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Department of Civil Engineering	
PROGRAM OUTCOMES(POs)	
PO 1	Engineering knowledge: Graduates can apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to Civil Engineering related problems.
PO 2	Problem analysis: An ability to identify, formulate, review research literature, and analyze Civil engineering problems reaching substantiated conclusions using principles of mathematics and engineering sciences.
PO 3	Design/development of solutions: An ability to plan, analyse, design and implement engineering problems and design system components or processes to meet the specified needs.
PO 4	Conduct investigations of complex problems: An ability to use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid
PO 5	Modern tool usage: An ability to apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	The engineer and society: An ability to apply contextual knowledge to assess societal, legal issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	Environment and sustainability: An ability to understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	Ethics: An ability to apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	Individual and team work: An ability to function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings to accomplished a common goal.
PO 10	Communication: An ability to communicate effectively on engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, and make effective presentations
PO 11	Project management and finance: Ability to demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in
PO 12	Life-long learning: An ability to engage in independent and life-long learning in the broadest context of technological change.
THIRD & FOURTH SEMESTER B. TECH. CIVIL	
BECET301T	Applied Mathematics-III
CO301.1	Apply Fourier series in the analysis of periodic functions not in terms sine and cosine encountered in engineering problems
CO301.2	Solve Partial differential equations of first, higher and second order using elementary techniques; formulate mathematical models to simple problems of vibration of strings and beams in terms of Partial differential equations and solving with elementary solution techniques.
CO301.3	Learn the concept of finding maxima and minima of definite integral involving unknown function and its derivatives.
CO301.4	Learn Eigen value problem and its applications.
CO301.5	Learn to find an approximate solution of algebraic and transcendental equations, system of linear equations and first order ordinary differential equations by various Numerical Methods
CO301.6	Formulate simple optimization problem and learn to solve it by Graphical method and Simplex method.
BTCVE302T	Fluid Mechanics
After studying this subject, the students will be able to	
C302.1	Understand the importance and practical significance of various fluid properties
C302.2	Comprehend and estimate various forces acting on partially and fully submerged bodies
C302.3	Evaluate the importance of various parameters on the fluid motion.
C302.4	Know various flow measuring devices with their practical applications
C302.5	Illustrate the concept of impulse momentum principle, dimensional analysis and model analysis of a fluid phenomenon
BTCVE302T	Fluid Mechanics (Practical)
After the conduction of practicals will be able to perform the test to:	

C302.1	Determine the discharge of Venturimeter , Orifice meter, Rectangular Notch, Triangular Notch
C302.2	Determine the coefficient of velocity and the coefficient of contraction of the orifice and mouth piece.
C302.3	Knowledge of laminar flow, turbulent flow & Reynolds number
C302.4	Perform experiments to know and verify basic terminology related to fluid mechanics.
C302.5	Perform experiment to find out various hydraulic parameters for an open channel flow.
C302.6	Perform experiment on different turbines and pumps to understand its working and operational terms related to them.
BTCVE303T SOLID MECHANICS	
After studying this subject, the students will be able to	
C303.1	Understand the behaviour of materials under different stress and strain conditions.
C303.2	Evaluate and draw shear force diagram and bending moment diagram and their relation.
C303.3	Formulate the bending and shear stresses equations and able to draw bending and shear stress diagrams.
C303.4	Formulate slope and Deflection equations for beams subjected to various loads by Macauleys method
C303.5	Analyze and Evaluate the torsion in circular section, Direct and Bending Stresses
BECVE302P Solid Mechanics (Practical)	
After the conduction of practical's will be able to perform the test to:	
C302.1	Understand the concept and application of various types of strain gauges.
C302.2	Perform various tests and evaluate different engineering properties of engineering materials by performing different test on it.
C302.3	Obtain a graphical solution to SFD & BMD problems for simple beams.
BTCVE304P Geotechnical Engineering	
After studying the subject, the students will be able to	
C304.1	Find the index and engineering properties of the soil.
C304.2	Determine properties & demonstrate interaction between water and soil.
C304.3	Analyze and compute principles of compaction and consolidation settlements of soil.
C304.4	Ability to analyze to calculate bearing capacity, earth pressure and foundation settlement.
C304.5	Study and identify different type's natural materials like rocks & minerals and soil.
BTCVE304P Geotechnical Engineering -I (Practical)	
After the conduction of practicals will be able to perform the test to:	
C304.1	Identify and classify soil based on engineering properties of soil.
C304.2	Understand and determine the density and shear strength parameters of soil of a soil using various tests
C304.3	Understand the use of different charts for classifying soil or knowing the stress under the soil.
