	Sensitize students to culture or generate social awareness regarding modern issues
			BESII-8T - 2	Generate awareness of industrial work culture & process.
			BESII-8T - 3	Exposure to Organizational Behaviour
			BESII-8T - 4	Provide general awareness about the Indian Political system.
		Department of Mechanical Engineering		
		Third Semester Mechanical Engineeirng		
1	BEME301T	Applied Mathematics- III	BEME301T.1	Analyze Engineering problems related to Laplace transform : Unit step function , Periodic function , Dirac Delta function , Differential Equations & Integro – Differential Equations.

			BEME301T.2	Identify the periodicity of a function and analyze their physical & graphical behavior for Fourier series problems and application of fourier transform to solve Integral equation.
			BEME301T.3	Implement Calculus of Variation to extremize functional for solving optimization problem.
			BEME301T.4	Able to solve complicated integrals of real functions with the concept of complex variable.
			BEME301T.5	Evaluate problems of P.D.E : One dimensional heat equation , Wave equation .
			BEME301T.6	Identify Engineering problems related to Matrices : Eigen value problem & Differential Equations , Functions of Matrices.
2	BEME302T	Kinematics of Machine	BEME302T.1	To demonstrate/ describe the functionality (motion), synthesise and construct/compose mechanisms (simple mechanisms, 4-bar chain) of machines to provide specific motion and to calculate their mobility.
			BEME302T.2	To construct and calculate the velocity and acceleration of mechanisms and cam profiles using mathematical and graphical skills.
			BEME302T.3	Comprehend various terminologies used in different types of gears and conduct kinematic analysis of gears and gear trains used in mechanisms.
			BEME302T.4	Comprehend the working and functions of different types of clutches, brakes and dynamometers used in different types of machinery and their design aspects.
3	BEME303T	Fluid Mechanics	BEME303T.1	Demonstrate and explain the basic fluid mechanics principles related to the equilibrium and motion of fluids.
			BEME303T.2	Analyze the fluid flow phenomenon with respect to viscosity, hydro-static forces, buoyancy and stability, boundary layer flows.
			BEME303T.3	Calculate the flow using venturimeter, orifice meter, pilot tube, simple orifices, and pressure using different manometers.

			BEME303T.4	Estimates drag & lift forces on immersed bodies, calculate the energy losses for flow through pipes and carry out dimensional analysis
4	BEME304T	Manufacturing Processes	BEME304T.1	Select appropriate type of pattern & material for pattern making & appropriate moulding process for producing part under consideration.
			BEME304T.2	Design proper gating system, operation, construction & application of various types of furnaces. Application of special casting techniques. Know & select appropriate method of inspection of castings, identifying casting defects & suggesting
			BEME304T.3	Select appropriate welding or allied process & set correct welding parameters for the given components. Identify welding defect & correct the required parameter.
			BEME304T.4	Determine various parameters required in forming &forging processes such as roll separation force, driving force, torque, forging forces, equipment capacity etc. Application & operation of other forming processes.
			BEME304T.5	Determine various parameters required in press working processes such as cutting force, clearance, blank size calculation, equipment capacity etc. Application & operation of press.
			BEME304T.6	Select appropriate process for the manufacture of the given plastic components.
5	BEME304P	Manufacturing Processes (Practical)	BEME304P.1	Performing various tests on the moulding sand sample such as compressive strength testing, permeability test,moisture testing etc. To know the properties of the moulding sand.
			BEME304P.2	Pattern making from the given component drawing Or component
			BEME304P.3	Making complete mould from various types of patterns like single piece, split,etc.
			BEME304P.4	Preparing edges for joining thick plates by M.I.G welding,setting welding parameters such as current, inert gas pressure & job setting.
			BEME304P.5	Knowing how to melt metal in the furnace & pour the molten metal in the mould.

6	BEME305T	Engineering Metallurgy	BEME305T.1	Provides an integrated approach to the study of engineering materials, classification and properties. Develop fundamental concepts of crystallography, phase transformation.
			BEME305T.2	Recognize the atomic structure of metals, imperfections, diffusion mechanisms and mechanism of plastic deformation of various ferrous & non ferrous metals & their alloys.
			BEME305T.3	Describe equilibrium diagrams, time-temperature transformation curves and heat treatment processes. Relate the concepts of crystal structure, microstructure and deformation.List the alloy steels applications.
			BEME305T.4	Construct phase diagrams which are useful for design and control of heat treating processes, various ferrous & non ferrous metals & alloys with engineering applications. Perform hardness test, non-destructive tests & powder metallurgy with applications.
7	BEME305P	Engineering Metallurgy (Practical)	BEME305P.1	Observe crystal structure, microstructure using metallurgical microscope and prepare specimen for metallographic examination.
			BEME305P.2	Differentiate plain carbon steel, Cast Iron and non ferrous metals.
			BEME305P.3	Perform Heat-treatment and Jominy End Quench Test
			BEME305P.4	Measure hardness using Rockwell Hardness Tester to quantify the important properties and to decide the further plan.
8	BEME306P	Machine Drawing	BEME306P.1	Interpret, analyze and construct drawings of mechanical components and their assemblies.
			BEME306P.2	Describe, identify and interpret symbols and notations related to machining, geometrical and dimensional tolerances.
			BEME306P.3	Explain Principles and requirements production drawings and process sheets.

			BEME306P.4	Make qualitative selection of components for assembly and disassembly of important parts used in major mechanical engineering applications.
9	BEME307P	Technical Report and Seminar	BEME307P.1	Identify the recent trends and developments in mechanical engineering and related fields.
			BEME307P.2	Access information effectively and efficiently from a variety of sources and gather, organize, interpret, and document information logically, efficiently, and ethically.
			BEME307P.3	Prepare a formal seminar report on an identified and approved topic.
			BEME307P.4	Deliver an effective oral presentation.
			Forth Semester Mechanical Engineering	
1	BEME401T	Applied Mathematics- IV	BEME401T.1	Analyze and solve the problems by numerical Computation method : Transcendental Equations , System of linear Equations.
			BEME401T.2	Analyze and obtain the numerical solution of Ordinary Differential Equations & evaluate largest Eigen value by Iterative process.
			BEME401T.3	Analyze & solve Engineering problems related to Discrete Transform
			BEME401T.4	Obtain Series solution of some Differential Equations and recognize the characteristics & properties of Special functions.
			BEME401T.5	Develop logical thinking, decision making ability for Quantitative analysis.
			BEME401T.6	Identify connections between Probability distributions and the real world situations and find soulution

2	BEME402T	Engineering Thermodynamics	BEME402T.1	Define the basic concepts of thermodynamics, thermodynamics laws and their significance, energy transfer and analyse different thermodynamic processes and cycles using thermodynamic relations
			BEME402T.2	Explain First and Second law of thermodynamics, apply them to control mass and control volume systems and perform their analysis. Explain concept of entropy and availability and calculate entropy change for different thermodynamic processes.
			BEME402T.3	Describe the formation of steam, its characteristics, determine dryness fraction of steam using various calorimeters, and analyze various thermodynamic processes with steam as working fluid.
			BEME402T.4	Plot various air standard cycles and vapour power cycles such as Carnot, Otto, Diesel, Dual, Brayton, and Rankine cycles on P-v and T-s coordinates, explain the different processes of these cycles and perform their thermodynamic analysis.
3	BEME403T	Hydraulic Machines	BEME403T.1	Describe the Working principle, Construction, and Performance characteristics of hydraulic machines such as Impulse and Reaction Turbines, Centrifugal and Positive displacement Pumps and Miscellaneous Water lifting devices.
			BEME403T.2	Apply basic fluid mechanics principles (such as impulse momentum and angular momentum principles) to develop mathematical equations, for engineering analysis of hydraulic machines.
			BEME403T.3	Design pumps and hydraulic turbines using velocity diagrams, to determine blade angles, diameter/width of wheel, working proportions, power, and efficiencies. Students will be able to apply similarity theory and model analysis to hydraulic machines.
			BEME403T.4	Select appropriate hydraulic machine/s and accessories (like draft tubes) for the intended service in pumping systems, hydraulic power generation units or any such special purposes.
			BEME403T.5	Apply the basics of compressible flow for the design of convergent divergent nozzle.
4	BEME403P	Hydraulic Machines (Practical)	BEME403P.1	Demonstrate the laboratory working of hydraulic machines (turbines and pumps), their components and to plot and study the characteristic curves for these machines.
			BEME403P.2	Apply the basic principles of fluid mechanics like Continuity equation and Bernoulli's equation to the actual flow situations.

			BEME403P.3	Measure different parameters like pressure, discharge, manometric head using appropriate devices and subsequently to quantify the important parameters like Metacentric height, coefficient of discharge and major and minor losses.
5	BEME404T	Machining Processes	BEME404T.1	Explain the concepts of metal cutting , machining parameters, Merchant circle force analysis , cutting tool materials, coolants and their types.
			BEME404T.2	Describe the lathe machine constructional details and the various operations performed on lathe .
			BEME404T.3	Describe the Shaper , Slotter and Planer machine tool constructional details and the various operations performed on these machines.
			BEME404T.4	Describe the Milling machine tool constructional details, their types and the various operations performed on these machines.
			BEME404T.5	Describe the various surface finishing operations and machines constructional details used for surface finishing operations .
			BEME404T.6	Describe Drilling ,Boring,Broaching and reaming machines constructional details and the various operations performed on these machines.
6	BEME404P	Machining Processes (Practical)	BEME404P.1	Performing various machining operations like plane turning,step turning,taper turning,grooving, boring,thread cutting etc. on the lathe machine on the cylindrical surface
			BEME404P.2	Performing various machining operations like horizontal planing, angular cuting etc. on a flat surface on the shaper machine.
			BEME404P.3	Performing drilling operation on tapered surface on the radial drilling machine.
			BEME404P.4	Performing indexing i.e. Gear cutting operation on cylindrical surface on the milling machine.
			BEME404P.5	Performing surface grinding on flat machined surface on the surface grinding machine.

7	BEME405T	Mechanics of Material	BEME405T.1	Acquire basic knowledge on of stress, strain and their relations based on linear elasticity and compute and analyze stresses induced in basic mechanical components i.e. axial, shear, bending, torsion and combined stresses
			BEME405T.2	Interpret the data for given situation and select best suitable theory to get the safe design solution in the context of strength of material.
			BEME405T.3	Draw the shear force and bending moment for different types of loads and support conditions in beams and solve simple problems of shaft, beam, column by using different theories of failure.
			BEME405T.4	Have basic foundation knowledge of solid mechanics, which help them in learning the design procedure of machine components.
8	BEME405P	Mechanics of Material (Practical)	BEME405T.1	Acquire basic knowledge on of material testing especially in tension, compression, shear and bending.
			BEME405T.2	Understand load v/s deflection graph for ductile and brittle material under different loading conditions and the procedure to determine elastic constants like Young's Modulus and Shear Modulus with the help of experimentation.
			BEME405T.3	Know the breaking strength for materials in different loading conditions.
			BEME405T.4	Get familiarized with the procedure to determine strain energy absorbed in a body before getting fracture due to impact loading.
			BEME405T.5	Determine the hardness number of any metal / non-metal by penetration test
9	BEME406T	Environmental Studies	BEME406T.1	Student will get idea about importance of peoples awareness about Environment.
			BEME406T.2	Student will explain natural sources available and its importance.

			BEME406T.3	Student will get idea about Ecosystem.
			BEME406T.4	Student categorize and describe Biodiversity.
			BEME406T.5	Students analyze pollution problem and its management.
			BEME406T.6	Students will compare social environment and natural environment.
			BEME406T.7	Students will recognize relation between Human population and Environment.
10	BEME407P	Mini Project	BEME407P	Fabricate/Craft simple mechanical/electro-mechanical working models and demonstrate the underlying theory/principle
			BEME407P	Gather, plan, and organize needed information for writing a formal mini project report.
			BEME407P	Develop traits like interpersonal skills, team work spirit, planning and time management.
Fifth Semester Mechanical Engineering				
1	BEME501T	Industrial Economics and Entrepreneurship Development	BEME501T.1	Apply the economic terminology and correlate it with current industrial scenario in manufacturing and service sector
			BEME501T.2	outline the relation between business ,market and society which will be helpful for decision making in business
			BEME501T.3	demonstrate the effect of economic processes and measures taken by the government to control the prices of the products and services

			BEME501T.4	Take entrepreneurship as a career option.
2	BEME502T	Design of Machine Elements	BEME502T.1	Describe the basic machine element design procedure including basic failures under various loading conditions and select the materials for requirment.
			BEME502T.2	Select and Design various joints like riveted , welded ,bolted ,knuckle and cotter joint for specific applications.
			BEME502T.3	Identify the components of power transmission system, demonstrate their functions and design power transmission elements such as shafts, keys, brakes, clutch and power screws.
			BEME502T.4	Classify and choose type of springs and pressure vessels, Design various types of springs and pressure vessels for different loading conditions.
3	BEME503T	Advanced Production Processes	BEME503T.1	Non-conventional machining processes, areas of application, limitation, advantages, disadvantages & cost involved. Suggest right type of non-conventional process for given component according to its material, complexity & accuracy . Also viability
			BEME503T.2	Advance welding processes, process parameters, use of different inert gases. Engineering industries where these processes are applied & their viability.
			BEME503T.3	High production machines like capstan & turret, their various parts & mechanisms, attachments & accessories & their application, & limitation, tooling layout. How they are operated. Their specification. Basic knowledge of Advance manufacturing
			BEME503T.4	Further details about press tools. Designing of various types of dies. Make sheet layout to minimize wastage.
			BEME503T.5	Basic knowledge of Jigs & fixtures. Principle of location. Their application. Design,manufacture & assemble jig or fixture.
			BEME503T.6	Advance super finishing processes,their area of application, their advantages & disadvantages.

4	BEME504T	Heat Transfer	BEME504T.1	Identify and differentiate the different modes of heat transfer and related phenomenons, explain related governing laws and dimensionless numbers.
			BEME504T.2	Formulate models for heat conduction processes and apply analytical methods to solve one-dimensional conduction problems.
			BEME504T.3	Predict heat transfer rate for conduction with internal heat generation, fins and unsteady state heat transfer.
			BEME504T.4	Use appropriate empirical correlations to predict forced and free convection heat transfer, for internal and external flows and phase change phenomenons.
			BEME504T.5	Predict heat transfer by radiation from ideal and actual surfaces and enclosures.
			BEME504T.6	Evaluate heat exchanger performance for the given geometry and boundary conditions or design suitable heat exchanger geometry to deliver a desired heat transfer rate.
5	BEME504P	Heat Transfer (Practical)	BEME504P.1	Evaluate thermal conductivity, emissivity, heat transfer coefficients and Stefan Boltzmann constant.
			BEME504P.2	Characterize the conditions and mechanism of heat transfer by free convection and forced convection and how heat transfer rate is affected by the parameters involved.
			BEME504P.3	Distinguish between filmwise and dropwise condensation and conditions under which these 2 types of condensation occur.
			BEME504P.4	recognize how fin effectiveness is affected by changes in different convection conditions.
			BEME504P.5	Differentiate arrangement of parallel flow and counter flow heat exchanger and quantitative difference of heat transfer rate.
6	BEME505T	Mechanical Measurement & Metrology	BEME505T.1	Get acquainted with the Purpose, structure, functional elements, static and dynamic characteristics of measuring system and analyze errors in measurement and their reduction techniques by applying statistical techniques.

			BEME505T.2	Demonstrate the Principle of working, functional elements, Construction, Range of various electromechanical instruments and and design sensors and transducers for mechanical engineering applications.
			BEME505T.3	Demonstrate the ability to select various precision measuring instruments for measuring dimensional and geometrical parameters of a component.
			BEME505T.4	Identify the concept of interchangeability, operation and selection of comparators and Design limit gauges for checking dimensional accuracy of two mating parts forming a fit(Assembly).
7	BEME505P	Mechanical Measurement & Metrology (Practical)	BEME505P.1	Analyze and formulate empirical relation between mechanical and electrical / electronic quantities in the process of determining static sensitivity and calibration.
			BEME505P.2	Demonstrate the working of various Electromechanical and Precision measuring instruments and analyze the sources and magnitude of errors introduced in measurements.
			BEME505P.3	Design limit gauges for checking hole and shaft dimensions.
8	BEME506P	Computer Applications – I	BEME506P.1	Apply basic terminologies used in computer programming and will be able to write, compile and debug programs in 'C'.
			BEME506P.2	To design programs using different data types, structures and data structures in C language.
			BEME506P.3	To solve mathematical and engineering problems using computers with Knowledge of C.
9	BEME507P	Industrial Visit	BEME507P.1	Identify the different machines/equipments/systems in the industry and correlate it's functioning with the theoretical knowledge acquired in classroom.
			BEME507P.2	Acquire practical insights of the real-time industry environment and understand the latest work practices, functioning of various sections/departments, management practices and working safety.

			BEME507P.3	Recognize the process units of the industry and generate the process flow diagram.
			BEME507P.4	Plan, organise and engage in active learning outside the classroom.
			BEME507P.5	Prepare a report on industrial visit and deliver an effective oral presentation.
			Sixth Semester Mechanical Engineering	
1	BEME601T	Energy Conversion-I	BEME601T.1	Identify the components of thermal power plant, fuels for steam power plant, classify boilers, and explain construction and working of boilers and different boilers mounting and their applications.
			BEME601T.2	To define and classify boiler draught, calculate height, diameter and efficiency of chimney. To evaluate performance of boilers.
			BEME601T.3	Explain types, function of ash handling system, coal handling system. State principle and advantages of fluidized bed boilers, differentiate between its types. Calculate the fluidization velocity and pressure drop across the bed. Realize the need of
			BEME601T.4	Explain the function of steam nozzle, its types and applications. Design steam nozzle for different operating conditions, classify steam turbines, compare impulse and reaction turbine, explain compounding and governing of steam turbine, analyze
			BEME601T.5	Classify steam condenser and cooling tower, explain its working with applications. To evaluate performance of steam condenser.
2	BEME602T	Control Systems Engineering	BEME602T.1	Describe working and applications of various control systems and its components. Identify the type of control system and formulate the mathematical model of mechanical, electrical and electro-mechanical systems.
			BEME602T.2	Represent the system in block-diagram or signal flow graph and determine its transfer function.
			BEME602T.3	analyze first-second order systems in time domain for different input signals. Also, describe general principal, applications of different industrial controllers (P,PI,PID,hydraulic and pneumatic controller)

			BEME602T.4	analyze system stability and its behavior analytically using Routh's criterion and graphically using Root locus Bode plot and Polar plot.
			BEME602T.5	Represent system transfer function given in differential equation form in to state variable matrix and vice-versa. Also, test for controllability and observability of system.
3	BEME603T	Operations Research	BEME603T.1	Identify and develop quantitative operational research models from the verbal description of the real system
			BEME603T.2	Apply the characteristics of different types of decision-making environments for the appropriate decision making
			BEME603T.3	optimize the resources like men,machines ,material and time in order to achieve the goals in manufacturing industry and in service sector
			BEME603T.4	simulate to real life situations for their effectivity such as project management,waiting line situation etc.
4	BEME604T	Mechatronics	BEME604T.1	Identify scope and elements of mechatronics design process and types of control system
			BEME604T.2	Identify system interfacing requirements and data acquisition using signal conditioning and signal processing techniques
			BEME604T.3	Study various actuating systems of mechatronic applications
			BEME604T.4	Study digital logic for development of microprocessor
			BEME604T.5	Development of ladder diagram and programming using PLC for interfacing between hardware and software.
			BEME604T.6	Study of various modern automation systems such as SCADA and MEMS.