BTCVE305T Building Construction and Elementary Building Drawing	
After studying the subject, the students will be able to	
C305.1	Identify components of a building.
C305.2	Differentiate and identify types of building materials.
C305.3	Select appropriate material for building construction.
C305.4	Plan various construction related activities and their quality control.
C305.5	Know & identify the latest techniques and materials used.
BECVE604P Building Design and Drawing (Practical)	
After the conduction of practicals will be able to perform the test to:	
C604.1	Understand building bye laws & building code
C604.2	Apply the principles of building planning and design.
C604.3	To draw submission/working drawing using suitable software.
C604.4	Make use of knowledge to give layout on the field as per the plan..
C604.5	Draw simple perspective drawings.
C604.6	Understand the drawings and detailing of Building services
BTCVE306T Effective Technical Communication	
After studying this subject, the students will be able to	
C306.1	Participate effectively in groups with emphasis on listening and meta cognitive thinking.
C306.2	Prepare memorandum and report.
C306.3	Deliver an effective oral presentation.
C306.4	Acquire public speaking skills handling the audience professionally.
C306.5	Analyze causes of deterioration of concrete components
BTCVE401T Concrete Technology	
After studying this subject, the students will be able to	
C401.1	Think logically for development Concrete technology application in field of Civil Engineering
C401.2	Gain an experience in the implementation of Concrete Materials on Engineering concepts which are applied on Construction Fields
C401.3	Understand the process of mix design of concrete.
C401.4	Differentiate special concrete from conventional concrete.
C401.5	Analyze causes of deterioration of concrete components
BTCVE402T Structural Analysis	

After studying this subject, the students will be able to	
C402.1	Apply knowledge to analyse determinate and indeterminate structures.
C402.2	Apply knowledge to perform analysis of beams and frames using Slope Deflection Method and Moment Distribution Method.
C402.3	Apply knowledge of Influence Line Diagram to analyse structural members for rolling loads.
C402.4	Apply knowledge of Direct Stiffness Method to analyse Beams and Plane Frames.
C402.5	Apply knowledge of Direct Stiffness Method to formulate Stiffness Matrix, Transformation Matrix, Load Matrix to analyse Plane Truss.
BECVE 402P Structural Analysis – I (Practical)	
After the conduction of practical will be able to perform the test to:	
C402.1	Apply the knowledge of different methods of analysis of structures to analyze the structural elements.
C402.2	Use the understanding obtained in theorems & principles of analysis of structure and verifies the same experimentally.
C402.3	Understand the working principle and use of Strain gauges and Poloriscope in structural analysis.
C402.4	Apply practical knowledge of structural software, in analysis and design of structural components.
C402.5	Understand basics of stiffness matrix, for the evaluation of displacement, moments etc.
C402.6	Apply the knowledge into evaluation of appropriate solution to engineering problems with the help of software and modern tools.
BTCVE403T Environmental Engineering	
After studying this subject, the students will be able to	
C403.1	Have knowledge of characteristics of water, drinking water standards and necessity of treatment.
C403.2	Design various units of conventional water treatment plant.
C403.3	Understand the characteristics of waste water, necessity of treatment, types of treatment processes
C403.4	Equip with the basic knowledge related to design of waste water treatment
C403.5	Understand of significance of air pollution, solid waste, climate change, geoenvironment etc
BTCVE403P Environmental Engineering – I (Practical)	
After the conduction of practical's will be able to perform the test to:	
C403.1	Perform different tests to ascertain physical, chemical and biological characteristic of given water sample.
C403.2	Understand the importance of levels of BOD & COD in a waste water treatment and know various methods to determine the same.
C403.3	Understand and visualize the working of various units of Water Treatment Plant during the visit and can write a report.
BTCVE404T Transportation Engineering	
After studying this subject, the students will be able to	
C404.1	Define and describe different objectives and requirements of Highway Development and Planning, Alignments.
C404.2	Explain, Discriminate and Design various Geometric Features of Highways & Pavement Design
C404.3	Understand, analyze, apply and evaluate the parameters of Traffic Engineering.
C404.4	Explain and describe various terms in railway engineering and should be able to explain, discriminate and design various geometric features of railway track.
C404.5	Understand the aircraft characteristics and terminal area functions, analyze, and evaluate the basic runway length, orientation of runway.
BTCVE404P Transportation Engineering (Practical)	
After studying the subject, the students will be able to	
C404.1	Understand the classification and strength parameters of sub-grade soil through various tests.
C404.2	Acquire the knowledge about different physical and engineering properties of aggregates by performing different test on road aggregates.