5	BEME604P	Mechatronics	BEME604P.1	Identify and explain various solid state electronic devices, sensors and actuators.
			BEME604P.2	Describe and demonstrate the conversion of signal from Analog to digital and vice versa.
			BEME604P.3	Implement ladder logic programming using PLC to develop various mechatronics applications
			BEME604P.4	Interpret and demonstrate various electro-pneumatic and electro-hydraulic systems using graphical symbols and circuit diagram.
6	BEME605T	Dynamics of Machines	BECME605T.1	Comprehend the machine dynamics through basic principles and their application to analyze near to life problem (ex. D'Alemberts Principle, gyroscope etc.)
			BECME605T.2	Analyze (graphically analytically) dynamic force conditions in planer mechanisms, components like cams and balancing of various machines.
			BECME605T.3	Study and design (fundamental level)operations of system components like flywheels and governors.
			BECME605T.4	Recognize and interpret the concept of vibration in various mechanical systems and analyze vibration characteristics for 1 & 2 DOF systems, for its control/use
7	BEME605P	Dynamics of Machines	BECME605P.1	Comprehend the machine dynamics through basic principles and their application to analyze force conditions applied to mechanisms, cams, balancing of machines, vibration in mechanical systems etc.
			BECME605P.2	Describe and formulate (graphically/ analytically) dynamic force conditions in planer mechanisms, components like cams, gears, balancing of various machines, etc.

			BECME605P.3	Demonstrate, record and interpret data of operations of system like gyroscope, governors, vibration characteristics of mechanical systems, etc (fundamental level).
			BECME605P.4	Identify the importance of safety, team work and effective communication for conduction of activity.
8	BEME606T	Functional English	BEME606T.1	The students' are able to recognise common errors in written communication and rectify them.
			BEME606T.2	The students' can identify and transform sentences from one form to the other.
			BEME606T.3	The students' are familiar with the need to foster a good vocabulary for effective and efficient communication.
			BEME606T.4	The fundamentals of preparing for an interview and the various aspects of technical writing are understood by the students'.
9	BEME607P	Computer Applications - II	BEME607P.1	Apply database concepts, Structures and terms related to database design and management.
			BEME607P.2	To use SQL (Structured Query Language) to create, manipulate and query database.
			BEME607P.3	Implement relational database into DBMS and Interpret database development and management processes.
			BEME607P.4	Use several commercially available database management system tools such as Microsoft Access and oracle SQL plus to generate simple databases for material management/ Inventory management/ Office automation etc.

10	BEME608P	Industrial Case Study	BEME608P.1	Describe the key components/systems/processes of the industry and get exposure of latest industrial technologies/practices.
			BEME608P.2	Identify/Study the industrial problem, apply knowledge and skills gained in previous courses to analyze and suggest possible solutions.
			BEME608P.3	Recognize the real life working environment and the right work attitude
			BEME608P.4	Acquire the skills to communicate effectively through written reports and oral presentations.
			BEME608P.5	Demonstrate the ability to work collaboratively towards a common purpose.
		Seventh Semester Mechanical Engineering		
1	BEME701T	Industrial Engineering	BEME701T.1	Able to demonstrate techniques of work-study and enlist the principles of ergonomics to investigate the existing way of doing work for improvement in industry and health
			BEME701T.2	Apply qualitative and quantitative demand forecasting technique deciding the resources requirement and production scheduling in an industry.
			BEME701T.3	Conduct a reliability study and to make recommendation with respect to the maintenance strategy to be used in industry
			BEME701T.4	To inculcate philosophy of quality and apply various concept of quality, statistical quality control tools and techniques in industry
2		Elective-I		
	BEME702T1	Industrial Robotics	BEME702T1.1	Survey the historical background of industrial robots and recent developments and can identify various components of a robotic systems.

			BEME702T1.2	Develop kinematics of 2 DOF and 3 DOF of 2D manipulators
			BEME702T1.3	Describe various control strategies used in robotic systems
			BEME702T1.4	Evaluate various work cell layouts and common industrial situations for robotic applications
3	BEME702T4	Power Plant Engineering	BEME702T4.1	Define the basic terms related to power plant economics, calculate cost of electricity generation, design tariffs and explain load division and effects of fluctuating load.
			BEME702T4.2	Explain working of steam power plant and its components, its analysis with regeneration and reheating, Describe need and operation of combined power generation.
			BEME702T4.3	Draw the layout of steam power plant, Describe coal firing methods and state benefits of pulverized fuel and fluidized bed combustion. Classify high pressure boilers and steam turbines and explain their working. Explain the need and importance of boiler
			BEME702T4.4	Select site for hydroelectric power plant, classify hydroelectric power plant and state the functions of its different components, Explain working of hydraulic turbines and its governing. Draw mass curve and flow duration curve and calculate the capacity of
			BEME702T4.5	Explain the basics of nuclear reaction such as nuclear fission, binding energy, energy release, chain reaction, half life period. Classify nuclear reactors and describe the construction and working of nuclear reactors, demonstrate the effect of nuclear
			BEME702T4.6	Identify different components of gas turbine power plant, methods used to improve efficiency of gas turbine power plant, its governing and comparison with other power plants. Classify different types of IC Engines, their components, various layouts
4	BEME702T3	Automobile Engineering	BEME803T5.1	Identify the different components such as and clutch, gear box, propeller shaft, differential, axles, wheels, tyres chassis and engine and explain different automobile system such as transmission system, fuel supply system, cooling system and
			BEME803T5.2	Demonstrate the working principle of different automobile system like brakes, steering system and suspension system.
			BEME803T5.3	Explain the functions of automobile electrical system like battery, lighting circuit, horn, wiper, panel board instrument, ignition system and automobile air-conditioning.

			BEME803T5.4	Acquire the knowledge of automobile body, safety considerations and modern development in automobile such as collusion avoidance, crash worthiness, ABS, electronic power steering, active suspension, intelligent light, navigational systems and
5	BEME703T	Computer Aided Design	BEME703T.1	Develop logic in the form of an algorithm to perform any task and generate a computer program using the algorithm
			BEME703T.2	Analyse the fundamentals behind basic transformations such as scaling, rotation and translation & special transformation such as reflection and shear in two dimensional and three dimensional graphics
			BEME703T.3	Differentiate and analyse various three dimensional model generation techniques and utilities.
			BEME703T.4	Develop finite element model of an engineering problem, apply loading conditions and boundary conditions and solve it for analysis of its performance in simulated condition.
			BEME703T.5	Optimize an engineering problem by selecting appropriate optimization technique for reducing man, machine and material cost.
6	BEME703P	Computer Aided Design (Practical)	BEME703P.1	Design a computer system by selecting different input and out devices required for graphic application.
			BEME703P.2	Write, compile and troubleshoot a computer program from the algorithm
			BEME703P.3	Validate the results of finite element solution using computer software
			BEME703P.4	Optimize an engineering problem using appropriate optimization technique
7	BEME704T	Energy Conversion - II	BEME704T.1	Describe the working principle and operation of reciprocating and rotary air compressor.

			BEME704T.2	Explain the working of I C Engines, fundamentals of I.C. engine combustion and describe the I.C. engine fuel injection systems such as carburetor and fuel pump.
			BEME704T.3	Analyze the performance of various types of reciprocating and rotary air compressors and internal combustion engines.
			BEME704T.4	Describe the working of Vapour Compression Refrigeration system, Vapour Absorption Refrigeration system and Air Refrigeration system, and list the various refrigerants and their properties
			BEME704T.5	Analyze the performance of Vapour Compression Refrigeration system using pressure – enthalpy and temperature – entropy diagrams
			BEME704T.6	Define various psychrometric processes, determine psytchrometric properties of moist air and perform simple air-conditioning calculations
8	BEME704P	Energy Conversion - II (Practical)	BEME704P.1	To conduct experiment on reciprocating and rotary air compressor and analyze its performance.
			BEME704P.2	Carry out performance test on single cylinder and multicylinder I.C. Engine and analyze its performance with variable load and variable speed condition. To measure and calculate various performance parameters of I.C. Engine and to identify and
			BEME704P.3	To conduct experiment on vapour compression refrigeration system and air conditioning unit and analyze its performance.
			BEME704P.4	To measure the exhaust emission from i.C. Engine under variable load condition and interpret the result
9	BEME705T	Design of Mechanical Drives	BEME705T-1	Apply concepts and theories of mechanics of material and kinematics/ dynamics of machine. Also, become conversant with fundamentals of various mechanical drives.
			BEME705T-2	develop competency in analytical methods for solving problem related to mechanical power transmission systems.
			BEME705T-3	Use principles and procedures for design and selection of shaft couplings, flywheel and bearings.

			BEME705T-4	Design and select flexible power transmission elements such as belts, chain and rope drives.
			BEME705T-5	Use principles and procedures for design and selection of various types of gears and IC engine components.
10	BEME705P	Design of Mechanical Drives (Practical)	BEME705P-1	Design various components of mechanical power transmission systems based on input-out requirements
			BEME705P-2	Work in a team to design, analyze and represent the real-time mechanical power transmission systems and its components.
			BEME705P-3	Read standard industrial catalog and select the various components used in mechanical power transmission system.
11	BEME706P	Project Seminar	BEME706P.1	Develop self learning ability by searching and organizing information and literature related to project work.
			BEME706P.2	Exhibit the skill to communicate effectively in both written and oral form.
			BEME706P.3	Acquire collaborative skill and interpersonal relationship by working in a group.
Eighth Semester Mechanical Engineering				
1	BEME801T	Industrial Management	BEME801T.1	Apply management concepts and human resource policies in industry and service sector during their career.
			BEME801T.2	Design plant layout ,Industrial safety programs and classification of production systems in industry

			BEME801T.3	interpret and apply basic financial and marketing management related concepts in industry
			BEME801T.4	Interpret and apply recent trends and quality concept for improving productivity in industry
		Elective – II		
2	BEME802T 1	Finite Element Method	BEME802T.1	Identify the application of fundamentals of solid mechanics for evaluation of structural, thermal and frequency response problems.
			BEME802T.2	Identify the use of the basic finite elements formulation for static and dynamic conditions for evaluation of Point load, body force, traction, torsion, thermal conductivity, steady state (heat transfer) truss, beam, frequency response, plane stress and plane
			BEME802T.3	formulate mathematical models for solution of common engineering problems using finite element methods i.e, formulation of simple problems using finite elements and to develop the ability to generate the governing finite element
			BEME802T.4	Identify the significance and difference between formulation and application of different finite element types in engineering problems
3	BEME802P 1	Finite Element Method (Practical)	BEME802P.1	Model finite element problems using commercial software and understand the fundamental use of finite element preprocessor like hypermesh and solvers like radioss and optistruct.
			BEME802P.2	Demonstrate the ability to evaluate and interpret FEA analysis results for design and evaluation.
			BEME802P.3	Evaluate the programming aspects of finite element formulation for solving engineering problems
4	BEME802T 5	Refrigeration & Air-Conditioning	BEME802T5.1	Describe the working principle, constructional details of different components and their controls for conventional and new refrigeration systems and to select the appropriate refrigerant in the light of contemporary issues of ozone depletion and global

			BEME802T5.2	Design and analyze refrigeration systems using basic principles of thermodynamics and the refrigerant property charts.
			BEME802T5.3	Apply the basic principles of psychrometry and fluid mechanics for achieving thermal comfort to ensure better health and work productivity.
			BEME802T5.4	Design and analyze air-conditioning systems using the basic principles of thermodynamics, psychrometry and fluid mechanics.
5	BEME802P5	Refrigeration & Air-Conditioning (Practical)	BEME802P5.1	Demonstrate the laboratory working of vapor compression refrigeration system as well as its different components.
			BEME802P5.2	Demonstrate the laboratory working of desert cooler and air conditioning system as well as their different components.
			BEME802P5.3	Analyze the performance of refrigeration and air-conditioning systems by quantifying the performance parameters like Compressor work, COP, refrigeration effect, by pass factor and efficiency of cooling coils from the measured quantities like flow
		Elective – III		
6	BEME803T1	Advanced Manufacturing Techniques	BEME803T1.1	Demonstrate the economics analysis and applications of non-traditional machining and grinding processes.
			BEME803T1.2	Describe various non- machining processes along with its process parameters and be able to select and apply suitable processes for an engineering product.
			BEME803T1.3	Compare the economics analysis and applications of unconventional welding techniques and acquire knowledge of basic welding techniques and be able to select and apply suitable process for an engineering product.
			BEME803T1.4	Cultivate understanding about different advance casting process and be able to select and apply suitable process for an engineering product.
7	BEME803T5	Advance I.C. Engine	BEME803T5.1	Identify the I. C. Engine components, explain its operation and construction and classify IC engine. Describe the different types of cooling and lubrication systems used I. C. Engine.

			BEME803T5.2	Define the characteristics of conventional and alternative fuels, demonstrate the fuel supply systems and air induction systems used in I. C. Engine.
			BEME803T5.3	Describe the process of combustion and factors affecting combustion in I. C. Engines.
			BEME803T5.4	Identify the performance parameter and carry out the performance analysis of I. C. Engine and methods to improve it.
			BEME803T5.5	Identify the real world engine design issues and suggest future engine designs for specific sets of constraints (fuel economy, performance, emissions)
8	BEME804T	Automation in Production	BEME804T.1	Get Acquainted With Automation, Its Type's ,Strategies , Assembly Line Balancing And Its Analysis, Methods Of Work Part Transport
			BEME804T.2	Recognize fundamentals and constructional features of N.C,CNC and D.N.C machines and prepare a cnc program for given part.
			BEME804T.3	Get Acquainted With The Robotic Configuration, Types Of Links, Joints, Grippers ,Industrial Robotics And Robot Applications.
			BEME804T.4	Cultivate Information About Automated Material Handling Systems, Automated Storage And Retrieval System (AGVS,AS/RS) Its Analysis,
			BEME804T.5	Get Acquainted With Automated Inspection (CAPP, CAQC, CMM) And Group Technology.
			BEME804T.6	Recognise CAD/CAM,CIM,FMS, Understand The Concepts Of Shop Floor Control
9	BEME804P	Automation in Production (Practical)	BEME804P.1	Recognize automation, corroborating these knowledge with case studies on automation systems. study and analyze the material handling systems, robots and GT
			BEME804P.2	demonstrate NC programming (manual/apt)

			BEME804P.3	simulate program on CNC milling/ lathe
			BEME804P.4	work on CNC milling/ lathe
10	BEME805T	Energy Conversion - III	BEME805T.1	Describe the basic principle, components and operation of gas turbines, jet propulsion system and nuclear power plants.
			BEME805T.2	Demonstrate the ability to analyze the performance parameters of gas turbines and various types of jet propulsion system .Gain understanding of cogeneration and combined power cycle.
			BEME805T.3	Apply knowledge of various renewable energy sources like solar energy and its various forms, its application, MHD and geothermal energy system and appreciate their role in the sustainable development.
			BEME805T.4	Demonstrate the working principle and constructional detail of various hydraulic and pneumatic systems and their components like pump ,compressor actuators,DCV,PCV ,FCV and FRL unit.
			BEME805T.5	Recognize the significance and need of energy conservation energy management and the process of energy audit and energy audit instruments.
11	BEME805P	Energy Conversion - III (Practical)	BEME805P.1	Interpret working and describe performance paraeters of gas turbines and jet propulsion system.
			BEME805P.2	Recognize and analyze different types of energy losses in any energy conversion system and its representation using Sankey diagram.
			BEME805P.3	Demonstrate knowledge of hydraulic pumps, industrial pneumatic circuits like meter in ,meter out, time delay circuit, AND/OR gate circuits etc. and its applications in industry.
			BEME805P.4	Demonstrate and analyze working of solar lighting and water heating system

Sr. No	Subject Coad	Name of Subject	CO Coad	Course Outcomes
12	BEME806P	Project	BEME806P.1	acquire the ability to generate, develop and evaluate ideas by synthesizing complex information from a variety of sources so as to apply these skills to the project task.
			BEME806P.2	demonstrate the ability to make links across different areas of knowledge and utilize critical thinking in problem solving.
			BEME806P.3	acquire collaborative skills and interpersonal relationship through working in a team to achieve common goals.
			BEME806P.4	acquire self-learning skills for evaluation and understanding of engineering applications and practices
			BEME806P.5	acquire the skills to communicate effectively and to present ideas clearly and coherently to specific audience in both the written and oral forms.

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III SEMESTER ETC

Sr. No	Subject Coad	Name of Subject	CO Coad	Course Outcomes
1	BEETE301T.	M-III	BEETE301T.1	The students will be able to form mathematical model corresponding to engineering problems by using various mathematical tools and interpret the solution physically and graphically.
			BEETE301T.2	The students will be able to apply the concept of advanced engineering mathematics to solve various complex engineering problems.
			BEETE301T.3	The students will be able to broaden the education necessary to understand the input of engineering solution in a global, economic, environmental and social context.
2	BEETE302T	EDC (TH)	BEETE302T.1	The students will get the basic concepts of different semiconductor components.
			BEETE302T.2	The students will be able to understand the use of semiconductor devices in different electronic circuits.

			BEETE302T.3	The students will be able to calculate different performance parameters of transistors.
3	BEETE302 P	EDC (PR)	BEETE302P.1	The students will be able to study basic concepts, DC circuits, AC circuits, semiconductors, Semiconductor devices, Power supply, Bipolar and Field effect transistor amplifiers, Frequency response of amplifier.
			BEETE302P.2	The students will be able to use various simulation tools to study Semiconductor devices, Power supply, Bipolar and Field effect transistor amplifiers.
4	BEETE303 T	EMI (TH)	BEETE303T.1	The students will be able to explain basic concepts and definitions in measurement.
			BEETE303T.2	The students will be able to explain the operation and design of electronic instruments for parameter measurement and operation of different Transducers.
			BEETE303T.4	The students will be able to explain the circuitry and design of various function generators.
5	BEETE303 P	EMI (PR)	BEETE303P.1	The students will be able to measure the resistance by various methods.
			BEETE303P.2	The students will be able to use the various measuring instruments such as CRO, Function generator, Spectrum analyzer etc in effective manner.
			BEETE303P.3	The students will be able to measure various physical parameters by using different techniques.
6	BEETE304 T	OOPS (TH)	BEETE304T.1	The students will be able to implement the concept of object oriented programming in any programming. language.
			BEETE304T.2	The students will be able to explain the basic data structures and algorithms for manipulating them.
			BEETE304T.3	The students will be able to implement these data structures and algorithms in the C++ language.
			BEETE304T.4	The students will be able to integrate these data structures and algorithms in larger programs.
			BEETE304T.5	The students will be able to code and test well - structured programs of moderate size using the C++ language.

			BEETE304T.6	The students will be able to apply principles of good program design to the C++ language.
7	BEETE304P	OOPS (PR)	BEETE304P.1	The students will be able to implement the concept of object oriented programming in any programming. language.
			BEETE304P.2	The students will be able to explain the basic data structures and algorithms for manipulating them.
			BEETE304P.3	The students will be able to implement these data structures and algorithms in the C++ language.
8	BEETE305T	NA	BEETE305T.1	The students will be able to understand, Analyse the basic AC and DC circuits using KCL,KVL and Network Theorems.
			BEETE305T.2	The students will be able to understand, identify and analyse the series, parallel resonance circuits.
			BEETE305T.3	The students will be able to formulate, solve the differential equations for RL, RC, and RLC circuits and carry out the transient analysis.
			BEETE305T.4	The students will be able to understand, analyse and design prototype LC filters and Resistive attenuators.
			BEETE305T.5	The students will be able to characterize; model the network in terms of all network parameters and analyse.
			BEETE305T.6	The students will be able to understand and formulate the network transfer function in s-domain and pole, zero concepts.
IV SEMESTER ETC				
1	BEETE401T	M- IV	BEETE401T.1	The students will be able to use the techniques, skills and modern engineering tools necessary for engineering practice.
			BEETE401T.2	The students will be able to recognise the need for, and an ability to engage in lifelong learning.
			BEETE401T.3	The students will be able to inculcate the habit of mathematical thinking to design a system, component or process to meet desired realistic need.

2	BEETE402T	PDM (TH)	BEETE402T.1	The students will be able to understand the basics of different components used in Power Electronics.
			BEETE402T.2	The students will be able to understand the working and characteristics of different power devices along with their applications in Electronic circuits.
			BEETE402T.3	The students will be able to understand the concept of AC-DC converters, Choppers, Inverters which are widely used in industries.
			BEETE402T.4	The students will be able to understand the different AC/DC machines and their speed control methods.
3	BEETE402P	PDM(PR)	BEETE402P.1	The students will be able to understand the working and nature of characteristics of different power components used in Power Devices.
			BEETE402P.2	The students will be able to calculate performance parameters for different devices.
			BEETE402P.3	The students will be able to perform different tests on Transformers and motors for calculating the losses, efficiency, regulation etc.
			BEETE402P.4	The students will be able to understand the concept of starters used for starting AC/DC motors.
			BEETE402P.5	The students will be able to understand different speed control methods for motors.
4	BEETE403T	EMF (TH)	BEETE403T.1	The students will be able to understand the concepts of Electric, Magnetic and Electromagnetic fields required to understand the concepts of Electronic Communication.
			BEETE403T.2	The students will be able to understand the different coordinate system for mathematical analysis of Electromagnetic Engineering.
			BEETE403T.3	The students will be able to understand the different theorems and their use in Electromagnetic field.
5	BEETE404T	DCFM	BEETE404T.1	The student will have knowledge and awareness of various digital components.
			BEETE404T.2	The student will be able to design combinational and sequential circuits.

		(TH)	BEETE404T.3	The student will have Awareness in Design of digital systems and concepts of Microprocessor.
6	BEETE405 T	SS (TH)	BEETE405T.1	The students will be able to get knowledge about different types of signals and systems used in communication electronics.
			BEETE405T.2	The students will be able to understand the concept of probability and its use in communication system.
			BEETE405T.3	The students will be able to embed the use of Fourier series and Fourier transform for feature extraction of different electronic signals.
7	BEETE406 T	EVS	BEETE406T.1	The students will be able to recognize major concepts in environmental sciences and demonstrate in-depth understanding of the environment.
			BEETE406T.2	The students will be able to develop analytical skills, critical thinking, and demonstrate problem-solving skills using scientific techniques.
8	BEETE407 P	SWS (PR)	BEETE407P.1	The students will be able to write MATLAB program for any given problem.
			BEETE407P.2	The students will be able to plot various functions using different graphical techniques.
			BEETE407P.3	The students will be able to make mathematical analysis for the given problem.
		V SEMESTER ETC		
1	BEETE501 T	AWP	BEETE501T.1	The students will be able to describe transmission line characteristics.
			BEETE501T.2	The students will be able to calculate antenna parameters.
			BEETE501T.3	The students will be able to analyse wire antennas.
	BEETE502 T		BEETE502T.1	The students will be able to describe internal organization of 8086/8088 µprocessor & 8051µcontrollers.

2		MPMC (TH)	BEETE502T.2	The students will be able to describe the concept of addressing modes and timing diagram of Microprocessor.
			BEETE502T.3	The students will be able to interface 8086 & 8051 with Keyboard/ Display, ADC/DAC, Stepper motor etc.
3	BEETE502P	MPMC (PR)	BEETE502P.1	The students will be able to demonstrate the concept of Assembly languages structure and programming.
			BEETE502P.2	The students will be able to interface various peripherals with 8086 and 8051.
			BEETE502P.3	The students will be able to simulate the programs on different software platforms.
4	BEETE503T	ACD (TH)	BEETE503T.1	The students will be able to describe the basic differential Amplifier using transistor and its operation & characteristic.
			BEETE503T.2	The students will be able to design linear Op-Amp circuits such as Voltage follower, Summing amplifier, scaling and averaging amplifier, Instrumentation amplifier circuits for various practical applications.
			BEETE503T.3	The students will be able to design non-linear Op-Amp such as Comparators, Comparator IC such as LM 339, Schmitt trigger, multivibrator circuits for various practical applications using IC555.
5	BEETE503P	ACD	BEETE503P.1	The students will be able to gain a sound understanding of the operation, analysis and design of analog electronic circuits and systems.
			BEETE503P.2	The students will be able to design linear and nonlinear applications of operational amplifier.
		(PR)	BEETE503P.3	The students will be able to design the oscillators and other complex circuits using op amp ICs.
6	BEETE504T	CE (TH)	BEETE504T.1	The students will be able to demonstrate a basic understanding of the term bandwidth and its application in communications.
			BEETE504T.2	The students will be able to describe quantizing and PCM signals, bandwidth and bit rate calculations, study amplitude & angle modulation and demodulation of analog signals etc.
			BEETE504T.3	The students will be able to solve the problems involving bandwidth calculation, representation & Generation of an AM sine wave.

7	BEETE504P	CE (PR)	BEETE504P.1	The students will be able to perform practical based on analog and digital modulation techniques.
			BEETE504P.2	The students will be able to study the analysis of AM and FM receivers.
			BEETE504P.3	The students will be able to study ASK, FSK and PSK techniques.
8	BEETE505T	IEED	BEETE505T.1	The students will able to understand the economic terminology and correlate it with current industrial scenario in manufacturing and service sector.
			BEETE505T.2	The students will be able outline the relation between business ,market and society which will be helpful for decision making in business.
			BEETE505T.3	The students will be able to understand major economic processes in an economy and control measures taken by government to control the prices in order to reduce its ill effect on the economy of a country.
			BEETE505T.4	The students would become aware about entrepreneurship as a career option.
			BEETE505T.5	The students will be able to know about various financial agencies and government support systems available in our country for supporting new entrepreneurs which would be helpful for them.

VI SEMESTER ETC				
1	BEETE601T	TSS	BEETE601T.1	The students will be able to describe the need for switching systems and their evolution from analogue to digital.
			BEETE601T.2	The students will be able to describe the Public Switched Telephone Network.
			BEETE601T.3	The students will be able to describe private networks.
	BEETE602T		BEETE602T.1	The students will be able to represent discrete-time signals analytically and visualize them in the time domain.

2		DSP (TH)	BEETE602T.2	The students will be able to meet the requirement of theoretical and practical aspects of DSP with regard to sampling and reconstruction.
			BEETE602T.3	The students will be able to design and implement digital filter for various applications.
3	BEETE602 P	DSP (PR)	BEETE602P.1	The students will be able to analyze and process the signals in the discrete domain.
			BEETE602P.2	The students will be able to design the filters to suit requirements of specific applications.
			BEETE602P.3	The students will be able to apply the techniques, skills, and modern engineering tools like MATLAB and digital processors.
4	BEETE603 T	CSE	BEETE603T.1	The students will be able to demonstrate an understanding of the fundamentals of (feedback) control systems & Represent the mathematical model of a system.
			BEETE603T.2	The students will be able to determine the time and frequency-domain responses of first and second-order systems to step and sinusoidal (and to some extent, ramp) inputs.
			BEETE603T.3	The students will be able to use root-locus technique to analyze, design and determine the (absolute) stability of a closed- Loop control systems.
			BEETE603T.4	The students will be able to understand & design compensator & transducer use in tele-communication purpose.
			BEETE603T.5	The students will be able to determine frequency domain specification with the help of Bode, Polar & Nyquist Plot.
			BEETE603T.6	The students will be able to apply the state variable approach in design.
5	BEENE604 T	DCOM(TH)	BEENE604T.1	The students will be able to explain the working principles of basic building blocks of a digital communication system.
			BEENE604T.2	The students will be able to describe a random process in terms of its mean and correlation functions and characterize special Gaussian and Rayleigh distributions.
			BEENE604T.3	The students will be able to explain receiver techniques for detection of a signal in AWGN channel.

6	BEENE604P	DCOM (PR)	BEENE604P.1	The students will be able to describe the concept of the digital communication based design for testing and analyze the circuits.
			BEENE604P.2	The students will be able to design and conduct experiments for testing digital communication circuits and systems.
			BEENE604P.3	The students will be able to analyze the different coding techniques for design and modelling of digital communication identify, formulate and solve digital communication circuits and systems problems.
7	BEETE605T	FE	BEETE605T.1	The students will be able to recognise common errors in written communication and rectify them.
			BEETE605T.2	The students will be able to identify and transform sentences from one form to the other.
			BEETE605T.3	The students will be able to be familiar with the need to foster a good vocabulary for effective and efficient communication.
			BEETE605T.4	The students will be able to know fundamentals of preparing for an interview and the various aspects of technical writing are understood by the students'.
8	BEECE606P	EWP (PR)	BEECE606P.1	The students will be able to use DSO & Spectrum analyzer.
			BEECE606P.2	The students will be able to interface peripheral with pc.
			BEECE606P.3	The students will be able to design pcb using designing software.
			BEECE606P.4	The students will be able to design & fabricate mini project.
9	BEETE607P	IV (PR)	BEETE607P.1	The students shall be able to apply this knowledge during their project and may be useful in future
			BEETE607P.2	The students shall be able to understand recent technology process. used in different industry.

			VII SEMESTER ETC	
1	BEETE701T	DSPA (TH)	BEETE701T.1	Students shall be able to describe the detailed architecture, addressing mode, instruction sets of TMS320C5X.
			BEETE701T.2	They will be able to write program of DSP processor.
			BEETE701T.3	They will be able to design & implement DSP algorithm using code composer studio.
2	BEETE701T	DSPA (PR)	BEETE701P.1	Students shall be able to understand the architecture of TMS and Motorola Processors.
			BEETE701P.2	They shall be able to implement different processing algorithms on DSP processors.
			BEETE701P.3	They shall be able to design different types of filters and study their characteristics.
3	BEETE702T	TV & VIDEO ENGG. (TH)	BEETE702T.1	By the end of the course, the students shall be able to analyze and understand colour T.V. System .
			BEETE702T.2	By the end of the course, the students shall be able to understand fundamental techniques of Different T.V. standards.
4	BEETE702P	TV & VIDEO ENGG. (PR)	BEETE702P.1	By the end of the course, the students shall be able to study & clarify the concept of repairs.
			BEETE702P.2	By the end of the course, the students shall be able to develop an understanding of electronics, mechanical and environmental factors involved in maintaining Tv equipment.
			BEETE702P.3	By the end of the course, the students shall be able to Analyze and synthesize TV Pictures, Composite Video Signal, TV Receiver Picture Tubes.
5	BEETE703T	OC	BEETE703T.1	Learn the basic elements of optical fibre.
			BEETE703T.2	Understand the different kinds of losses, signal distortion in optical wave guides & other signal degradation factors.

			BEETE703T.3	Classify various optical source materials, LED structures, LASER diodes.
6	BEETE704T	ADSD (TH)	BEETE704T.1	The students shall be able to design of combinational & sequential circuit.
			BEETE704T.2	The students shall be able to develop skilled VLSI front end designers
			BEETE704T.3	The students shall be able to implementation of digital system.
7	BEETE704P	ADSD	BEETE704P.1	The students shall be able to model, simulate, verify the digital model with hardware description language.
			BEETE704P.2	The students shall be able to design and prototype with programmable logic devices.
		(PR)	BEETE704P3	The students shall be able to learn the modular design style to create large digital logic circuits.
8	BEETE705T	MEMS	BEETE705T.1	Understand working principles of currently available microsensors, actuators used in Microsystems
			BEETE705T.2	Apply scaling laws that are used extensively in the conceptual design of micro devices and systems
			BEETE705T.3	Understand the basic principles and applications of micro-fabrication processes, such as photolithography, ion implantation, diffusion, oxidation, CVD, PVD, and etching.
			BEETE705T.4	Choose a micromachining technique, such as bulk micromachining and surface micromachining for a specific MEMS fabrication process
			BEETE705T.5	Consider recent advancements in the field of MEMS and devices.
9	BEETE705T	VSP	BEETE705T.1	Learn various methodologies to optimize power delay and area of VLSI design.
			BEETE705T.2	Build Real Time processing system

			BEETE705T.3	Design of algorithm structure for DSP algorithms based on algorithm transformation

<table>
<tr><td colspan="5" align="center">VIII SEMESTER ETC</td></tr>
<tr><td rowspan="3">1</td><td>BEETE801T</td><td>MICROWAVE & RADAR ENGG.</td><td>BEETE801T .1</td><td>To understand the principles of the advanced microwave engineering</td></tr>
<tr><td></td><td></td><td>BEETE801T .2</td><td>To design of passive and active microwave components and microwave circuits including: micro strip line, guided wave device</td></tr>
<tr><td></td><td>(TH)</td><td>BEETE801T .3</td><td>To study Klystron amplifier and oscillator</td></tr>
<tr><td rowspan="3">2</td><td>BEETE801P</td><td>MICROWAVE & RADAR ENGG.</td><td>BEETE801P .1</td><td>Describe working of microwave bench.</td></tr>
<tr><td></td><td></td><td>BEETE801P .2</td><td>Measure power & VSWR of microwave component.</td></tr>
<tr><td></td><td>(PR)</td><td>BEETE801P .3</td><td>Analyze the S-parameter of microwave component.</td></tr>
<tr><td rowspan="3">3</td><td>BEETE802T</td><td rowspan="3">CCN (TH)</td><td>BEETE802T.1</td><td>Understand the requirement of theoretical & practical aspect of computer network.</td></tr>
<tr><td></td><td>BEETE802T.2</td><td>Understand the network traffic in computer network.</td></tr>
<tr><td></td><td>BEETE802T.3</td><td>Describe various protocols used in network.</td></tr>
<tr><td rowspan="3">4</td><td>BEETE802P</td><td rowspan="3">CCN (PR)</td><td>BEETE802P.1</td><td>Understand and select various cables and connectors used for networking.</td></tr>
<tr><td></td><td>BEETE802P.2</td><td>Establish peer to peer computers as well as Local Area Network connectivity.</td></tr>
<tr><td></td><td>BEETE802P.3</td><td>Effectively use available networking tools in Computer Communication Network.</td></tr>
</table>

5	BEETE803 T	WMC	BEETE803T.1	Design a model of cellular system communication and analyze their operation and performance.
			BEETE803T.2	Quantify the causes and effects of path loss and signal fading on received signal characteristics.
			BEETE803T.3	To construct and analyze the GSM system.
6	BEETE804 T	WSN (TH)	BEETE804T.1	Demonstrate advanced knowledge and understanding of the engineering principle of sensor design, signal processing, established digital communications techniques, embedded hardware and software, sensor network architecture, sensor
			BEETE804T.2	Demonstrate a computing science approach, in terms of software techniques, for wireless sensor networking with emphasis on tiny sensors, sensor specific programming languages, RFID technology.
				embedded architectures, software program design and associated hardware, data fusion.
			BEETE804T.3	Demonstrate knowledge of the associated business, legislative, safety and commercial issues; future technological advances and the way these will impact on the engineering product enterprise process.
7	BEETE804 P	ES	BEETE804P.1	Design embedded based system .
			BEETE804P.2	Design embedded system based on RTOS and communication protocols.
8	BEETE805 T	R & A	BEETE805T.1	Explore 8051 microcontroller architecture.
			BEETE805T.2	Effectively utilize instruction set for assembly language programming.
			BEETE805T.3	Interface different on & off chip peripherals with 8051 using C language.
			BEETE805T.4	Basics of 8051 can be used for robotic applications.

Sr. No	Subject Coad	Name of Subject	CO Coad	Course Outcomes
9	BEETE805T	SAT	BEETE805T.1	Do research with capabilities in the design, development and manufacture of satellite communication systems used in a wide spectrum of applications.
			BEETE805T.2	Experience real world experience from household appliances to sophisticated satellite communication, from electronic ignition to neural networks and signal processing chips & to integrate academic discipline with project-based engineering applications.
	BEETE805T	COMM.	BEETE805T.3	Able for Acquisition of technical competence in specialized areas of Satellite Communication engineering.

<table>
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<tr><td colspan="5" align="center">Third Semester Electrical Engineeirng</td></tr>
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Sr. No	Subject Coad	Name of Subject	CO Coad	Course Outcomes
1	BEELE301T	Applied Mathematics-3	BEELE301T.1	1. Implement concept of Matrices and Eigen Value problem and to solve Differential Equations. Form mathematical modal corresponding to engineering problems by using Matrices .
			BEELE301T.2	2. Solve practical problems and analyze their physical and graphical interpretation by using Laplace and Fourier Transforms. Use Fourier Transform to analyse input-output relationships.
			BEELE301T.3	3. Apply concepts of partial differential equations, Integral Transforms in various practical problems
			BEELE301T.4	4. Demostrate Calculus of Variation to extremise Functional for Solving Optimization problem. Comment on obtained solutions in a very scientific approach with quantitative basis.
			BEELE301T.5	5. Use Fourier series methods to explore real-world time signals.
			BEELE301T.6	6. Apply the concept of advanced engineering mathematics to solve various complex engineerin g problems.

2	BEELE302T	Non-conventional Energy Sources	BEELE302T.1	1. Students will be able to explain the fundamentals of solar radiation geometry, its measurement & estimation.
			BEELE302T.2	2. Students can demonstrate the concept of conversion of solar radiation into heat using different types of collectors and storage devices.
			BEELE302T.3	3. Students will be able to identifty application of solar energy related to heating, cooling, cooking and electricity generation.
			BEELE302T.4	4. Students will be able to do site slection for wind farm and different types of wind generators.
			BEELE302T.5	5. Students will be able to explain the basics of ocean and tidal energy.
			BEELE302T.6	6. Students will compare electricity generation methods using small hydro, Bio-mass, Geothermal Energy, MHD, fuel cell.
3	BEELE303T	Electrical Measurement and Instrumentation (T)	BEELE303T.1	1. Students will be able to analyze the details of different Bridges used for measurement of R,L,C
			BEELE303T.2	2. Student will be able to analyze the details of different electrical instrument used for electrical measurement And Instrumentation.
			BEELE303T.3	3. Students will be able to recognize the details of different types of potentiometers and CT and PT and also Measurement of Power.
			BEELE303T.4	4. Students will be able to recognize the basic idea about transducer, Data Aquisition Systems
			BEELE303T.5	5. Students will be able to synthesize the basic idea about transducer and Measurement of acceleration, velocity Measurement of angular velocity, Torque and Power measurement, Torque, meter.
			BEELE303T.6	6. Students will be able to analyze the basic idea about Measurement of temperature using thermistor, RTD and thermocouple and Two color pyrometers, Optical pyrometer.