C404.3	Understand the various properties of bitumen material by performing various tests on it.
BTCVE405T Surveying & Geomatics	
After studying this subject, the students will be able to	
C405.1	Measure length and bearing of lines using various instruments and calculate area of given field.
C405.2	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.
C405.3	To carry out levelling and contouring also able to determine volume of earthwork.
C405.4	Use modern instrument like Total work station, GPS, DGPS for surveying and able to prepare maps in CAD
C405.5	Use Remote Sensing and Geographical Information System(GIS), UAV Drone and LiDAR Survey.
BTCVE405P Surveying – I (Practical)	
After studying the subject, the students will be able to	
C405.1	Exhibit the knowledge of working and uses of various survey instruments.
C405.2	Take the measurement, record the measurement and perform the calculations by applying necessary adjustments.
C405.3	Collect the surveyed data and to compute the area traverse using various instruments.
C405.4	Learn the importance of errors and precisions during the survey work.
C405.5	Handle & record measurement on instruments used in various types of surveying.
C405.6	Carry out detailed survey of an area using appropriate technique and draw topological features on the sheet.
FIFTH & SIXTH SEMESTER B. TECH.	
BTCVE501T Hydraulics Engineering	
After studying this subject, the students will be able to	
C501.1	To know the boundary layer theory and concept of drag and lift
C501.2	To understand the various losses occurring in pipe flow, various phenomenon occurring in this case
C501.3	To compute uniform flow through open channel and understand the concept of specific energy
C501.4	To analyse the gradual varied flow and hydraulic jump concept
C501.5	To understand the design principle of various hydraulic machines likes turbines and pumps
BTCVE501P Hydraulics Engineering (Practical)	

After the conduction of practicals will be able to perform the test to:	
C501.1	Perform experiments to know and verify basic terminology related to fluid mechanics.
C501.2	Perform experiment to find out various hydraulic parameters for an open channel flow.
C501.3	Perform experiment on different turbines and pumps to understand its working and operational terms related to them.
BTCVE502T Reinforced Cement Concrete Designs	
After studying this subject, the students will be able to	
C502.1	Understand the fundamental concepts of working stress method as per IS 456- 2000 and Pre-stressed concrete method.
C502.2	Apply the fundamental concepts of limit state method on limit state of serviceability
C502.3	Analyze the fundamental concepts of limit state of collapse in flexure, Shear & Bond as per IS 456-2000.
C502.4	Evaluate the fundamental concepts of limit state of collapse in compression and design of footing as per IS 456-2000.
C502.5	Design of Simply supported Two-way slab
BTCVE 503T Civil Engineering Materials, Testing and Evaluation	
After studying this subject, the students will be able to	
C503.1	Evaluate the role of materials in Civil Engineering
C503.2	Know the mechanical behaviour and properties of steel and concrete by standard testing procedures for identifying their performance
C503.3	Explain special materials, composite materials and use of new techniques in constructions for satisfying the future needs of industry.
C503.4	Exposure to a variety of established material testing procedures/techniques and the relevant codes of practice
C503.5	Evaluate and write a technical laboratory report.
BTCVE 503P Civil Engineering Materials, Testing and Evaluation(Practical)	
After the conduction of practical will be able to perform the test to:	
C503.1	Perform different tests on cement, coarse and fine aggregate to ascertain the properties useful in production of good concrete and do the actual mix design of concrete
C503.2	Perform the tests on hardened concrete to understand and know its compressive strength variation.
C503.3	Ascertain the quality of concrete by performing non-destructive testing of the existing concrete.
BTCVE504T Professional Practice, Law & Ethics	
After studying this subject, the students will be able to	
C504.1	Understand basic purpose of profession, professional ethics and various moral and social issues.
C504.2	Analyse various moral issues and theories of moral development
C504.3	Realize their roles of applying ethical principles at various professional levels
C504.4	Identify their responsibilities for safety and risk benefit analysis.
C504.5	understand their constructive roles in dealing various global issues
BECVE505T Elective – I(Advanced Structural Analysis)	
After studying the subject, the students will be able to	
C505.1	Compute deflections in two dimensional structures using Strain energy method
C505.2	Understand response of long columns
C505.3	Use the approximate method for analysis of multi-storied frame structures
C505.4	Understand Flexibility matrix method and application of column analogy
C505.5	Understand the concepts related to structural dynamics & finite element method
BECVE506P Advanced Concrete Structure (Elective-II)	
After studying this subject, the students will be able to	
C506.1	Understand the behaviour and failure modes of different RC structural members
C506.2	Analyze and apply the results in designing various RC structural members.