4	BEELE303 P	Electrical Measurement and Instrumentation (P)	BEELE303P.1	1. Students will be able to measure low & high Resistance by using DC bridges.
			BEELE303P.2	2. Students will be able to measure inductance & Capacitance by using AC bridges.
			BEELE303P.3	3. Students will be able to measure energy and to calculate measurement error
			BEELE303P.4	4. Students will be able to measure pressure by using Bourdon tube transducer.
			BEELE303P.5	5. Students will be able to determine physical displacement by using Linear Variable Displacement Transformer.
			BEELE303P.6	6. Students will be able to measure temperature using thermistor & RTD.
5	BEELE304 T	Network Analysis (T)	BEELE304T.1	1. Ability to describe kirchoff's laws and simplify the network using reduction techniques and mesh analysis
			BEELE304T.2	2. Evaluate electrical network by Nodal Analysis and Duality.
			BEELE304T.3	3. Analyze the circuit using the network simplification theorems and to obatin maximum power transferred to load
			BEELE304T.4	4. Analyze transient response of series and parallel ac circuits and to solve problems in time doamin using laplace transform and to synthesize the waveforms .
			BEELE304T.5	5. Formulate the network transfer function in s-domain and to obtain pole zero plot
			BEELE304T.6	6. Evaluate Two Port Network Parameters ,Three Phase Networks and Analyze the series and parallel resonant circuits.

6	BEELE304P	Network Analysis (P)	BEELE304P.1	1. Evaluate electrical network by Nodal Analysis and Duality.
			BEELE304P.2	2. Analyze the circuit using the network simplification theorems and to obatin maximum power transferred to load
			BEELE304P.2	3. Analyze transient response of series and parallel ac circuits and to solve problems in time doamin using laplace transform and to synthesize the waveforms .
			BEELE304P.3	4. Formulate the network transfer function in s-domain and to obtain pole zero plot
			BEELE304P.4	5. Evaluate Two Port Network Parameters ,Three Phase Networks and Analyze the series and parallel resonant circuits.
7	BEELE305T	Electronic Devices and Circuits (T)	BEELE305T.1	1. Students will be able to identify basic concepts of different semiconductor components
			BEELE305T.2	2. Students will be able to utilise semiconductor devices in different electronic circuits.
			BEELE305T.3	3. Students will be able to calculate different performance parameters of transistors.
			BEELE305T.4	4. Students will be able to plot and study the characteristics of semiconductor devices.
			BEELE305T.5	5. Students will be able tocompare various types of basic differential amplifiers
			BEELE305T.6	6. Students will be able to identify and visualize various digital components as well as will be able to design different combinational and sequential circuits

8	BEELE305 P	Electronic Devices and Circuits (P)	BEELE305P.1	1. Students will be able to plot the characteristic of semicondctor diode.
			BEELE305P.2	2. Students will be able to use semiconductor devices in different electronic circuits half wave and full wave rectifiers.
			BEELE305P.3	3. Students will be able to calculate different performance parameters of transistors.
			BEELE305P.4	4. Students will be able to work with practical circuit applications of feedback amplifiers and oscillators.
			BEELE305P.5	5. Students will be able to demonstrate the applications of different digital components.
			BEELE305P.6	6. Students will be able to work on practical circuit applications of different digital circuits.

IV Semester Electrical Engineering

1	BEELE401 T	Applied Mathematics-4	BEELE401T.1	1. Form mathematical model corresponding to engineering problems , analyze it and solve the problem by using basic mathematical tools and numerical computational methods such as Newton - Raphson method, Euler modified method, Milne's
			BEELE401T.2	2. Demonstrate an ability to identify formulate and solve Engineering problem using applied mathematics.
			BEELE401T.3	3. Apply Z – Transforms for analysis and designing of linear Discrete Systems in thermal and mechanical system
			BEELE401T.4	4. Recognize the importance of applied mathematics in the field of engineering and Prepare student to understand Probability Theory and use it for analysis of data.
			BEELE401T.5	5. Participate and succeed in competitive exams like GATE,GRE.
			BEELE401T.6	6. Inculcate the habit of mathematical thinking to design a system , component or process to meet desired realistic need.

2	BEELE402T	Elements of Electromagnetic Fields	BEELE402T.1	1. The students are able to define vectors and 3 dimensional coordinate systems, convert from one form to another and apply matrix algebra.
			BEELE402T.2	2. The students can explain the basic laws governing behaviour of electric field. Practice computations with variuos forms of field sources like point, line and surfaces.
			BEELE402T.3	3. The students are able to describe the concepts of Energy and potential related to steady electric fields.
			BEELE402T.4	4. The students are able to derive the boundary conditions and formulate the properties of conductors and dielectrics.
			BEELE402T.5	5. The students can work with the characteristics of steady magnetic fields and evaluate the magnetic field properties under various operatiin conditions.
			BEELE402T.6	6. The students can derive the equations and explain time varying form of fields equations. Make comparison between non-time varying fields and time varying fields.
3	BEELE403T	Digital & Linear Electronics Circuits (T)	BEELE403T.1	1. The students will have the understanding of fundamentals of logic families,K-map and combinational circuits
			BEELE403T.2	2. The students will have the understanding of flip-flops, different types of memory
			BEELE403T.3	3. The students will have the understanding of various types of counters.
			BEELE403T.4	4. The students will have the understanding of fundamentals of operational applifiers and its basic applications
			BEELE403T.5	5. The students will have the understanding of applications of operational amplifiers, A/D and D/A converter and PLL
			BEELE403T.6	6. The students will have the understanding of diiferent Linear Ics e.g regulator IC, comparatot IC and different multivibrator using IC 555

4	BEELE403 P	Digital & Linear Electronics Circuits (P)	BEELE403P.1	1. The students will have the understanding of fundamentals of logic families,K-map and combinational circuits
			BEELE403P.2	2. The students will have the understanding of flip-flops, different types of memory
			BEELE403P.3	3. The students will have the understanding of various types of counters.
			BEELE403P.4	4. The students will have the understanding of fundamentals of operational applifiers and its basic applications
			BEELE403P.5	5. The students will have the understanding of applications of operational amplifiers, A/D and D/A converter and PLL
			BEELE403P.6	6. The students will have the understanding of diiferent Linear Ics e.g regulator IC, comparatot IC and different multivibrator using IC 555
5	BEELE404 T	Electrical Machines –1	BEELE404T.1	1. The student should be able to explain the basic principle, construction, classification, connections, phasor diagrams, vector grouping, operation and testing of 3 -phase transformers.
			BEELE404T.2	2. The student should be able to implement conversion of 3-phase to 2 -phase supply, parallel operation of 3-ph. Transformers.
			BEELE404T.3	3. The student should be able to explain principle, armature and field construction, types, operation characteristics, voltage build up, armature reaction, commutation, methods to improve commutation in dc generators, performance characteristics and
			BEELE404T.4	4. The student should be able to explain principle, construction, types, torque development, performance characteristics, tests to determine parameters of equivalent circuit of 3-phase and double cage induction motors.
			BEELE404T.5	5. The student should be able to list methods of starting, speed control and braking of induction motors.
			BEELE404T.6	6. The student should be able to describe revolving and cross field theories, operation, characteristics, types, equivalent circuit & tests.

6	BEELE404P	Electrical Machines –1 (P)	BEELE404P.1	1. The student will be able to test 3 -phase transformers and evaluate its efficiency and regulation.
			BEELE404P.2	2.The student will be able to demonstrate performance characteristics and Speed control of DC Motor.
			BEELE404P.3	3. The student will be able to characterize voltage build up and analyze performance characteristics of DC Generator.
			BEELE404P.4	4. The student should be able to determine parameters of equivalent circuit of 3-phase induction motors.
			BEELE404P.5	5. The student will be able to analyze performance characteristics of Induction motor from No load to Full load.
			BEELE404P.6	6. The student should be able to analyze methods of starting, speed control and braking of 3-phase induction motors.
7	BEELE405T	Computer Programming (T)	BEELE405T.1	1. Students will be able to describe computers and operating systems and Structure of "C" program, Data types, Storage class, variables, expressions and Operators
			BEELE405T.2	2. Students will be able to define single dimensional array,two dimensional arrays and various sorting techniques like Bubble sort and selection sort.
			BEELE405T.3	3. Students will be able to identify importance of Pointers in "C', usage of structures and basics of strings and arrays
			BEELE405T.4	4. Students will be able to analyze different C++ concepts like Data Hiding and Encapsulation, Data Abstraction, Polymorphism, Inheritance, Object and classes etc.
			BEELE405T.5	5. Students will be able to work with different types of MATLAB files, importing and exporting data, conditional and iterative statements using MATLAB, programming using script files.
			BEELE405T.6	6. Students will be able to demonstrate matrix operation using programming and use of graphic tools for presentation.

8	BEELE405P	Computer Programming (P)	BEELE405P.1	1. Students will be able to describe computers and operating systems and Structure of "C" program, Data types, Storage class, variables, expressions and Operators
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			BEELE405P.5	5. Students will be able to work with different types of MATLAB files, importing and exporting data, conditional and iterative statements using MATLAB, programming using script files.
			BEELE405P.6	6. Students will be able to demonstrate matrix operation using programming and use of graphic tools for presentation.
9	BEELE406T	Environmental Studies	BEELE406T.1	1. Students will be able to explain about importance of people's awareness about Environment.
			BEELE406T.2	2. Student will explain natural sources available and its importance.
			BEELE406T.3	3. Student will be able to explain about Ecosystem.
			BEELE406T.4	4. Students will be able to categorize and describe Biodiversity.
			BEELE406T.5	5. Students will be able to analyze pollution problem and its management.
			BEELE406T.6	6. Students will recognize relation between social environment,natural environment and Human population

		V Semester Electrical Engineering		

1	BEELE501T	Electrical Power System-1	BEELE501T.1	Ability to understand generation, transmission and distribution of power.
			BEELE501T.2	Design and Model representation of the system components used in power system.
			BEELE501T.3	Calculate system parameters and characteristics for different system state.
			BEELE501T.4	Solve problems of transmission line by interpretation of equations and analytical solution in system design.
			BEELE501T.5	Describe basic concept of load flow analysis.
			BEELE501T.6	Develop understanding of elementary concepts of power control.
2	BEELE502T	UEE	BEELE502T.1	1. Students will be able to identify methods and applications of electric heating in industrial, commercial and residential purposes.
			BEELE502T.2	2. Students will be able to compare methods and applications of welding in industrial and commercial purposes using electric power.
			BEELE502T.3	3. Students will be able to describe illumination and design schemes for industrial, commercial and residential purposes.
			BEELE502T.4	4. Students will be able to visualize working of different types of refrigeration and air conditioning.
			BEELE502T.5	5. Students will be able to list different types of fan, blowers, pumps & compressors, their applications and energy saving measures.

			BEELE502T.6	6. Students will be able to identify various factors and energy saving measures related to D.G.Sets
3	BEELE503T	Electrical Machine Design	BEELE503T.1	1.Select proper material for design of a machine.
			BEELE503T.2	2. Design main dimension of core in case of core & shell type transformer.
			BEELE503T.3	3. Estimates its performance characteristics of transformer as per requirement and constraints specified.
			BEELE503T.4	4. Design of main dimensions of stator core in case of 3-ph induction motor
			BEELE503T.5	5. Design of squirrel cage & slip ring rotor of 3-ph Induction motor.
			BEELE503T.6	6. Design overall dimensions & cooling system of synchronous machines.
4	BEELE504T	Microprocessor and Interfacing (T)	BEELE504T.1	1. Students will be able to describe organization of microprocessors in in microcomputer system.
			BEELE504T.2	2. Students will be able to develop algorithms and their flow chart model further writing its assembly language code.
			BEELE504T.3	3. Students will be able to analyze hardware concepts of input-output devices needed to interface with microprocessor.
			BEELE504T.4	4. Students will be able to define various time constraints while handling slow memory/IO devices.
			BEELE504T.5	5. Students will be able to do programming and interfacing memory (RAM/EPROM), I/Omodules like ADC, DAC, Displays and Keyboards.

			BEELE504T.6	6. Students will be able to determine efficiency and stability of microcomputer system.
5	BEELE504 P	Microprocessor and Interfacing (P)	BEELE504P.1	1. Students will be able to describe organization of microprocessors in microcomputer system.
			BEELE504P.2	2. Students will be able to develop algorithms and their flow chart model further writing its assembly language code.
			BEELE504P.3	3. Students will be able to develope programming skills using 8085 ALP
			BEELE504P.4	4. Students will be able to develope programming skills using conditional instruction.
			BEELE504P.5	5. Students will be able to develope programming skills using subroutine function
			BEELE504P.6	6. Students will be able to analyze hardware concepts of input-output devices needed to interface with microprocessor.
6	BEELE505 T	Electrical Machines - 2 (T)	BEELE505T.1	1. Students will be able to identify constructional details principle of operation of three phase alternator.
			BEELE505T.2	2. Students will be able to evaluate performance of alternator under stedy state condition.
			BEELE505T.3	3. Students will be able to visualize parallel operation and sychronization of three phase altrnator.
			BEELE505T.4	4. Students will be able to enumerate constructional details principle of operation and sychronization of three phase alternators.
			BEELE505T.5	5. Students will be able to analyze the performance of alternator under transient and subtransient conditions.

			BEELE505T.6	6. Students will be able to explain constructional details principle of operation of Special Machines.
7	BEELE505 P	Electrical Machines - 2 (P)	BEELE505P.1	1.To compare various AC generators and develop ability to select suitable machine based on applications.
			BEELE505P.2	2. To experiment with regulation of alternators using various methods.
			BEELE505P.3	3. To demonstrate the synchronization of alternator by various methods.
			BEELE505P.4	4. To plot and verify V and inverted V curve of three phase synchronus motors
			BEELE505P.5	5. Visualize transient behaviour of alternator and measure different circuit parameters.
			BEELE505P.6	6. To explain the construction,principle and characteristics of special machines like reluctance motor and hysteris motor.
8	BEELE506 P	Electrical Drawing and Simulations(P)	BEELE506P.1	1. To draw single line diagram of substation layout and its assemblies using VISIO.
			BEELE506P.2	2. To draw single line diagram of cable layout and illumination scheme in case of small workshop or industry using VISIO software.
			BEELE506P.3	3. To simulate basic electric circuits using simulation software like PSIM , MATLAB etc.
9	BEELE507 P	Electrical Workshop	BEELE507P.1	1. To calculate total energy consumed or electric bill & illumination scheme in case of small consumers

			BEELE507P.2	2. To manufacture small VA rating shell type transformer.
			BEELE507P.3	3. To understand earthing systems & basic arrangement of substation
			BEELE507P.4	4. To design MATLAB programming for design of 3-ph transformer & induction motors

<table>
<tr><td colspan="5" align="center">VI Semester Electrical Engineering</td></tr>
<tr><td>1</td><td>BEELE601T</td><td>Power Station Practice</td><td>BEELE601T.1</td><td>1. Define Various sources of energy generation, conventional & Non – Conventional, Their scope and related factors with generation. They will also recognize the importance of interconnected grid systems</td></tr>
<tr><td></td><td></td><td></td><td>BEELE601T.2</td><td>2. Recognize arrangement and operation of Thermal Power Station along with operation & importance of Various equipments in Thermal Power plant. They will analyze and perform work in Thermal Power Plant</td></tr>
<tr><td></td><td></td><td></td><td>BEELE601T.3</td><td>3. Recognize the arrangement and operation of Hydro Power Station along with operation & importance of Various equipments & types of Hydro Power plant. They will analyze and perform work in Hydro Power Plant</td></tr>
<tr><td></td><td></td><td></td><td>BEELE601T.4</td><td>4. Recognize Arrangement and operation of Nuclear Power Station along with operation & importance of Various equipments like Nuclear Reactor in Nuclear Power plant. They will analyze and perform work in Nuclear Power Plant</td></tr>
<tr><td></td><td></td><td></td><td>BEELE601T.5</td><td>5. Analyse various issues related to voltage control and can apply knowledge to overcome them. Also student will formulate structure & calculate tariff for consumers.</td></tr>
<tr><td></td><td></td><td></td><td>BEELE601T.6</td><td>6. Define about Cogeneration & Captive Power Plant, their types. They will analyze and perform work with Co - Generation & Captive Power Generation units and also can lead the project for their sustainable development.</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td>2</td><td>BEELE602T</td><td>Engg Economics & Industrial Management</td><td>BEELE602T.1</td><td>1. Model the linear Electrical & Electromechanical systems through transfer function methodology.</td></tr>
<tr><td></td><td></td><td></td><td>BEELE602T.2</td><td>2. Describe various control system components and explain effect of feedback on parameter variations and disturbance signal.</td></tr>
</table>

			BEELE602T.3	3. Determine time response specifications for 2nd order under damped system and apply control system controllers for improvement of system performance.
			BEELE602T.4	4. Investigate stability of control system through root locus .
			BEELE602T.5	5. Analyze linear control system using Bode plot, Polar and Nyquist plots
			BEELE602T.6	6. Explain basic concepts of state variable approach and represent the system into standard forms.
3	BEELE603 T	Electric Drives & Their Controls	BEELE603T.1	1. To describe the basic structure of Electric Drive systems & Speed torque characteristics of common drive motors. To solve numericals on starting, speed control & braking
			BEELE603T.2	2. To solve numerical on heating and cooling curves, rating of motors & flywheel calculation.
			BEELE603T.3	3. To work with Programmable Logic Controller in Industry.
			BEELE603T.4	4. To design basic control circuits i.e. starting, reversing, speed control & braking for electric drives.
			BEELE603T.5	5. To gain an insight in the working of drives used in traction.
			BEELE603T.6	6. To work and identify drives used in the industry & basic working of digital control system.
4	BEELE604 T	Power Electronics (T)	BEELE604T.1	1. Interpret operation of various power semiconductor devices and its applications.
			BEELE604T.2	2. Interpret principle of switching circuits, AC regulators and its applications.

			BEELE604T.3	3. Analyze and design 1-phase and 3-phase Line commutated converters Circuit.
			BEELE604T.4	4. Interpret the applications of 1-phase and 3-phase Line commutated converters Circuit in DC Motor control, PF improvement methods, Dual Converters and Cycloconverters.
			BEELE604T.5	5. Analyze, design DC/DC converter circuits, its applications and understand, design basic inverter circuits.
			BEELE604T.6	6. Analyze Single phase and three phase bridge type inverter circuits, it's output voltage control, PWM techniques, understand basic CSI circuit and applications of Inverters.
5	BEELE604 P	Power Electronics (P)	BEELE604P.1	1. Obtain terminologies related to static VI characteristics of SCR experimentally.
			BEELE604P.2	2. Obtain and determine various quantities from the waveforms of UJT triggering circuit and AC voltage regulator, also identify the areas of its applications.
			BEELE604P.3	3. Evaluate various quantities from the waveform of 1-phase controlled rectifier Circuit, also identify the areas of its applications.
			BEELE604P.4	4. Verify the operation of 1-phase to 1-phase step down cycloconverter Circuit from the waveform, also identify the areas of its applications.
			BEELE604P.5	5. Obtain and evaluate the waveform of step down DC/DC converter circuit, also identify the areas of its applications.
			BEELE604P.6	6. Obtain and evaluate the waveform of 1-phase Half Bridge Series Inverter circuit, also identify the areas of its applications.
6	BEELE605 T	Control System - I (T)	BEELE605T.1	1) To model the linear time invariant Electrical & Electromechanical systems through transfer function methodology.
			BEELE605T.2	2) To compare and use various control system components and effect of feedback on parameter variations, disturbance signal.

			BEELE605T.3	3) To analyze time response and time response specifications for 2nd order underdamped system and application of control system controllers.
			BEELE605T.4	4) To determine the stability, analyze the relative stability of control system through root locus method.
			BEELE605T.5	5) To determine and carry out frequency domain analysis of linear system using bode plot, polar and nyquist plot, open loop and close loop frequency response, stability margin in frequency response.
			BEELE605T.6	6) To describe the introductory concepts of state variable approach, relation between transfer function and state variables, represent the system into standard forms.
7	BEELE605 P	Control System - I (P)	BEELE605P.1	1) To model the linear time invariant Electrical & Electromechanical systems through transfer function methodology.
			BEELE605P.2	2) To utilise various control system components and effect of feedback on parameter variations, disturbance signal.
			BEELE605P.3	3) To analyze time response and time response specifications for 2nd order underdamped system and application of control system controllers.
			BEELE605P.4	4) To determine the stability, analyze the relative stability of control system through root locus method.
			BEELE605P.5	5) To determine and carry out frequency domain analysis of linear system using bode plot, polar and nyquist plot, open loop and close loop frequency response, stability margin in frequency response.
			BEELE605P.6	6) To describe concepts of state variable approach, relation between transfer function and state variables, represent the system into standard forms.
8	BEELE606 P	Industrilal visits and report writing	BEELE606P.1	1. Characterize practical knowledge of Establishment (Visited Industry) and define electrical installations available in the visited industry.
			BEELE606P.2	2. Assess Electrical Power Generaton, Transmission and Distribution and synthesize the working of various equipments used in the establshment.

			BEELE606P.3	3. Describe the working of various equipments like current transformer, potential transformer, lightning arrestors, isolators,circuit breakers, protective relays, bus bars etc in substation.
			BEELE606P.4	4. Assess various types of loads available with ratings of equipments and design the single line diagram of the establishment.
9	BEELE607T	Functional English	BEELE607T.1	1. The students' are able to recognise common errors in written communication and rectify them.
			BEELE607T.2	2. The students' can identify and transform sentences from one form to the other.
			BEELE607T.3	3. The students' are familiar with the need to foster a good vocabulary for effective and efficient communication.
			BEELE607T.4	4. The fundamentals of preparing for an interview and the various aspects of technical writing are understood by the students'.
			VII Semester Electrical Engineering	
1	BEELE701T	Control System-2	BEELE701T.1	The students will define, compare and contrast lag and lead compensators.
			BEELE701T.2	The students will explain and write basic concepts of state variable analysis
			BEELE701T.3	Students will design suitable state feedback vector for the given control system.
			BEELE701T.4	The students will solve given optimal control problems The students will practice computer tools like MATLAB to the given optical control system problem.
			BEELE701T.5	The students will practice analytical and graphical methods of stability analysis of non linear control system and discrete time systems.

			BEELE701T.6	The students will solve stability analysis problems of discrete time control system
2	BEELE702T	Electrical Power-2	BEELE702T.1	1. Students will acquire ability to use symmetrical component theory to analyze unbalanced operating conditions of power system.
			BEELE702T.2	2. Students will be able to calculate short circuit currents and system voltages for symmetrical fault in power systems.
			BEELE702T.3	3. Students will be able to determine fault current during unsymmetrical fault condition.
			BEELE702T.4	4. Students will be able to solve stability problems by using equal area criterion and power angle equation.
			BEELE702T.5	5. Students will demonstrate a ability in optimal load scheduling considering transmission losses and to solve economic dispatch problems for power system.
			BEELE702T.6	6. Students will acquire knowledge about grounding of neutral in power system and necessity of series and shunt compensation in power system.
3	BEELE703T	Flexible AC Transmission Systems	BEELE703T.1	1. Define and explain interconnection of transmission systems, active and reactive power flow in a power system, stability of large interconnected systems, importance of FACTS technology in power systems.
			BEELE703T.2	2. Compare and contrast voltage sourced and current sourced converters, explain and write generalized techniques for harmonic elimination from different converters, various output voltage control techniques like SPWM and third harmonic control.
			BEELE703T.3	3. Define objectives of shunt compensation, explain methods of Controllable VAR generation like SVC and STATCOM, compare and contrast SVC and STATCOM, explain Static VAR systems.
			BEELE703T.4	4. Define objectives of series compensation, Explain variable impedance and switching converter type series compensators, explain external control for series reactive compensators.
			BEELE703T.5	5. Define objectives of voltage and phase regulation, explain basic concept of TCVR and TCPAR, hybrid phase angle regulators.

			BEELE703T.6	6. Explain Combined Controllers like UPFC and IPFC, concept of Sub synchronous resonance and mitigation of SSR with the help of NGH-SSR damping scheme, operating principle of TCBR.
4	BEELE704 T	High Voltage Engineering (T)	BEELE704T.1	1. Students will be able to describe the breakdown processes of gaseous, liquid, solid and vaccum dielectrics.
			BEELE704T.2	2. Students will be able to enumerate the causes of over voltages due to lightning and switching effects and their protection methods.
			BEELE704T.3	3. Students will be able to analyze the effects of transients in insulation design of power system.
			BEELE704T.4	4. Students will be able to classify and select the high AC, DC & impulse voltage generators for testing of insulators.
			BEELE704T.5	5. Students will be able to compare and analyze the methods of measuring high AC, DC and impulse voltage,s used for testing of insulators.
			BEELE704T.6	6. Students will be able to describe the non- destructive testing procedures for various power system apparatus.
5	BEELE704 P	High Voltage Engineering (P)	BEELE704P.1	1. Students will be able to enumerate the equipment's available in laboratory and list out safety precautions – 1
			BEELE704P.2	2.Students will be able to observe the phenomenon of formation of an arc – 2
			BEELE704P.3	3. Students will be able to determine the breakdown stregnth of liquid & different types of solid insulating materials – 3 – 5
			BEELE704P.4	4. Students will be able to plot the field distribution using electrolytic tank – 6
			BEELE704P.5	5. Students will be able to visualize and discuss the formation of corona on transmission line – 7

			BEELE704P.6	6. Students will be able to calibrate the high voltage measurement utilising the sphere gap –8, 9, 10
6	BEELE705 T	Electrical Installation Design (T)	BEELE705T.1	1. Students will be able to define concept of load forecasting; solve problems based on regression analysis. The students will recognize construction, types and selection of PVC/ XLPE cables and overhead conductors.
			BEELE705T.2	2. Students will be able to choose proper protective devices. They will also evaluate fault level at various locations in electrical supply networks and assess rating and location of series reactors.
			BEELE705T.3	3. Students will be able to define operation and selection of various starters for Induction Motors and selection of various other protective devices. They will design reactive power compensation in industries.
			BEELE705T.4	4. Students will be able to identify different procedures for receipt, storage, testing and commissioning of transformers along with its accessories viz OTI, WTI, Silica Gel Breather, MOG, Buchholz relay etc.
			BEELE705T.5	5. Students will be able to design 11 kV and 33 kV substations for utility and industrial installations and specify the ratings and specifications of apparatus used, construct single line diagrams with specifications for distribution networks, motor and power
			BEELE705T.6	6. Students will be able to identify different provisions for system and equipment earthings as per IS 3043. They will choose relevant provisions of IE rules for low medium and high voltage installations.
7	BEELE705 P	Electrical Installation Design (P)	BEELE705P.1	1. Students will be able to define Various Classes of Insulation Level & Fire Extinguishers . The students will recognize construction, types and selection of PVC/ XLPE cables and overhead conductors.
			BEELE705P.2	2. Students will be able to recognize and choose various Line Apparatus.
			BEELE705P.3	3. Students will be able to define operation and selection of various starters for Induction Motors and various other protective devices.
			BEELE705P.4	4. Students will be able to identify different Substation Layouts and Identify various associated switchgears and accessories required. They will also recognize various transformer protection devices.
			BEELE705P.5	5. Students will be able to design 11 kV and 33 kV substations for utility and industrial installations and specify the ratings and specifications of apparatus used, construct single line diagrams with specifications for distribution networks, motor and power

			BEELE705P.6	6. Students will be able to identify different provisions for system and equipment earthings as per IS 3043. They will also choose relevant provisions of IE rules for low medium and high voltage installations.
8	BEELE706 P	Project	BEELE706P.1	1. Student develop ability to work in team to provide optimal solution for the problems in industries.
			BEELE706P.2	2. Students can identify the limitations in the existing products and processes through research problem identification and literature survey.
			BEELE706P.3	3. Students get skilled in the designing complex mathematical models and do the simulations considering variation in system parameters and visualize its effect on the optimisation of output.
			BEELE706P.4	4. Students develop ability to use appropriate presentation tools like powerpoint, posters, technical papers.
		VIII Semester Electrical Engineering		
1	BEELE802 T	Power Semiconductor Based Drives	BEELE802T.1	1. Students will be able to analyze the structure of Electric Drive Systems, Requirements of Load Torque , Functions of Power Modulator and operating modes of
			BEELE802T.2	2. Students will be able to evaluate the operation of d.c motor drives to satisfy two and four quadrant operation to meet mechanical load requirement.
			BEELE802T.3	3. Students will be able to assess the performance of Induction Motor Drives and the various speed control techniques with emphasis on energy saving schemes.
			BEELE802T.4	4. Students will be able to describe the starting and braking of synchronous motor drives,variable frequency control, synchronous motor drives with load commutated inverter, cycloconverter.
			BEELE802T.5	5. Students will be able to analyze the basic operation of Brushless DC Motor,Stepper Motor , Switch Reluctance Motor, Solar and Battery Powered Drives .Energy Conservation measures and schemes
			BEELE802T.6	6. Students will be able to apply the knowledge of dc and ac motors to Traction Drives.

2	BEELE801T	Extra High Voltage AC & High Voltage DC	BEELE801T.1	1. The students will be able to evaluate power transmission capability and losses. Draw inferences based on variation of transmission distance and series compensation.
			BEELE801T.2	2. The students will be able to describe Corona behaviour and evaluate energy loss. Analyze the effect of variuos factors on corona losses.
			BEELE801T.3	3. Students are will be able to compare the EHVAC and HVDC system based on economical and technical aspects. Enlist advantages and limitation of either technologies.
			BEELE801T.4	4. Students will be able to explain the characteristics of controllers used in HVDC system. Develop basis of selecting the suitable control method for HVDC system.
			BEELE801T.5	5. Students will be able to identify sources of reactive power and select them as per requiremnts of HVDC system. Ability to design filters for HVDC system.
			BEELE801T.6	6. Students will be able to analyze the impact of variuos faults on HVDC system and suggest suitable protective circuits.
3	BEELE803T	Switchgear and Protection (T)	BEELE803T.1	1. Students will be able to locate the positions of relay and describes the fundamentals of protection schemes & trip circuit
			BEELE803T.2	2. Students will be able to characterize the basic concepts of over-current Electro – Mechanical relays and design the protection schemes for different feeder
			BEELE803T.3	3. Students will be able to characterize and compare different types of Distance Relays
			BEELE803T.4	4. Students will be able to describe need of differential protection and other protections and their applications to protect power system components
			BEELE803T.5	5. Students will be able to differentiate the need and concepts of static relays with over current, distance and differential relays
			BEELE803T.6	6. Students will be able to describe the basic concepts circuit breaker and compare their types like Oil, Air Break , SF6 , and Vacuum Circuit Breakers

4	BEELE803 P	Switchgear and Protection (P)	BEELE803P.1	1. Students will be able to obtain and analyze the characteristics of different types of static relays
			BEELE803P.2	2. Students will be able to obtain Operating characteristics of an IDMT Earth fault / Overcurrent relay
			BEELE803P.3	3. Students will be able to obtain and Analyse characteristics and need of current transformer as per its use
			BEELE803P.4	4. Students will be able to use circuit breakers depends on their rating, characteristics, need and use
			BEELE803P.5	5. Students will be able to obtain different parameters of a Circuit Breaker and verify results with MATLAB program
			BEELE803P.6	6. Students will be able to obtain Tranformer Protection scheme for a Oil filled Transformer using Virtual Lab
5	BEELE804 T	Computer Applications in Power systems (T)	BEELE804T.1	1. Students will be able to explain basic concepts of network topologies and determine network matrices by singular transformation for single phase power system network
			BEELE804T.2	2. Students will be able to determine network matrices by algorithm method for single phase power system network
			BEELE804T.3	3. Students will be able to apply basic concepts of network topologies to three phase network and analyze electrical power system for short circuit studies
			BEELE804T.4	4. Students will be able to analyze electrical power system for load flow and transient stability studies

6	BEELE804P	Computer Applications in Power systems (P)	BEELE804P.1	1 Student will be able to define basic concepts of network topologies and simple mathematical calculations for the formation of network matrices by singular transformation for single phase power system network.
			BEELE804P.2	2. Student will dothe mathematical calculations for the formation of network matrices by algorithm method for single phase power system network.
			BEELE804P.3	3. Students will be able to apply basic concepts of network topologies to three phase network .
			BEELE804P.4	4. Students will perform mathematical analysis and applications of computer tools like MATLAB , PSIM for load flow analysis for electrical power system.
7	BEELE805P	Project	BEELE805P.1	1. Students will develop ability to formulate the research problem and specify the constraints.
			BEELE805P.2	2. Students will develop skills to design the hardware circuits and /or simulate the ciruits.
			BEELE805P.3	3. Students will develop the technical Papers writing skills and present the project work in reputed conferences and /or journals, project competitions etc.
			BEELE805P.4	4. Students are able to measure, calibrate, compare and quantify the simulation and hardware results. Develop products, processes and services in electrical engineering of par excellence and strive for patents and publications in reputed journals.

Department of Civil Engineering

Course Outcomes

Third Semester Civil Engineering

Sr No.	Subject Coad	Name Subject	CO Coad	Course Outcomes
1	BTCVE301T	APPLIED MATHEMATICS-III	BTCVE301T.1	Apply Fourier series in the analysis of periodic functions not in terms sine and cosine encountered in engineering problems

			BTCVE301T.2	Solve Partial differential equations of first, higher and second order using elementary techniques; formulate mathematical models to simple problems of vibration of strings and
			BTCVE301T.3	Learn the concept of finding maxima and minima of definite integral involving unknown function and its derivatives.
			BTCVE301T.4	Learn Eigen value problem and its applications.
			BTCVE301T.5	Learn to find an approximate solution of algebraic and transcendental equations, system of linear equations and first order ordinary differential equations by various Numerical
			BTCVE301T.6	Formulate simple optimization problem and learn to solve it by Graphical method and Simplex method.
2	BTCVE302T	FLUID MECHANICS	BTCVE302T.1	Understand the importance and practical significance of various fluid properties
			BTCVE302T.2	Comprehend and estimate various forces acting on partially and fully submerged bodies
			BTCVE302T.3	Evaluate the importance of various parameters on the fluid motion.
			BTCVE302T.4	Know various flow measuring devices with their practical applications
			BTCVE302T.5	Illustrate the concept of impulse momentum principle, dimensional analysis and model analysis of a fluid phenomenon
3	BTCVE302P	FLUID MECHANICS	BTCVE302P.1	Understand the importance and practical significance of various fluid properties
			BTCVE302P.2	Comprehend and estimate various forces acting on partially and fully submerged bodies
			BTCVE302P.3	Evaluate the importance of various parameters on the fluid motion.
			BTCVE302P.4	Know various flow measuring devices with their practical applications

			BTCVE302P.5	Illustrate the concept of impulse momentum principle, dimensional analysis and model analysis of a fluid phenomenon
4	BTCVE303T	SOLID MECHANICS	BTCVE303T.1	Understand the behaviour of materials under different stress and strain conditions.
			BTCVE303T.2	Evaluate and draw shear force diagram and bending moment diagram and their relation.
			BTCVE303T.3	Formulate the bending and shear stresses equations and able to draw bending and shear stress diagrams.
			BTCVE303T.4	Formulate slope and Deflection equations for beams subjected to various loads by Macauleys method
			BTCVE303T.5	Analyze and Evaluate the torsion in circular section, Direct and Bending Stresses
5	BTCVE303P	SOLID MECHANICS	BTCVE303P.1	Understand the behaviour of materials under different stress and strain conditions.
			BTCVE303P.2	Evaluate and draw shear force diagram and bending moment diagram and their relation.
			BTCVE303P.3	Formulate the bending and shear stresses equations and able to draw bending and shear stress diagrams.
			BTCVE303P.4	Formulate slope and Deflection equations for beams subjected to various loads by Macauleys method
			BTCVE303P.5	Analyze and Evaluate the torsion in circular section, Direct and Bending Stresses
6	BTCVE304T	GEOTECHNICAL ENGINEERING	BTCVE304T.1	Find the index and engineering properties of the soil.
			BTCVE304T.2	Determine properties & demonstrate interaction between water and soil.
			BTCVE304T.3	Analyze and compute principles of compaction and consolidation settlements of soil.

			BTCVE304T.4	Ability to analyze to calculate bearing capacity, earth pressure and foundation settlement.
			BTCVE304T.5	Study and identify different type's natural materials like rocks & minerals and soil.
7	BTCVE304P	GEOTECHNICAL ENGINEERING	BTCVE304P.1	Find the index and engineering properties of the soil.
			BTCVE304P.2	Determine properties & demonstrate interaction between water and soil.
			BTCVE304P.3	Analyze and compute principles of compaction and consolidation settlements of soil.
			BTCVE304P.4	Ability to analyze to calculate bearing capacity, earth pressure and foundation settlement.
			BTCVE304P.5	Study and identify different type's natural materials like rocks & minerals and soil.
8	BTCVE305T	BUILDING CONSTRUCTION & ELEMENTARY BUILDING	BTCVE305T.1	Identify components of a building
			BTCVE305T.2	Differentiate and identify types of building materials.
			BTCVE305T.3	Select appropriate material for building construction
			BTCVE305T.4	Plan various construction related activities and their quality control.
			BTCVE305T.5	Know & identify the latest techniques and materials used
9	BTCVE303P	BUILDING CONSTRUCTION & ELEMENTARY BUILDING	BTCVE303P.1	Identify components of a building
			BTCVE303P.2	Differentiate and identify types of building materials.