C506.3	Apply the knowledge and skills in practical problems
C506.4	Understand the relevant software and use the same in the analysis and design of RC members.
BTCVE507P Industrial Training & Professional Skill Training	
After studying the subject, the students will be able to	
C507.1	Understand organizational skills & professional practices
C507.2	Interpret the communication skills of organizational members with each other
C507.3	Analyze the structural problems by using STADD.PRO
C507.4	Design the structural members by using STADD.PRO
BTCVE508AU Organizational Behaviour	
After studying the subject, the students will be able to	
C508.1	Understand the concept and importance of organizational behaviour.
C508.2	Acquire the knowledge of interpersonal behaviour and transaction analysis
C508.3	Know different traits and theories of personality
C508.4	Analyze the importance of motivation in organization and types of leadership
BTCVE601T Estimating and Costing	
After studying this subject, the students will be able to	
C601.1	Prepare the preliminary estimate for administrative approval & technical sanction for a civil engineering project.
C601.2	Write the specification of the works to be undertaken, prepare the tender documents, fill the contracts and make use of knowledge of different contract
C601.3	Use the concept of SD, EMD, MAS, Running Bill, Final Bill during the entire project
C601.4	Use the technique of Rate analysis in estimating the exact cost of material & manpower and hence the entire project.

C601.5	Estimate the bill of quantities using different techniques of preliminary & detailed estimation of buildings & roads & Arrive the exact value of the asset
BTCVE601P Estimating and Costing (Practical)	
After the conduction of practicals will be able to perform the test to:	
C601.1	Prepare preliminary estimates and detailed estimate of the each item of the project using appropriate method and perform the rate analysis of materials and manpower to obtain exact cost of the project.
C601.2	Use the knowledge in drafting the Specification, tender notice, contract proposal, etc and prepare the bill of quantities for the project.
C601.3	Understand the term depreciation and methods of calculating it and make use of it in valuation of the building or commodity.
BTCVE602T Construction Engineering and Management	
After the conduction of practicals will be able to perform the test to:	
C602.1	Get themselves acquainted with various economic and managerial aspects of construction industry
C602.2	Understand the tools and techniques of economic analysis for improving their decision making skills
C602.3	Analyze the structure of market and effects of inflation with special reference to construction industry.
C602.4	Understand the importance of marketing management and its effect on construction industry.
C602.5	Acquire financial acumen for construction business.
BTCVE603T Water Resource Engineering	
After studying this subject, the students will be able to	
C603.1	Understand occurrence, movement and distribution of water and estimate water abstractions, runoff and hydrographs
C603.2	Illustrate different systems and methods of irrigation and estimate the quantity of water required by crops and estimate the quantity of water required by crops
C603.3	Estimate reservoir capacity and analyse and design earth dams
C603.4	Design and analyse gravity dams and illustrate types of Spillways and energy dissipators
C603.5	Design unlined and lined channels and illustrate concepts of other irrigation structures
BTCVE604T Prestressed Concrete (Elective-III)	
After studying this subject, the students will be able to	
C604.1	Understand the behaviour of pre-stressed concrete.
C604.2	Design of the pre-stressed concrete structures.
C604.3	Understand the knowledge of basic theories and fundamental behaviour of prestress concrete.
C604.4	Perform the analysis and design of pre-stress elements
C604.5	Apply the fundamental knowledge to the solution of practical problems.
Seventh & Eight Semester B.E.	
BECVE701T Advanced Concrete Structures	
After studying this subject, the students will be able to	
C701.1	Understand the behavior and failure modes different concrete members
C701.2	Analyze and apply the results in designing various concrete member of structure.
C701.3	Apply the knowledge & skills in practical problems
C701.4	Understand the relevant software and use the same in analysis & design of concrete members.
BECVE701P Advanced Concrete Structures (Practical)	
After the conduction of practicals will be able to perform the test to:	
C701.1	Analyze and design various concrete member of structure.
C701.2	Understand the relevant software and use the same in analysis & design of concrete members.
C701.3	Can write a report of visit to a site of concrete construction
BECVE702T Estimating and Costing	
After studying this subject, the students will be able to	
C702.1	Prepare the preliminary estimate for administrative approval & technical sanction for a civil engineering project.
C702.2	Understand and write the specification of the works to be undertaken, prepare the tender & contract documents and make use of knowledge of different contract submission & opening in awarding the work to the contractor.
C702.3	Use & execute the concept of SD, EMD, MAS, Running Bill, Final Bill during the entire project
C702.4	Prepare the bar bending schedule & also be able to find the quantity of steel
C702.5	Use the technique of Rate analysis in estimating the exact cost of material & manpower and hence the entire project.& finding the rate per unit.