			BTCVE303P.3	Select appropriate material for building construction
			BTCVE303P.4	Plan various construction related activities and their quality control.
			BTCVE303P.5	Know & identify the latest techniques and materials used
10	BTCVE306T	EFFECTIVE TECHNICAL COMMUNICATION	BTCVE306T.1	Participate effectively in groups with emphasis on listening and meta cognitive thinking
			BTCVE306T.2	Prepare memorandum and report
			BTCVE306T.3	Deliver an effective oral presentation.
			BTCVE306T.4	Acquire public speaking skills handling the audience professionally
			BTCVE306T.5	Analyze causes of deterioration of concrete components

Fourth Semester Civil Engineering

1	BTCVE401T	CONCRETE TECHNOLOGY	BTCVE401T.1	Think logically for development Concrete technology application in field of Civil Engineering
			BTCVE401T.2	Gain an experience in the implementation of Concrete Materials on Engineering concepts which are applied on Construction Fields
			BTCVE401T.3	Understand the process of mix design of concrete.
			BTCVE401T.4	Differentiate special concrete from conventional concrete.
			BTCVE401T.5	Analyze causes of deterioration of concrete components

2	BTCVE402T	STRUCTURAL ANALYSIS	BTCVE402T.1	Apply knowledge to analyse determinate and indeterminate structures.
			BTCVE402T.2	Apply knowledge to perform analysis of beams and frames using Slope Deflection Method and Moment Distribution Method.
			BTCVE402T.3	Apply knowledge of Influence Line Diagram to analyse structural members for rolling loads.
			BTCVE402T.4	Apply knowledge of Direct Stiffness Method to analyse Beams and Plane Frames.
			BTCVE402T.5	Apply knowledge of Direct Stiffness Method to formulate Stiffness Matrix, Transformation Matrix, Load Matrix to analyse Plane Truss.
3	BTCVE402P	STRUCTURAL ANALYSIS	BTCVE402P.1	Apply knowledge to analyse determinate and indeterminate structures.
			BTCVE402P.2	Apply knowledge to perform analysis of beams and frames using Slope Deflection Method and Moment Distribution Method.
			BTCVE402P.3	Apply knowledge of Influence Line Diagram to analyse structural members for rolling loads.
			BTCVE402P.4	Apply knowledge of Direct Stiffness Method to analyse Beams and Plane Frames.
			BTCVE402P.5	Apply knowledge of Direct Stiffness Method to formulate Stiffness Matrix, Transformation Matrix, Load Matrix to analyse Plane Truss.
4	BTCVE403T	ENVIRONMENTAL ENGINEERING	BTCVE403T.1	Have knowledge of characteristics of water,drinking water standards and necessity of treatment.
			BTCVE403T.2	Design various units of conventional water treatment plant.
			BTCVE403T.3	Understand the characteristics of waste water, necessity of treatment, types of treatment processes
			BTCVE403T.4	Equip with the basic knowledge related to design of waste water treatment

			BTCVE403T.5	Understand of significance of air pollution, solid waste , climate change, geo environment etc
5	BTCVE403P	ENVIRONMENTAL ENGINEERING	BTCVE403P.1	Have knowledge of characteristics of water,drinking water standards and necessity of treatment.
			BTCVE403P.2	Design various units of conventional water treatment plant.
			BTCVE403P.3	Understand the characteristics of waste water, necessity of treatment, types of treatment processes
			BTCVE403P.4	Equip with the basic knowledge related to design of waste water treatment
			BTCVE403P.5	Understand of significance of air pollution, solid waste , climate change, geo environment etc
6	BTCVE404T	TRANSPORTATION ENGINEERING	BTCVE404T.1	Define and describe different objectives and requirements of Highway Development and Planning, Alignments.
			BTCVE404T.2	Explain, Discriminate and Design various Geometric Features of Highways & Pavement Design
			BTCVE404T.3	Understand, analyze, apply and evaluate the parameters of Traffic Engineering.
			BTCVE404T.4	Explain and describe various terms in railway engineering and should be able to explain, discriminate and design various geometric features of railway track.
			BTCVE404T.5	Understand the aircraft characteristics and terminal area functions, analyze, and evaluate the basic runway length, orientation of runway.
7	BTCVE404P	TRANSPORTATION ENGINEERING	BTCVE404P.1	Determine the various properties of aggregates
			BTCVE404P.2	Determine the various properties of bitumen
			BTCVE404P.3	Determine the various properties of soil subgrade

8	BTCVE405T	SURVEYING AND GEOMATICS	BTCVE405T.1	Measure length and bearing of lines using various instruments and calculate area of given field.
			BTCVE405T.2	Use the theodolite to measure angle and distances for traversing also identify and correct the errors in traverse. Design and lay-out the various types of curves.
			BTCVE405T.3	To carry out levelling and contouring also able to determine volume of earthwork.
			BTCVE405T.4	Use modern instrument like Total work station , GPS, DGPS for surveying and able to prepare maps in CAD
			BTCVE405T.5	Use Remote Sensing and Geographical Information System(GIS), UAV Drone and LiDAR Survey.
9	BTCVE405P	SURVEYING AND GEOMATICS	BTCVE405P.1	Measure length and bearing of lines using various instruments and calculate area of given field.
			BTCVE405P.2	Use the theodolite to measure angle and distances for traversing also identify and correct the errors in traverse. Design and lay-out the various types of curves.
			BTCVE405P.3	To carry out levelling and contouring also able to determine volume of earthwork.
			BTCVE405P.4	Use modern instrument like Total work station , GPS, DGPS for surveying and able to prepare maps in CAD
			BTCVE405P.5	Use Remote Sensing and Geographical Information System(GIS), UAV Drone and LiDAR Survey.

Fifth Semester of Civil Engineering

1	BTCVE501T	Hydraulics Engineering	BTCVE501T.1	Understand the concepts related to boundary layer theory and determination of drag and lift forces
			BTCVE501T.2	Apply the knowledge of theories and equations of pipe flow in analyzing and designing the pipe network systems and to discuss effects of water hammer pressures.
			BTCVE501T.3	Use the concepts of uniform and critical flow through open channels, design of efficient channel sections and application of specific energy concept.

			BTCVE501T.4	Understand gradually varied flow analysis and its computation, and its application in open channel flow.
			BTCVE501T.5	Understand and apply basics principles related to turbines & Pumps in water Resources planning
2	BTCVE501 P	Hydraulics Engineering	BTCVE501P.1	Understand the concepts related to boundary layer theory and determination of drag and lift forces
			BTCVE501P.2	Apply the knowledge of theories and equations of pipe flow in analyzing and designing the pipe network systems and to discuss effects of water hammer pressures.
			BTCVE501P.3	Use the concepts of uniform and critical flow through open channels, design of efficient channel sections and application of specific energy concept.
			BTCVE501P.4	Understand gradually varied flow analysis and its computation, and its application in open channel flow.
			BTCVE501P.5	Understand and apply basics principles related to turbines & Pumps in water Resources planning
3	BTCVE502 T	Reinforced Cement Concrete Designs	BTCVE502T.1	Understand the fundamental concepts of working stress method as per IS 456- 2000 and Pre-stressed concrete method.
			BTCVE502T.2	Apply the fundamental concepts of limit state method on limit state of serviceability
			BTCVE502T.3	Analyze the fundamental concepts of limit state of collapse in flexure, Shear & Bond as per IS 456-2000.
			BTCVE502T.4	Evaluate the fundamental concepts of limit state of collapse in compression and design of footing as per IS 456-2000.
			BTCVE502T.5	Design of Simply supported Two-way slab
4	BTCVE503 T	Civil Engineering Materials, Testing and Evaluation	BTCVE503T.1	Evaluate the role of materials in Civil Engineering
			BTCVE503T.2	Know the mechanical behaviour and properties of steel and concrete by standard testing procedures for identifying their performance

			BTCVE503T.3	Explain special materials, composite materials and use of new techniques in constructions for satisfying the future needs of industry.
			BTCVE503T.4	Exposure to a variety of established material testing procedures/techniques and the relevant codes of practice
			BTCVE503T.5	Evaluate and write a technical laboratory report.
5	BTCVE503 P	Civil Engineering Materials, Testing and Evaluation	BTCVE503P.1	Evaluate the role of materials in Civil Engineering
			BTCVE503P.2	Know the mechanical behaviour and properties of steel and concrete by standard testing procedures for identifying their performance
			BTCVE503P.3	Explain special materials, composite materials and use of new techniques in constructions for satisfying the future needs of industry.
			BTCVE503P.4	Exposure to a variety of established material testing procedures/techniques and the relevant codes of practice
			BTCVE503P.5	Evaluate and write a technical laboratory report.
6	BTCVE504 T	Professional Practice, Law &Ethics	BTCVE504T.1	Understand basic purpose of profession, professional ethics and various moral and social issues.
			BTCVE504T.2	Analyse various moral issues and theories of moral development
			BTCVE504T.3	Realize their roles of applying ethical principles at various professional levels
			BTCVE504T.4	Identify their responsibilities for safety and risk benefit analysis.
			BTCVE504T.5	understand their constructive roles in dealing various global issues
7	BTCVE505 T	Elective – I (Advanced Structural Analysis)	BTCVE505T.1	Compute deflections in two dimensional structures using Strain energy method

			BTCVE505T.2	Understand response of long columns
			BTCVE505T.3	Use the approximate method for analysis of multi-storied frame structures
			BTCVE505T.4	Understand Flexibility matrix method and application of column analogy
			BTCVE505T.5	Understand the concepts related to structural dynamics& finite element method
8	BTCVE505 T	Ground Water Hydrology (Elective-I)	BTCVE505T.1	Define groundwater and itsoccurrences, classify the aquifers and illustrate aquifer properties
			BTCVE505T.2	Analyse the comprehensive hydrological flow systems in groundwater systems
			BTCVE505T.3	Perform detailed groundwater balances, interpreting and working with the concepts of groundwater recharge, storage, and discharge
			BTCVE505T.4	Interpret the steady-state and transient groundwater flow processes and their physical description
			BTCVE505T.5	Solve the groundwater management problems
9	BTCVE505 T	Geo Environmental Engineering (Elective-I)	BTCVE505T.1	Deal with geo-environmental engineering problems
			BTCVE505T.2	Utilize waste in Geotechnical applications
			BTCVE505T.3	Design Landfill & Mange leachate and landfill gas
			BTCVE505T.4	Do investigation on contaminated site and soil remediation
			BTCVE505T.5	Assess variation in engineering properties of soil due to change in environment

10	BTCVE505T	Geo Synthetics Engineering (Elective-I)	BTCVE505T.1	To understand types of geosynthetics and its techniques to use properly in suitable construction site.
			BTCVE505T.2	Understand the different functions of Geosynthetics .
			BTCVE505T.3	Understand the applications of geosynthetics in Civil engineering field.
			BTCVE505T.4	Study and identify about various reinforced soil structures.
			BTCVE505T.5	Understand reinforced soil embankments.
11	BTCVE505T	Advanced Surveying (Elective-I)	BTCVE505T.1	Understand RemoteSensing, terms involved in Remote Sensing and its applications.
			BTCVE505T.2	Apply drone and LiDAR technology for surveying
			BTCVE505T.3	Process digital images and interpret images using different tools.
			BTCVE505T.4	Understand Geographical concepts and terminology involved in GIS and its Applications.
			BTCVE505T.5	HandleGPS and DGPS for surveying
12	BTCVE505T	Advanced Building Materials (Elective-I)	BTCVE505T.1	Understand the structural, physical and long term performance of building materials used in construction.
			BTCVE505T.2	Understand special mortars and admixtures used in Civil engineering applications.
			BTCVE505T.3	Understand the properties of Ceramic materials in construction projects.
			BTCVE505T.4	Understand the uses of polymeric materials in construction.

			BTCVE505T.5	Understand green building concept and materials.
13	BTCVE506T	Climate Change and its Mitigation (Elective- II)	BTCVE506T.1	To be able to understand the problem of economics of energy – environmental interaction with respect to global climate change
			BTCVE506T.2	To be in a position to analysis Green house effect
			BTCVE506T.3	To be in a position to analyze impact of climate change
			BTCVE506T.4	To be in a position to understand the clean technology and alternate energy sources
			BTCVE506T.5	To demonstrate in producing research/project report on mitigation strategies for global climate change.
14	BTCVE506T	Advanced Concrete Structure (Elective-II)	BTCVE506T.1	Understand the behaviour and failure modes of different RC structural members
			BTCVE506T.2	Analyze and apply the results in designing various RC structural members.
			BTCVE506T.3	Apply the knowledge and skills in practical problems
			BTCVE506T.4	Understand the relevant software and use the same in the analysis and design of RC members.
15	BTCVE506T	Advanced Concrete Technology (Elective-II)	BTCVE506T.1	Think logically for development Concrete technology application in field of Civil Engineering
			BTCVE506T.2	Differentiate special concrete from conventional concrete Gain an experience in the implementation of Concrete Materials on Engineering concepts which are applied on Construction Fields
			BTCVE506T.3	Understand the process of mix design of concrete.
			BTCVE506T.4	Gain an experience in the implementation of Concrete Materials on Engineering concepts which are applied on Construction Fields.

				To Understand the various factors affecting the concrete and Advanced Non- Destructive Testing Methods.
			BTCVE506T.5	
16	BTCVE506T	Earth Retaining Structures (Elective-II)	BTCVE506T.1	Think logically for mechanism of earth retaining structures.
			BTCVE506T.2	Differentiate different types of retaining wall and Understand the engineering concepts of stability of retaining walls.
			BTCVE506T.3	Understand about sheet pile and cofferdam and best suitable techniques for construction.
			BTCVE506T.4	Gain an experience in from historical failures of geotechnical structures.
			BTCVE506T.5	Gain the knowledge of effect of water table on slopes.
17	BTCVE506T	Flood Control and Drainage Engineering (Elective-II)	BTCVE506T.1	Understand the role and responsibility of engineers in Flood Mitigation.
			BTCVE506T.2	Understand the role and responsibility of engineers in Estimation of Design Flood
			BTCVE506T.3	Learn and apply the knowledge of GIS, remote Sensing in Natural Hazard Mitigation.
			BTCVE506T.4	Apply the Concept in Operation and Maintenance of Urban Drainage System.
			BTCVE506T.5	Apply the knowledge of pattern of Drainage system at Irrigation area.
18	BTCVE506T	Railway Engineering (Elective-II)	BTCVE506T.1	Explain Components of Railway Track, different Railway Gauges
			BTCVE506T.2	Design track Gradients as per given requirements
			BTCVE506T.3	Discuss various Types of Track Turnouts

			BTCVE506T.4	Explain Interlocking and modern signal system
			BTCVE506T.5	Describe Surface Defects on Railway Track and Their Remedial Measures
19	BTCVE507 P	Industrial Training & Professional Skill Training	BTCVE507P.1	Understand organizational skills & professional practices
			BTCVE507P.2	Interpret the communication skills of organizational members with each other
			BTCVE507P.3	Analyze the structural problems by using STADD.PRO
			BTCVE507P.4	Design the structural members by using STADD.PRO
20	BTCVE508 AU	Organizational Behaviour	BTCVE508AU.1	Understand the concept and importance of organizational behaviour.
			BTCVE508AU.2	Acquire the knowledge of interpersonal behaviour and transaction analysis
			BTCVE508AU.3	Know different traits and theories of personality
			BTCVE508AU.4	Analyze the importance of motivation in organization and types of leadership

Sixth Semester of Civil Engineering

1	BTCVE601 T	Estimating and Costing	BTCVE601T.1	Prepare the preliminary estimate for administrative approval & technical sanction for a civil engineering project.
			BTCVE601T.2	Write the specification of the works to be undertaken, prepare the tender documents, fill the contracts and make use of knowledge of different contract submission & opening in awarding the work to the contractor.
			BTCVE601T.3	Use the concept of SD, EMD, MAS, Running Bill, Final Bill during the entire project

			BTCVE601T.4	Use the technique of Rate analysis in estimating the exact cost of material & manpower and hence the entire project.
			BTCVE601T.5	Estimate the bill of quantities using different techniques of preliminary & detailed estimation of buildings & roads & Arrive the exact value of the asset (movable & immovable) using ~~different Valuation techniques~~
2	BTCVE602T	Construction Engineering and Management	BTCVE602T.1	Get themselves acquainted with various economic and managerial aspects of construction industry
			BTCVE602T.2	Understand the tools and techniques of economic analysis for improving their decision making skills
			BTCVE602T.3	Analyze the structure of market and effects of inflation with special reference to construction industry
			BTCVE602T.4	Understand the importance of marketing management and its effect on construction industry
			BTCVE602T.5	Acquire financial acumen for construction business
3	BTCVE604T	Prestressed Concrete (Elective-III)	BTCVE604T.1	Understand the behaviour of pre-stressed concrete.
			BTCVE604T.2	Design of the pre-stressed concrete structures.
			BTCVE604T.3	Understand the knowledge of basic theories and fundamental behaviour of prestress concrete.
			BTCVE604T.4	Perform the analysis and design of pre-stress elements.
			BTCVE604T.5	Apply the fundamental knowledge to the solution of practical problems.
4	BTCVE604T	Urban Transport Planning (Elective III)	BTCVE604T.1	Explain the characteristic of urban transportation, structure of urban transportation and classification of urban roads.
			BTCVE604T.2	Describe the objectives of transportation planning, data collection for planning and environmental impact analysis.

			BTCVE604T.3	Explain the process of travel demand forecasting & need for interation in different modes of transportation.
			BTCVE604T.4	Describe the use of intelligent Transport System and need to accommodate non- motorized transports.
5	BTCVE604T	Soil Dynamics (Elective-III)	BTCVE604T.1	Understand basics of soil dynamics, theory ofvibration, propagation of body waves and surface wavesthrough soil.
			BTCVE604T.2	Understand different laboratory and field tests to determine dynamic soil properties required for design purpose
			BTCVE604T.3	Understand liquefaction mechanism and evaluation of liquefaction potential studies by various tests
			BTCVE604T.4	Understand the general requirements of machine foundation, and criteria for its design.
			BTCVE604T.5	Understand analysis & design of different types of Machine foundation required in the field
6	BTCVE604T	Repairs & Rehabilitation of Civil Engineering Structures	BTCVE604T.1	Explain deterioration of concrete in structures
			BTCVE604T.2	Carryout analysis using NDT and evaluate structures
			BTCVE604T.3	Assess failures and causes of failures in structures
			BTCVE604T.4	Carryout Physical evaluation and submit report on condition of the structure
			BTCVE604T.5	Carryout analysis of structures and take preventive action as per conditions & Requirement
7	BTCVE604T	Water Transmission and Distribution Systems (Elective-	BTCVE604T.1	Understanding the various head loss formula used for water distribution design and also know the methodology of optimal diameter of pumping main
			BTCVE604T.2	Estimation of storage capacity of a distribution reservoir and also to understand the utility of various appurtenance used in WDN

			BTCVE604T.3	Understand the concepts of various methods of analysis of WDN
			BTCVE604T.4	Understanding various techniques of the optimal planning of water distribution network
			BTCVE604T.5	Implementation of various methods of optimal water distribution network design
8	BECVE605T	Basics of Civil Engineering (Open Elective-I)	BECVE605T.1	Understand the building components and type of soil used for construction
			BECVE605T.2	Understand the used of various types of building materials
			BECVE605T.3	Understand the various equipment's used for surveying and role of transportation
			BECVE605T.4	Understand the role of water in environment and disposal methods of waste
			BECVE605T.5	Understand the used of instrument in Civil Engineering
			Seven Semester of Civil Engineering	
1	BTCVE701T	Design of Steel Structure	BTCVE701T.1	Use the knowledge of structural properties in assessing its strength and understand design philosophy.
			BTCVE701T.2	Apply the knowledge of various techniques in analysing and design the members subjected to axial loading.
			BTCVE701T.3	Make use of knowledge of analysis in structural planning and design of various components of building subjected to bending.
			BTCVE701T.4	Apply engineering concept to design members subjected to complex nature of loading.
			BTCVE701T.5	Make use of knowledge to design footings.