C702.6	Prepare the estimate the bill of quantities using different techniques of preliminary & detailed estimation of buildings & roads
BECVE702P Estimating and Costing (Practical)	
After the conduction of practicals will be able to perform the test to:	
C702.1	Prepare preliminary estimates and detailed estimate of the each item of the project using appropriate method and perform the rate analysis of materials and manpower to obtain exact cost of the project.
C702.2	Use the knowledge in drafting the Specification, tender notice, contract proposal, etc and prepare the bill of quantities for the project.
C702.3	Understand the term depreciation and methods of calculating it and make use of it in valuation of the building or commodity.
BECVE703T ADVANCED TRAFFIC ENGINEERING (ELECTIVE-I)	
After studying this subject, the students will be able to	
C703.1	Use the knowledge to carry out traffic studies and give solutions to planning of transportation system.
C703.2	Apply basic principles for the geometric design of roads and other traffic controlling devices

C703.3	To understand the parking systems, riding quality standards, traffic safety and accident study and suggest the solutions to the practical problems.
BECVE704T Construction Management & Law	
After studying this subject, the students will be able to	
C704.1	Demonstrate the understanding of various types of projects, modern construction techniques and will exhibit the mastery in construction planning, scheduling and various controls.
C704.2	Achieve the knowledge of various types' of equipments to be used in the construction and its operational cost estimates, understand manpower requirement, planning, resources utilization and management.
C704.3	To know the quality control aspects in planning & management, modern trends project management, application of information system in management of construction projects, safety provisions and equipments.
C704.4	Analyze the legal aspects in construction projects through the understanding of various laws pertaining to civil engineering and architectural planning & sanctioning, labor & organizational welfare measure, provisions of arbitration and litigations.
BECVE705T Transportation Engineering - II	
After studying this subject, the students will be able to	
C705.1	Understand the functions of various elements of railways, airports, tunnels and docks and harbor.
C705.2	Plan and design various elements of railways, airports, tunnels and docks and harbor.
C705.3	Understand the various principles traffic control in railways, airports, tunnels and docks and harbor.
C705.4	Understand layout, design and construction permanent way, runway, taxiways, tunnels, births and jetty.
C705.5	Understand layout, design and construction permanent way, runway, taxiways, tunnels, births and jetty.
BECVE801T Irrigation Engineering	
After studying this subject, the students will be able to	
C801.1	Understand the importance and scope of irrigation engineering
C801.2	Understand the methods and efficiencies of irrigation, crop water requirement.
C801.3	Acquire the knowledge in planning, design and operation of storage reservoir and make use of it in the practical situation.
C801.4	Understand the basic profile of dams and use the knowledge in checking stability of Gravity dams and Earth dams.
C801.5	Understand the theories of Canal design and apply the concept to design lined and unlined canals and detail out the cross sections.
C801.6	Understand water logging and provide the solution to such problem.
BECVE802T Pavement Analysis And Design (Elective-II)	
After studying this subject, the students will be able to	
C802.1	Analyze and Design pavement and under different loading conditions for highways and airfields taking into consideration different characteristics.
C802.2	Propose a pavement management system framework
C802.3	Design highway appurtenance and highway drainage.
C802.4	Perform different tests considering field conditions and using the knowledge to increase the strength of pavements along with its economy point of view.
BECVE803T Water And Waste Water Treatment (Elective - III)	
After studying this subject, the students will be able to	
C803.1	Understand the composition of typical municipal solid wastes, their sources, collection, treatment and disposal.
C803.2	Attain the ability to use the techniques, skills, and modern engineering tools necessary for environmental engineering practices.
C803.3	Understand the stages and process of waste water treatment
C803.4	Understand the use and working of various units of water treatment plant.
C803.5	Make use of the knowledge related to WTP in the design of different units of water & waste water treatment plant.
C803.6	Acquire the knowledge of recent development in water & waste water treatment .
BECVE803P Water And Waste Water Treatment (Elective - III) (Practical)	
After the conduction of practical's will be able to perform the test to:	
C803.1	Know various water and waste water parameter.
C803.2	Perform various tests on different samples of water and waste water to ascertain the presence of impurities so as to evaluate the quality of water.
C803.3	Make use of the knowledge to Design individual units of a WTP.
BECVE804T Construction Economics and Finances	
After studying this subject, the students will be able to	
C804.1	Acquaint with various economic and financial aspects of construction industry
C804.2	Understand the tools and techniques of economic analysis for improving their decision making skills
C804.3	Understand the knowledge of economics and finance with special reference to construction industry
C804.4	Understand the concept of IRR, turnkey construction projects
C804.5	Apply knowledge of inflation, recession, financial ratios

Department of Mechanical Engineering

The department of Mechanical Engineering has framed the following Program Outcomes in consultation with concerned

PROGRAM OUTCOMES(POs)	
PO1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	Problem analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3	Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4	Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO6	The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO7	Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
COURSE OUTCOMES(COs)	
Manufacturing Processes BEME302T	
CO2.1	Understand the importance of manufacturing processes, techniques of pattern making and moulding with their properties. Design gating system along with selection of different types of melting furnaces and special casting process.
CO2.2	Get acquainted with the basic concept of joining process, welding process and its types, defects and application.
CO2.3	Get acquainted with the forming process for metal, mechanics of forming process along with different types of rolling machine.
CO2.4	Understand and define press working process along with its classification, types and terminology, different types of dies and introduction to shaping operation
CO2.5	Understand introduction to plastics, ceramics and glasses, its properties, application, forming and its shaping.
Thermodynamics Engineering BEME303T	
CO3.1	Explain thermodynamics concepts, relate laws of the ideal gas, identify various thermodynamic processes and apply the laws to determine the energy transfer in terms of heat and work.
CO3.2	Explain the first law of thermodynamics and apply the law to evaluate open, closed systems, thermal components and devices.
CO3.3	Interpret the second law of thermodynamics, entropy, and apply the law to evaluate heat engine, heat pump, and refrigerator performance.
CO3.4	Relate various steam properties, and analyze the different types of processes using steam as working fluid to determine the energy transfer in terms of heat and work.
CO3.5	Compare various power cycles and analyze the cycles to determine the energy transfer in terms of heat, work and efficiency.
Kinematics of Machines BEME304T	
CO4.1	Perform kinematic and dynamic analysis (Displacement, Velocity, acceleration, Inertia forces) of a given mechanism using analytical and graphical method.
CO4.2	Understand the concept of compliant mechanisms.
CO4.3	Contrive or synthesize new mechanisms for specific requirements and Perform computer aided analysis of simple mechanisms.
CO4.4	Construct cam profiles and analyse the follower motion.
CO4.5	Understand Geometry of gear, its types, analysis of forces and motions of gear teeth. Study of gear trains and governors
Machine Drawing and Solid Modeling BEME305P	
CO5.1	Interpret and describe basic elements of standard machine drawing like lines, dimensions, tolerances,symbols etc.
CO5.2	Create 2-D detailing, sectional views of machine elements from given isometric view.
CO5.3	Understand and apply concepts of GD&T for creating part and assembly drawing.
Computer Application/Programming(BEME306P)	
CO6.1	Understand and explore concepts in basic programming like data types, input/output functions, operators, programming constructs and user defined functions.
CO6.2	Develop capabilities of writing „C“ programs in optimized, robust and reusable code
CO6.3	Apply appropriate concepts of data structures like arrays, structures implement programs for various applications
Machining Processes (BEME401T)	
CO1.1	Understand fundamentals of metal cutting
CO1.2	Understand basic construction and operations of lathe shaping, planning
CO1.3	Understand basics of milling and milling cutters. slotting
CO1.4	To know about the surface finishing processes
CO1.5	Understand the basic of drilling, boring, reaming and broaching.
Fluid Mechanics & Hydraulic Machines (BEME402T)	
CO2.1	Classify and explain fluid their properties, fluid in rest condition, types of flow & flow measuring devices and mathematical application of equations on hydraulic components
CO2.2	Explain behavior of fluid in motion condition and application of Bernoullie's equation to fluid flow measuring devices.
CO2.3	Apply dimensional analysis to design hydraulic machines and different losses of fluid flow through pipes.
CO2.4	(i) classify different layout of hydro-electric power plant and (ii) analyze design characteristics of hydraulic machines i.e. turbines (impulse and reaction), Pelton turbine , Francis turbine, propeller turbine and Kaplan turbine
CO2.5	Explain the working principle & design of Centrifugal and reciprocating pump & practical application of similitude & model testing.
Material Science & Engineering (BEME403T)	
CO3.1	Student will be capable to distinguish microstructure and analyze the effect of Crystalline nature of metals, construct and analyze Iron-Iron carbide equilibrium diagram.

CO3.2	Student will be able to study the commercial steels
CO3.3	Student will be able to analyze and implement suitable heat treatment processes
CO3.4	Student will be able to analyze the Cast Iron
CO3.5	Student will be able to perceive the basics of powder Metallurgy for powder metallurgical components.