2	BTCVE506P	Project Work Phase-I	BTCVE506P.1	Understand organizational skills & professional practices
			BTCVE506P.2	Interpret the communication skills of organizational members with each other
			BTCVE506P.3	Collection of data for analyze/design the Civil Engineering problem by using appreciate methodology in a team work.
3	BTCVE701T	Sustainable Resource Management (Elective IV)	BTCVE701T.1	To be able to understand the various available natural resources with their objectives, demand and Social dimensions related to the sustainability.
			BTCVE701T.2	To be able to understand the various available land, soil and water resources with their objectives, impacts, renewal and management
			BTCVE701T.3	To be in a position to understand various Conventional and Non-renewable Energy Resources
			BTCVE701T.4	To be in a position to understand the forest and mineral resources
			BTCVE701T.5	To be in a position to understand the Natural Resource Conservation system
4	BTCVE702T	Advanced RCC Design (Elective-IV)	BTCVE702T.1	Understand the conceptual design of overhead circular service reservoirs.
			BTCVE702T.2	Analysis and design of Highway Bridge: Slab type and Girder type
			BTCVE702T.3	Analyze and Design building frames using Limit state Method.
			BTCVE702T.4	Select the parameters in beam theory for design cylindrical shells
			BTCVE702T.5	Design Silos using Limit state Method.
5	BTCVE702T	Advance Soil Engineering (Elective-IV)	BTCVE702T.1	Estimate the amount of consolidation and settlement and time required for settlement under a given load.

			BTCVE702T.2	Understand the effects of seepage on the stability of structures and calculate stresses that influence soil behavior.
			BTCVE702T.3	Ability to analyze the stability of natural slopes safety and sustainability of the slopes, design of retaining structures, reinforced earth wall, etc.
			BTCVE702T.4	Understand basics principles of flow and soil permeability through porous media, Construct flow nets for water flow calculations.
			BTCVE702T.5	Design deep foundation systems under different loading and soil conditions.
6	BTCVE702 T	Design of Hydraulic Structures (Elective-IV)	BTCVE702T.1	Understanding the design of dam section and its usefullness.
			BTCVE702T.2	To know the types of canal, canal headworks, cross-drainage and canal regulator works
			BTCVE702T.3	Application of the canal, dam and spillway in civil engineering structures
			BTCVE702T.4	Be able to select the type of storage works, analysis, design of various components part of diversion head works
			BTCVE702T.5	To know the concept, analysis, design and field application of various anal structures.
7	BTCVE702 T	Advanced Traffic Engineering & Management (Elective-IV)	BTCVE702T.1	Students should be able to Define and describe various traffic studies and traffic characteristics
			BTCVE702T.2	Students should be able to describe terms related to highway capacity and have knowledge of statistical tools in traffic engineering
			BTCVE702T.3	Students should be able to explain various theories related to traffic flow
8	BTCVE702 T	Building Construction Practices (Elective – IV)	BTCVE702T.1	Explain classification of Building as per NBC and building component & its function
			BTCVE702T.2	Explain different types of foundations & related activities as per requirement

			BTCVE702T.3	Carryout construction of sub structure as per conditions & requirement
			BTCVE702T.4	Carryout construction of super structure as per conditions & requirement
			BTCVE702T.5	Carryout building maintenance work as per conditions & requirement
9	BTCVE703T	Advance Foundation Engineering (Elective-v)	BTCVE703T.1	Analyze the bearing capacity of shallow foundations
			BTCVE703T.2	Analyse and design pile foundations.
			BTCVE703T.3	Evaluate the importance of raft foundation and principles of design for buildings and tower structures
			BTCVE703T.4	Analyse and design Sheet piles and cofferdams.
			BTCVE703T.5	Students should be able to understand the concept of foundations in expansive soils
10	BTCVE703T	Air Pollution & Solid Waste Management (Elective-V)	BTCVE703T.1	Students will be able to understand different aspects of air pollutants, its sources and effects on man & materials and Meteorological parameters
			BTCVE703T.2	Students will be able to understand methods of air sampling &design equipments for air pollution to reduce its impact on environment
			BTCVE703T.3	Students will be able to understand problems arriving in handling large amount of solid waste generated
			BTCVE703T.4	Students will be able to understand problems arriving in its collection, transportation, and processing&to design safe collection and disposal methods
			BTCVE703T.5	Students will be able to learn emerging technologies for air pollution control
11	BTCVE703T	wer Engineering (Ele	BTCVE703T.1	To understand about the sources of water power and estimation of its potential

			BTCVE703T.2	To learn the concept, design, investigation of power canals and its components
			BTCVE703T.3	To understand the concept, design, investigation about various parts of power units.
			BTCVE703T.4	To understand the concept, investigation about various parts of a power house.
			BTCVE703T.5	To impart the knowledge about electrical aspects of power unit and understand the importance of these items.
12	BTCVE703T	ge Engineering (Electiv	BTCVE703T.1	To analyze the functional utility of bridges and their components.
			BTCVE703T.2	To determine the forces acting on bridges and to calculate bending moment, shear force etc.
			BTCVE703T.3	To understand the behavior of components of bridge due to load and able to design it for safety and serviceability.
			BTCVE703T.4	To understand the support conditions, the functional utility and use of bearings.
13	BTCVE703T	Precast and Modular Construction Practices (Elective-V)	BTCVE703T.1	Give knowledge of factors to be considered in the design of prestressed concrete structures
			BTCVE703T.2	Give knowledge of the design and manufacturing of Finnish precast concrete products
			BTCVE703T.3	Understand the difference between pre- and post- tensioned systems for structural behaviour
			BTCVE703T.4	Learn to consider specific features of precast concrete structures: connections, stability and prevention of progressive collapse, ductility
			BTCVE703T.5	Learn to consider the influence of time- dependency of materials on structural reliability
14	BTCVE704T	Water & Wastewater Treatment (Elective-VI)	BTCVE704T.1	Understand the process and design components of water treatment such as Aeration, coagulation-flocculation and Sedimentation

			BTCVE704T.2	Understand the process and design the components of water treatment such as Filtration, Disinfection
			BTCVE704T.3	Understand the various sources characteristics and disposal methods of wastewater
			BTCVE704T.4	Understand and design the different preliminary and primary waste-water treatment
			BTCVE704T.5	Understand and design the different Secondary waste-water treatment
15	BTCVE704T	ineering Geology (EL	BTCVE704T.1	Apply engineering geological concepts and approaches on rock engineering projects
			BTCVE704T.2	Explain soil profile, geo-hydrological characters of various rock formations and necessity of geological studies in water conservation.
			BTCVE704T.3	Synthesize and Interpret the geologic data to establish the geological framework needed for design and construction of underground openings
			BTCVE704T.4	Validate the suitability of rocks based on mechanical properties, R.Q.D. and geophysical exploration
			BTCVE704T.5	Illustrate the suitability of proposed alignments for tunnels and bridges on the basis of Geological investigations.
16	BTCVE704T	Resistant Structure(E	BTCVE704T.1	Understand the philosophy of earthquake resistant design.
			BTCVE704T.2	Understand the concept of various effects on structure due to earthquake.
			BTCVE704T.3	Evaluate seismic forces for various structures as per relevant Indian standards
			BTCVE704T.4	Design and ductile detailing of structures for seismic resistance as per Indian standards
			BTCVE704T.5	Apply the concepts of repair and rehabilitation of earthquake affected structures

17	BTCVE704T	ivil In Engineering (E	BTCVE704T.1	Understand various testing methods of Failed Structures
			BTCVE704T.2	Understand the aspects of failures connected with various structural systems and materials
			BTCVE704T.3	Plan the strategic measures against failures.
			BTCVE704T.4	Can write the legal and technical report of the failure in lucid manner
			BTCVE704T.5	To impart knowledge about structural failures
18	BTCVE704T	on Management (Elect	BTCVE704T.1	Discussion of various principles of irrigation management
			BTCVE704T.2	Study of various methods of canal section design and approaches of optimal canal design
			BTCVE704T.3	Estimation of seepage losses through a canal system and criteria to minimise it
			BTCVE704T.4	Involvement of various stake holders of irrigation system and efficient functioning for the better efficiency of the system
			BTCVE704T.5	Knowing various policies and attempt made by state and central Government for the proper functioning of irrigation system
19	BTCVE704T	nalysis & Design (El	BTCVE704T.1	Analyze the stresses and strains in a flexible pavement using multi-layered elastic theory
			BTCVE704T.2	Design a flexible pavement using IRC, Asphalt Institute, and AASHTO methods.
			BTCVE704T.3	Analyze stresses and strains in a rigid pavement using Westergaard's theory.
			BTCVE704T.4	Design a rigid pavement using IRC, and AASHTO methods

			BTCVE704T.5	Comprehend the concept of strengthening of existing pavements and pavement management system
Eight Semester of Civil Engineering				
1	BTCVE801T	Construction Method and Equipment Management	BTCVE801T.1	Should have the knowledge about construction industry and construction projects.
			BTCVE801T.2	Should have knowledge about project organization.
			BTCVE801T.3	Should have knowledge about construction planning methods.
			BTCVE801T.4	Should have knowledge about constructionlabour and equipment management.
			BTCVE801T.5	Should have knowledge about construction materials management
2	BTCVE802T	Land Surveying & M	BTCVE802T.1	Know the basics of digital land surveying and its applications
			BTCVE802T.2	Handle the GPS for surveying and plot the details on map.
			BTCVE802T.3	Know the use of DGPS and its applications and advantages
			BTCVE802T.4	Use total station for land surveying and plotting the details
			BTCVE802T.5	Use advance software for mapping
3	BECVE803T	Introduction to Civil Engineering Profession (Open Elective-III)	BECVE803T.1	The course introduces the civil engineering profession and the degree programme to first year students and prospective students
			BECVE803T.2	The different disciplines of civil engineering are briefly explained, along with the pre-requisites, scope and opportunities

Sr. No	Subject Coad	Name of Subject	CO Coad	Course Outcomes
			BECVE803T.3	Career prospects and novel/emerging areas are also presented
			BECVE803T.4	This should be a compulsory first course in civil engineering to present the perspective for the undergraduate students
4	BTCVE804P	Project Work Phase-II	BTCVE804P.1	Analyze or Design the Civil Engineering problems by using appreciate methodology in a team work
			BTCVE804P.2	Interpret the communication skills of team members
			BTCVE804P.3	Use of Modern tools in the field of Civil Engineering

Department of Computer Enginnering

Course Outcomes

Third Semester Computer Engineeirng

Sr. No	Subject Coad	Name of Subject	CO Coad	Course Outcomes
1	BECME301T	Applied Mathematics-III	BECME301T.1	This Course is intended to introduced Integral Transform which afford mathematical devices through which solution of boundary value problem of Engineering can be obtained.
			BECME301T.2	Matrices which have been found to be of great utility in solving differential equation.
			BECME301T.3	The fundamental of Probability theory useful in engineering application
			BECME301T.4	To solve differential equation by various methods

			BECME301T.5	Solve difference equation by Z-transform method
2	BECME302T	Digital Electronics	BECME302T.1	Students will be able to represent numerical values in various number systems and perform number conversions between different number systems.
			BECME302T.2	Students will demonstrate the knowledge of:operation of logic gates (AND, OR, NAND, NOR, XOR, XNOR) Boolean algebra including algebraic manipulation/simplification and application of DeMorgan's theorems Karnaugh map
			BECME302T.3	Students will demonstrate the knowledge of operation of basic types of flip-flops, registers, counters, decoders, encoders, multiplexers, and de-multiplexers.
			BECME302T.4	Students will be able to analyze and design digital combinational circuits including arithmetic circuits (half adder, full adder, multiplier).
			BECME302T.5	Students will be able to analyze sequential digital circuits.
			BECME302T.6	Students will demonstrate knowledge of the nomenclature and technology in the area of memory devices: ROM, RAM, PROM
3	BECME302P	Digital Electronics Lab	BECME302P.1	Students will be able to represent numerical values in various number systems and perform number conversions between different number systems.
			BECME302P.2	Students will demonstrate the knowledge of: operation of logic gates (AND, OR, NAND, NOR, XOR, XNOR) Boolean algebra including algebraic manipulation/simplification and application of DeMorgan's theorems Karnaugh map reduction method
			BECME302P.3	Students will demonstrate the knowledge of operation of basic types of flip-flops, registers, counters, decoders, encoders, multiplexers, and de-multiplexers.
			BECME302P.4	Students will be able to analyze and design digital combinational circuits including arithmetic circuits (half adder, full adder, multiplier).
			BECME302P.5	Students will be able to analyze sequential digital circuits.

			BECME302P.6	Students will demonstrate knowledge of the nomenclature and technology in the area of memory devices: ROM, RAM, PROM
4	BECME303 T	Concepts in Computer Engineering	BECME303T.1	Understands the basic concepts of computer system.
			BECME303T.2	Understand the implementation and application of programming language.
			BECME303T.3	Understand different software's, and Open Source System
			BECME303T.4	Understand the basic concepts of Multimedia System and implementation of that in further research
5	BECME304 T	Programming Methodology and Data Structures	BECME304T.1	Design algorithmic solutions to simple problems and present their implementation in a functional programming language C.
			BECME304T.2	Understanding problem solving and programming methodology.
			BECME304T.3	Implement different data structures using dynamic memory
			BECME304T.4	Use appropriate data structure for solving various applications depending on behavioral properties.
6	BECME304 P	Programming Methodology and Data Structures Lab	BECME304P.1	Students will be able to implement the C program using basic constructs like arrays ,structures,storage classes and fuctions.
			BECME304P.2	Students will be able to implement and analyze the usage of sorting & searching algorithm .

			BECME304P.3	Students will be able to design applications using stacks & queues.
			BECME304P.4	Students will be able to perform various operations & applications on linked lists of different types.
			BECME304P.5	Students will be able to effectively use appropriate data structures like tree & graph and solve various applications depending on behavioral properties.
			BECME304P.6	
7	BECME305T	Introduction to Computer Network	BECME305T.1	Student will be able to understand different models used for study of computer networks and ability to identify different designs.
			BECME305T.2	Student will be able to understand how information is transmitted while moving through network and understand the different technologies and conversion methods used to improve the efficiency of communication.
			BECME305T.3	Students will be able to understand how to preserve the integrity of data communicated on network by making the transmission error free using some error free techniques.
			BECME305T.4	Students will be able to design and modify the routes to create interconnect networks.
			BECME305T.5	Students will be able to understand the various mechanisms to deliver the information from one process to another.
			BECME305T.6	Students will be able to understand the working of world wide web and electronic mail technologies.
8	BECME306T	Environmental Engineering -I (Audit Course)	BECME306T.1	Student will be able to use the techniques ,skill and modern engineering tools necessary for engg. Practice
			BECME306T.2	Student will able to understand impact of engineering solution in bglobal and social context.

9	BECME307P	Computer Lab-I	BECME307P.1	Understand, analyze and apply the role of languages like HTML, DHTML, CSS and protocols in the workings of the web and web applications
			BECME307P.2	Analyze a web page and identify its elements and attributes.
			BECME307P.3	Create web pages using HTML, DHTML and Cascading Styles sheets.
			BECME307P.4	Create dynamic web pages using HTML,CSS,DHTML.
			BECME307P.5	Create interactive web applications USING XML

Forth Semester Computer Engineering				
1	BECME401T	Discrete Mathematics and Group Theory	BECME401T.1	Some fundamental mathematical concepts and terminology
			BECME401T.2	How to produced graphical representation of discrete objects and binary relation on them
			BECME401T.3	With help of Combination solution to difference to be obtained
			BECME401T.4	Techniques for constructing mathematical proofs,illustrated by discrete mathematics examples
			BECME401T.5	
			BECME401T.6	

2	BECME402T	File Structure and Data Processing	BECME402T.1	Explain the importance of file structures in the Data Storage and Manipulation along with concepts of storing data on secondary storage.
			BECME402T.2	Analyze the conceptual difference between File Structure approach and data base approach.
			BECME402T.3	Know the operating system level aspects of file manipulation.
			BECME402T.4	Know the importance of data compression.
			BECME402T.5	Know some of the high-level file structures tools and recognize the related indexing techniques.
			BECME402T.6	Implement some of the learned techniques and concepts using C and C++ for solving various file management problems.
			BECME402T.7	Contributes to the industry using File structure concepts for related research work.
3	BECME403T	Microprocessor	BECME403T.1	To describe Microprocessor 8086 architecture.
			BECME403T.2	To describe instruction set of microprocessor 8086
			BECME403T.3	To analyze memory model and segmentation concept used in microprocessor 8086
			BECME403T.4	To analyze instruction set and to develop assembly language programs for 8086 microprocessors.
			BECME403T.5	To describe and to analyze achitecture and working of peripheral IC 8255

			BECME403T.6	To describe and to analyze achitecture and working of peripheral IC 8259
4	BECME403P	Microprocessor Lab	BECME403P.1	To study Microprocessor 8086 architecture.
			BECME403P.2	To study and to analyze instruction set of microprocessor 8086
			BECME403P.3	To analyze memory model and segmentation concept used in microprocessor 8086
			BECME403P.4	To analyze instruction set and to develop assembly language programs for 8086 microprocessors.
			BECME403P.5	To study and to analyze achitecture and working of peripheral IC 8255
			BECME403P.6	To study and to analyze achitecture and working of peripheral IC 8259
5	BECME404T	Numerical Computational Techniques	BECME404T.1	identify various mathematical problems and reformulate these in a way suitable for numerical treatment
			BECME404T.2	select a suitable numerical method for the treatment of the given problem
			BECME404T.3	motivate the choice of a method by describing its advantages and limitations
			BECME404T.4	Select an algorithm leading to efficient computation and implement this in a programming language.
			BECME404T.5	provide an estimate of the efficiency of the results

			BECME404T.6	
6	BECME405T	Object Oriented Methodology	BECME405T.1	Student will be able to define & describe the methodology that consists of traditional, structured analysis & design, information modeling, and object-oriented methodology classifications
			BECME405T.2	Students will be able to understand the features and concept of dynamic modelling.
			BECME405T.3	Students will be able to define and describe a Data Flow Diagram (DFD) and an Entity-Relationship Diagram (ERD), define and describe attributes, operations and relationships in an object-oriented methodology.
			BECME405T.4	Students will be able to describe the information system development and designs.
			BECME405T.5	Students will be able to understand the efficiency of objects design through inheritance and objectrepresentation.
			BECME405T.6	Students will be able to compare the object modelling, dynamic modelling and functional modelling.
7	BECME405P	Object Oriented Methodology Lab	BECME405P.1	distinguish object oriented development technique and structured development approach, and apply object oriented concepts in development of system
			BECME405P.2	analyze dynamic and functional aspect of the system and represent them diagrammatically.
			BECME405P.3	prepare object model and apply design optimizations in the development of system.
			BECME405P.4	identify phases involved in system design, modularize system into subsystems, components to represent architecture of system.