Mechanics of Material (BEME404T)	
CO4.1	Demonstrate fundamental knowledge about various types of loading and stresses induced
CO4.2	Draw the SFD and BMD for different types of loads and support conditions
CO4.3	Estimate the strain energy in mechanical elements. And analyse the deflection in beams.
CO4.4	Can design shaft for various loading conditions
CO4.5	Understand theory of failure and effective designing of column and struct.
Professional Ethics Syllabus (BEME405T)	
CO5.1	Understand basic purpose of profession, professional ethics and various moral and social issues
CO5.2	Analyze various moral issues and theories of moral development
CO5.3	Realize their roles of applying ethical principles at various professional levels
CO5.4	Identify their responsibilities for safety and risk benefit analysis.
CO5.5	Understand their roles in dealing various global issues
Heat Transfer-BEME501T	
CO1.1	Students will be able to define and compare the different modes of heat transfer and calculation of thermal resistance and heat transfer through plane and composite wall, cylinder and sphere with and without thermal contact resistances.
CO1.2	Students will be able to apply the concept of internal heat generation for the calculation of heat transfer for plane wall, cylinder and sphere and also learn about various types of fins and their significance in steady state conduction heat transfer calculations. It will also help them to understand the concept of unsteady state heat transfer.
CO1.3	Students will be able to select and apply appropriate empirical correlations to estimate forced convection and free convection heat transfer, for internal and external flows.
CO1.4	Students will be able to evaluate heat transfer rate by radiation from ideal and actual surfaces and enclosures of different geometries
CO1.5	Students will be able to evaluate heat exchanger performance for the given geometry and boundary conditions and design suitable heat exchanger geometry to deliver a desired heat transfer rate.
Energy Conversion -I -BEME502T	
CO2.1	Explain, classify, analyze layout of power plant, cogeneration principle of steam generators (i.e. Boilers), boiler mountings & accessories and evaluate performance parameters of boiler.
CO2.2	Explain the concepts of fluidized bed boilers and various draught system and evaluate performance parameters of natural draught system(i.e. chimney)
CO2.3	Explain the importance of steam nozzle and determine its throat area, exit area, exit velocity. Also compare impulse and reaction steam turbines and explain the concept of governing of steam turbine
CO2.4	Explain the methods of compounding of steam turbine, various energy losses in steam turbine and able to draw velocity diagrams of steam turbine blades to analyze the angles of the blades, work done, thrust, power, efficiencies of turbine
CO2.5	Explain, classify steam condensers, cooling towers and evaluate performance parameters of surface condenser.
Design of Machine Elements –(BEME503T)	
CO3.1	Apply principals of static loading for design of Cotter joint, Knuckle joint
CO3.2	Design bolted, welded joints, power screws & pressure vessels
CO3.3	Design the power transmission shaft & coupling
CO3.4	Design components subjected to fatigue or fluctuating stresses. Also, will be able to apply principles for determining bending stresses for desing of curved beams e.g. crane hook, C-Frame.
CO3.5	Design clutches, brakes and springs
Industrial Economics & Management-BEME504T	
CO4.1	Understand the concept of demand and supply and its relationship with the price
CO4.2	Relate various factors of production with reference to different economic sectors
CO4.3	Analyze the causes and effects of inflation and understand the market structure
CO4.4	Acquire knowledge of various functions of management and marketing management
CO4.5	Perceive the concept of financial management for the growth of business
Automobile Engineering -I -BEME505T	
CO5.1	Demonstrate the vehicle construction, chassis, fuel supply system, lubrication system and cooling system in automobile.
CO5.2	Illustrate the principle and working of Transmission system and clutch, gear box, rear axle drives, fluid flywheel, torque converter.
CO5.3	Identify the steering, suspension system and brake system.
CO5.4	Understand the applications of electrical/electronic system of automobile and wheels, tyres.
CO5.5	Explain the concept of electric vehicles, Hybrid vehicles, fuel cell vehicles and vehicle pollution norms. Appraise the automobile safety system and recent development in automobiles.
Automation In Production (BEME601T)	
CO1.1	Get Acquainted With Automation, Its Type's ,Strategies , Assembly Line Balancing And Its Analysis, Methods Of Work Part Transport
CO1.2	Recognize fundamentals and constructional features of N.C, CNC and D.N.C machines and prepare a CNC program for given part.
CO1.3	Get Acquainted With The Robotic Configuration, Types Of Links, Joints, Grippers, Industrial Robotics And Robot Applications.
CO1.4	Cultivate Information About Automated Material Handling Systems, Automated Storage And Retrieval System (AGVS,AS/RS) Its Analysis
CO1.5	Get Acquainted With Automated Inspection (CAPP, CAQC, CMM) And Group Technology.