8	BECME406P	Computer Lab-II	BECME406P.1	Develop Structured COBOL Programs
			BECME406P.2	Understand and Use COBOL Verbs
			BECME406P.3	Develop COBOL programs using the available verbs
			BECME406P.4	Develop and Test COBOL print programs
			BECME406P.5	Develop and Test COBOL programs accessing different types of files
Fifth Semester Computer Engineering				
1	BECME501T	Theory of computation	BECME501T.1	Students will understand the concept of finite automaton and will be able to apply it to solve the computational problems.
			BECME501T.2	Students will understand the concept of regular expression and will be able to write regular grammar for the given regular expression.
			BECME501T.3	Students will understand the concept of context free grammar and push down automaton and will be able to apply it to solve the computational problems.
			BECME501T.4	Students will understand the concept of Turing machine and will be able to design Turing machine for the given specification.
			BECME501T.5	Students will understand the concept of Decidability and Undecidability and will be able to apply the concept to solve computational problems.
			BECME501T.6	Students will understand the concept of recursive function and will be able to apply the concept to solve computational problems.

2	BECME502T	computer architecutre organization	BECME502T.1	Studentswillbeabletounderstand the organization of a modern computer system, unsigned integer arithmetic, Booth's algorithm and Von-Neumann architecture.
			BECME502T.2	Studentswillbe able to understanddifferent addressing schemes, instruction cycles and pipelining concept. Moreover, they will have the knowledge of organization of Register and Processor.
			BECME502T.3	Studentswillbe familiar with the concept of bus architecture, instruction sequencing and register transfer. Beyond these they will have the knowledge of microinstructions and micro - program sequencing.
			BECME502T.4	Studentswillfamiliar with different types of memories, virtual memory concept and memory allocation schemes like paging and segmentation.
			BECME 502T.5	Studentswillbeabletounderstand the working principle of different I/O devices and direct memory access.
			BECME502T.6	Studentswillbe able to understand different types of processors, Vector Computations, Bus allocation Schemes. Moreover they will have the knowledge of non-uniform access and RISC-CISC architecture.
3	BECME503T	TCP/IP internet	BECME503T.1	Student will be able to understand different models used for study of computer networks, ability to identify different design and to describe the architecture of Internet.
			BECME503T.2	Student will be able to describe IP addressing and are able to design an internetwork with assigned addresses and NAT.
			BECME503T.3	Student will be able to describe the advance functions performed by the Internet protocol (IP),other supporting protocols and the inner working of interior protocols such as RIP, OSPF and BGP.
			BECME503T.4	Students will be able to understand the challenges involved in mobile communication using on the Internet and the possible solutions.
			BECME503T.5	Students will be able to describe the operations of TCP and its advanced features and measure and optimize the performance of TCP.
			BECME503T.6	Students will be able to understand and describe the configuration parameters with its application in Internet.

		TCP/IP internet LAB	BECME503P.1	Students will able to implement Intranet model using IPv4 address, classless CIDR address scheme and various network topologies using ICMP packet approach.
			BECME503P.2	Students will be able to develop program code for error detection and correction methods for Data Link layer of TCP model.
			BECME503P.1	Student will be able to analyze and develop a program for verification of IP level connectivity during troubleshooting TCP network & its resources.
			BECME503P.3	Student will able to design & experiment with the advance technologies and represent it in the form of network model using open source simulator..
			BECME503P.1	Student will able to design and demonstrate the various types of routing mechanisms between the Autonomous Systems in a Network.
			BECME503P.4	Student will be able to experiment and show the demonstration of Wireshark packet analyzer tool.
4	BECME504T	Computer Graphics	BECME504T.1	Understand the concepts of computer graphics, fundamental components and related software & hardware.
			BECME504T.2	Implement mathematical aspects & underlying algorithms for designing geometric shapes
			BECME504T.3	Discuss and use the concepts of computer graphics in application development of computer animation, interactive games, information visualization and business applications.
			BECME504T.4	Work in research areas in computer graphics and 3D graphics
5	BECME504P		BECME504P.1	Understand the concepts of computer graphics, fundamental components and related software & hardware.
			BECME504P.2	Implement mathematical aspects & underlying algorithms for designing geometric shapes

				development of computer animation, interactive games, information visualization and business applications demonstrate geometrical transformations.
		Computer Graphics LAB	BECME504P.3	development of computer animation, interactive games, information visualization and business applications demonstrate geometrical transformations.
			BECME504P.4	Create interactive graphics applications in C using one or more graphics application programming interfaces.
			BECME504P.5	possiable to Work in research areas in computer graphics and 3D graphics
6	BECME505T	Industrial Economics and Enterprenurship Development	BECME505T.1	understanding of the scope of an industrial economics and correlate it with current industrial scenario in manufacturing and service sect
			BECME505T.2	outline the relation betweenbusiness ,market and societywhich will be helpful for decision making in bus
			BECME505T.3	understand differentcost conceptsand concept related with indian economy which will help them to understand how the cost of product and prices of products are decided by manufacturers
			BECME505T.4	To understand significance of entrepreneurship and economic growth and would become aware aboutentrepreneurshipas a career option
			BECME505T.5	to know about variousfinancial agencies and government support systemsavailable in our country for supporting new entrepreneurs.
8	BECME506P	Computer Lab -III	BECME506P.1	Understand the format and use of objects.
			BECME506P.2	Understand basic input/output methods and their use.
			BECME506P.3	Understand object inheritance and its use.
			BECME506P.4	Understand development of JAVA applets vs. JAVA applications.

			BECME506P.5	Understand the use of various system libraries.
Sixth Semester Computer Engineering
1	BECME601T	System software	BECME601T.1	Student will understand the working of assembler and will be able to analyze assembly language program.
			BECME601T.2	Student will learn about micro instruction processor and its working with the assembler.
			BECME601T.3	Student will learn different sorting and searching techniques and its application.
			BECME601T.4	Student will learn different loading techniques and its design and implementation.
			BECME601T.5	Student will understand working of compiler
2	BECME602T	Design & Analysis of Algorithm	BECME602T.1	Analyze the asymptotic performance of algorithms.
			BECME602T.2	Demonstrate a familiarity with major algorithms and data structures.
			BECME602T.3	Apply important algorithmic design paradigms and methods of analysis.
			BECME602T.4	Synthesize efficient algorithms in common engineering design situations.
			BECME602T.5	Conduct the investigations of complex problems.

	BECME602 P		BECME602P.1	Students will be able to model the concept of Quick Sort and find the time complexity.
			BECME602P.2	Students will able to construct various sorting algorithms and find the time complexity.
			BECME602P.3	Students will be able to model the concept of Divide and Conquer Method and find the time complexity.
		Design & Analysis of Algorithm LAB	BECME602P.4	Students will able to construct the code to execute Minimum Spanning Tree and find its time complexity.
			BECME602P.5	Students will able to construct the code to execute Dynamic Programming concept and find its time complexity.
			BECME602P.6	Students will able to compare the classes P and NP and explain the significance of NP-Completeness.
3	BECME603 T		BECME603T.1	UnderstandfundamentalaspectsofDBMSandconceptsofstorage&processingofdatabases.
			BECME603T.2	Designdifferentdatabasemodelsandimplementthemusingrelational algebraandSQL.
			BECME603T.3	Criticizeadatabasedesignandimprovethedesignusingnormalization process.
		Database management System	BECME603T.4	Create,processandmodifythedatabasesusingPL/SQLandotherrelatedtools.
			BECME603T.5	Use the concepts of concurrency control, transaction management, scheduling, recovery while working in a database environment.
			BECME603T.6	Exposuretothebasics aboutdistributeddatabases&networkdatabaseswhichisusedforfurtherresearch workindatabasearea.

	BECME603P	Database management System lAB	BECME603P.1	Understand fundamental aspects of DBMS and concepts of storage & processing of databases.
			BECME603P.2	Design different database models and implement them using relational algebra and SQL.
			BECME603P.3	Criticize a database design and improve the design using normalization process.
			BECME603P.4	Create, process and modify the databases using PL/SQL and other related tools.
			BECME603P.5	Use the concepts of concurrency control, transaction management, scheduling, recovery while working in a database environment.
			BECME603P.6	Exposure to the basics about distributed databases & network databases which is used for further research work in database area.
4	BECME604T	Software Engineering & Project Management	BECME604T.1	distinguish software development techniques that can be applied based on the project requirements of project.
			BECME604T.2	understand and analyze project requirements, author a formal specification for a software system.
			BECME604T.3	understand and apply design process, architectural styles, steps for effective UI design
			BECME604T.4	understand and apply testing strategies in software development
			BECME604T.5	demonstrate the ability to manage a project including planning,scheduling and risk assessment/management
			BECME604T.6	identify specific components of a software design that can be targeted for reuse

5	BECME604P	Software Engineering & Project Management LAB	BECME604P.1	students would be able to apply software engineering principles during development of system.
			BECME604P.2	distinguish software development techniques that can be applied and implement appropriate technique based on the based on the project requirements
			BECME604P.3	analyze project requirements, author a formal specification for a software system.
			BECME604P.4	implement design process, architectural styles, steps for effective system design
6	BECME605T	Functional english	BECME605T	Be able to face competitive exams IELTS, TOEFL, CAT, etc . through learning functional grammar, vocabulary building, use of idiomatic expressions etc.
			BECME605T.2	Be able to make factual, analytical and interpretative comprehension of technical and non technical texts
			BECME605T.3	Be able to write job applications, resume, and be proficient in writing business letters, circulars, memoranda etc..
			BECME605T.4	Learn to write reviews, research project reports, project proposals, and other forms of technical writing like technical manuals etc.
			BECME605T.5	Understand the basics of interviews and face job interviews successfully.
7	BECME606P	Mini project &	BECME606P.1	Demonstrate a sound technical knowledge of their selected project topic.
			BECME606P.2	Undertake problem identification, formulation and solution.

		Industrial visit	BECME606P.3	Design and Analyse engineering solutions to problems.
			BECME605P.4	Implementation & testing of systems
			BECME605P.5	Communicate with engineers and the community at large in written an oral forms.
			BECME605P.6	Demonstrate the knowledge, skills and attitudes of a professional engineer.
Seventh Semester Computer Engineering
1	BECME701T	Operating System	BECME701T.1	identify the concept of Operating System.
			BECME701T.2	identify the services provided by Operating System.
			BECME701T.3	understand the internal structure of Operating System.
			BECME701T.4	Understand and solve problems involving process management, memory management as well as resource management.
2	BECME702T1		BECME702T1.1	Understand the fundamentals of microprocessor and microcontroller systems and interface.
			BECME702T1.2	Identify, formulate and solve problems by using the concept of microcontroller systems and interface.

			BECME702T1.3	Develop Assembly Language source code for applications that use I/O ports, timer and single/multiple interrupts.
		Advanced microprocessor & Microcontroller	BECME702T1.4	Analyse the instruction set of microprocessor and microcontroller..
			BECME702T1.5	Describe the fundamental features and operation of microprocessor and microcontroller.
			BECME702T1.6	Understand the fundamentals of Pentium.
3	BECME702P		BECME702P.1	Describe the advancements in architecture,memory management and privilege mechanisms of advanced microprocessors.
			BECME702P.2	Analyze the real mode and protected mode software architecture of IA-32 microprocessors.
		Advanced microprocessor & Microcontroller LAB	BECME702P.3	To analyze instruction set and to develop assembly language programs for IA-32 microprocessors.
			BECME702P.4	Interpret the hardware and software architecture of Pentium series microprocessors
			BECME702P.5	Analyze the architecture of Micro controllers.
			BECME702P.6	To analyze the instruction set and to develop assembly language programs of Micro controllers.
4	BECME703T		BECME703T.1	Student will able to study of unit provides students with a high-level understanding of how information security functions in an organization and able to identify the major types of threats to information security and the associated attacks. Students will
			BECME703T.2	Students will get the concepts of: Cryptography in information security with the help of symmetric and asymmetric encryption systems and study of unit provides knowledge of mathematical foundation required for various

		Information Assurance and Network Security	BECME703T.3	Students will get the concepts of key management and the concepts of digital signature and able to verify messages using well-known signature generation and verification algorithms.
			BECME703T.4	Students will get knowledge of SSL based solution against security threats and the concepts of intrusion detection system and get the knowledge of various protocols (Handshake, Record Layer, and Internet Key Exchange).
			BECME703T.5	Students will get the concept of password management, firewalls, software vulnerability (worms, virus, Trojans), countermeasures of software vulnerability and Electronic payment.
			BECME703T.6	Students will get the concepts of computer forensics and will have the knowledge of various investigative tools and Indian IT laws.
5	BECME703P	Information Assurance and Network Security LAB	BECME703P.1	Study of unit provides students with a high-level understanding of how information security functions in an organization and able to identify the major types of threats to information security and the associated attacks. Students will understand the various cipher
			BECME703P.2	Students will get the concepts of Cryptography in information security with the help of symmetric and asymmetric encryption systems and study of unit provides knowledge of mathematical foundation required for various cryptographic Algorithms.
			BECME703P.3	Students will get the concepts of key management and the concepts of digital signature and able to verify messages using well-known signature generation and verification algorithms.
			BECME703P.4	Students will get knowledge of SSL based solution against security threats and the concepts of intrusion detection system and get the knowledge of various protocols (Handshake, Record Layer, and Internet Key Exchange).
			BECME703P.5	Students will get the concept of password management, firewalls, software vulnerability (worms, virus, Trojans), countermeasures of software vulnerability and Electronic payment.
			BECME703P.6	Students will get the concepts of computer forensics and will have the knowledge of various investigative tools and Indian IT laws.
7	BECME704T(i)		BECME704T.1	To understand various soft computing techniques and differentiate between them.
			BECME704T.2	Apply multilayer Perceptron neural network training algorithm to develop Artificial neural network (ANN) based pattern classifiers and data predicators.

			BECME704T.3	Apply concept of Associative memory for pattern classification and recall.
		Soft computing	BECME704T.4	Apply self organization map and Adaptive Resonance theory to perform clustering operations of a given data sets.
			BECME704T.5	Understand basics of fuzzy set theory and representation of Fuzzy sets and Develop a fuzzy logic controller to perform simple control task on a given data set.
			BECME704T.6	Understand Concepts of Genetic Algorithms.Contributes to industry using Soft computing concepts ANN , Fl and GA and Hybrid models for related research work.
8	BECME705T		BECME705T.1	analyze and apply the feature and functionality of languages like HTML,XHTML, DHTML, CSS, XML, and protocols in the working of the web and web applications
			BECME705T.2	analyze and build dynamic web pages using JavaScript, AJAX (client side programming).
		Web Technologies	BECME705T.3	analyze and build interactive web applications using JSP, Java Servlets (Server side programming).
			BECME705T.4	analyze and create XML documents, DTD, applications using XML
			BECME705T.5	analyze and recognize need of internet related technologies, tools.
				analyze open source web technologies, use of cookies, security threats related to web.
Eighth Semester Computer Engineering				
1	BECME801T		BECME801T.1	Student will describe vi Editer and basics of shell scripting like use of variables and constants.

			BECME801T.2	Student will recognize use of sequence control control Instructions in shell scripting.
		UNIX & Shell Programming	BECME801T.3	Student will identify use of decision control Instructions in shell scripting.
			BECME801T.4	Student will be implement use of loop control Instructions in shell scripting.
			BECME801T.5	Student will be demonstrate use of case control Instructions in shell scripting. And appling filter and pipes.
			BECME801T.6	Student will Contribute to industry by using shell script for creating routines and programs
2	BECME801 P1		BECME801P1.1	Understand vi Editer and basics of shell scripting like use of variables and constants.
			BECME801P1.2	Understand use of sequence control control Instructions in shell scripting.
		UNIX & Shell Programming LAB	BECME801P1.3	Understand use of decision control Instructions in shell scripting.
			BECME801P1.4	Understand use of loop control Instructions in shell scripting.
			BECME801P1.5	Understand use of case control Instructions in shell scripting. And appling filter and pipes.
			BECME801P1.6	Contribute to industry by using shell script for creating routines and programs.
4	BECME802 T		BECME802T.1	Student will analyze components of distributed systems and challenges involved in development of it.

			BECME802T.2	Student will describe logical clock, physical clock synchronization and global state algorithms.
		Distributed System & Grid computing	BECME802T.3	Student will recognize concept of distributed file systems, distributed memory management, and issues involved in designing system.
			BECME802T.4	Student will be characterizeanalyze grid computing, models, protocols and challenges involved in development of it.
			BECME802T.5	Student will explore concept of message passing mechanism and interface to perform parallel computing
			BECME802T.6	Student will recognize concept of cloud computing, service models and deployment models.
5	BECME802 P5		BECME802P.1	analyze components of distributed systems and challenges involved in development of it.
			BECME802P.2	analyze logical clock, physical clock synchronization and global state algorithms.
		Distributed System & Grid computing LAB	BECME802P.3	recognize concept of distributed file systems, distributed memory management, and issues involved in designing system.
			BECME802P.4	analyze grid computing, models, protocols and challenges involved in development of it.
			BECME802P.5	explore concept of message passing mechanism and interface to perform parallel computing
			BECME802P.6	recognize concept of cloud computing, service models and deployment models.
6	BECME803 T1		BECME803T1. 1	Student will describe the working GSM architecture.

			BECME803T1.2	Student will analyze IEEE 802.11 protocol structuer.
		Wreless communication & Mobile Computing	BECME803T1.3	Student will define & gain MANET concepts and algorithms related to the Manet.
			BECME803T1.4	Student will be categorize the mobile transport and network layer.
			BECME803T1.5	Student will be able to analyze issues and challenges related to mobile networks.
			BECME803T1.6	Student will be able to study Wireless application protocol and blutooth technology.
8	BECME804T	Multimedia System	BECME804T.1	Student will describe different realisations of multimedia tools and the way in which they are used
			BECME804T.2	Student will recognize the structure of various software tools in Macintosh and Windows Platforms
			BECME804T.3	Student will identify and study different multimedia building block in detail i.e TEXT ,ANIMATION,SOUND,VIDIO,IMAGES
			BECME804T.4	Student will be categorize different Data compression Scheme for Vidio Compression ,Audio Compression .
			BECME804T.5	Student will be plan experiments to test user perception of multimedia tools
			BECME804T.6	Student will analyze and implement the different multimedia building block on world wide web.also deliver the multimedia project on CD and DVD and on the web .
10	BECME805P		BECME805T.1	Demonstrate a sound technical knowledge of their selected project topic.

		PROJECT	BECME805T.2	Undertake problem identification, formulation and solution.
			BECME805T.3	Design and Analyse engineering solutions to problems.
			BECME805T.4	Implementation & testing of systems
			BECME805T.5	Communicate with engineers and the community at large in written an oral forms.
			BECME805T.6	Demonstrate the knowledge, skills and attitudes of a professional engineer.