CO1.6	Recognize CAD/CAM,CIM,FMS, Understand The Concepts Of Shop Floor Control
Energy Conversion-II (BEME602T)	
CO2.1	Classify various types of I.C. Engines and explain the working of its various components and systems.
CO2.2	Analyze the effect of various operating variables on engine performance
CO2.3	Understand the working of Gas Turbine and Jet propulsion system
CO2.4	Analyze the vapour compression refrigeration system and psychometric process.
CO2.5	Understand the working of various types of compressors

Dynamics of Machines –(BEME603T)	
CO3.1	Comprehend the machine dynamics through basic principles to interpret their application and examine near to life problems due gyroscopic effects and determine the conditions for stability of ships, airplanes and automobile.
CO3.2	Analyze dynamic force conditions in planer linkages and cams to determine required driving torque condition (graphically/ analytically).
CO3.3	Estimate the unbalanced forces due to rotating and reciprocating masses in a mechanical system and calculate (graphically/ analytically) the balancing masses required for safe/ smooth operation of these mechanical systems.
CO3.4	Identify the requirement of flywheel, brakes, and dynamometers in a mechanical system and calculate inertia of flywheel and braking condition to be incorporated in engines and machines.
CO3.5	Recognize and interpret the concept of vibration in various mechanical systems and distinguish vibration characteristics for 1 & 2 DOF systems to evaluate the conditions for its control/ use.
Operation Research(BEME604T)	
CO4.1	Recognize the importance and value of Operations Research and mathematical modeling in solving practical problems in industry
CO4.2	convert given situation to mathematical form and determine optimal settings.
CO4.3	understand Operations Research models and apply them to real-life problems;
CO4.4	manage projects for minimum total cost and smooth level of resources.
CO4.5	make decisions related to age of replacement of equipment
CO4.6	develop simulation of real life system to analyze and optimize system concerned.
Advanced I C Engines –(BEME605T)	
CO5.1	Understand basics of IC Engine, types of IC Engine, working cycle, cooling and lubrication system
CO5.2	Understand basic fuel, Alternate fuels and fuel supply system in IC engine
CO5.3	Understand combustion phenomenon in in SI and CI engine.
CO5.4	Understand the various performance parameters of an engine, testing procedure and its analysis.
CO5.5	Illustrate emission norms its emission control for engine. Comprehend the different technological advances in engines.
Industrial Engineering (BE ME 701T)	
CO1.1	Productivity, its importance and tools & techniques for improvements of productivity, concep and practical application of method study, motion study.
CO1.2	Work measurement techniques, various tools for work measurement work sampling, Estimation of time required for completion of any activity or job. Involvement of Human in Engineering, Man machine concept, design of environment, system, work place etc.
CO1.3	Forecasting and its various methods.
CO1.4	Maintenance, their types, Reliability, maintainability, failure data analysis.
CO1.5	Quality control, various tools for quality control, Characteristics, sampling concepts, its significance and various sampling plans.
CO1.6	Statistical Quality Control, Quality Planning, assurance, audit and Philosophy of quality improvements.
Automobile Engineering (BEME702T3)	
CO2.1	Basic concept of layout of chassis and its main component, frame, rigid vehicle. Various type of engine used in automobile their fuel supply system cooling 7 lubricating system.
CO2.2	Necessity requirement & type of clutches system & transmission
CO2.3	Various types of transmission system & components. Necessity and type, working of breaks.
CO2.4	Principle of steering & various terminology used in steering system, working & function of suspension system
CO2.5	Working & various methods of testing & charging of electrical system and ignition system. Various concept used in wheels &tyres.
CO2.6	Safety consideration, modern development in automobile
Computer Aided Design (BE ME 703T)	
CO3.1	Basic concept of CAD, Comparison between CAD and conventional design, generation of algorithms for basic geometric entities.
CO3.2	Introduction to windowing & clipping, 2D transportation, 3D transportation.
CO3.3	Techniques for geometric modeling and assembly modeling.
CO3.4	Finite element analysis, one dimensional problem, Finite element modeling, Potential energy approach.
CO3.5	Truss and Two dimensional FEM, Derivation of shape functions for CST element, Pre processing and Post processing.
CO3.6	Optimization in Design, objectives of optimum design, Johnson's method of optimum design, Optimum design with normal and redundant specifications of simple machine elements.
BEME704T and BEME704P ENERGY CONVERSION - II (Theory)	
CO4.1	Construction, operation and analysis of Positive displacement type of air compressors.
CO4.2	Construction, operation and analysis of Blowers, Centrifugal and Axial flow compressor
CO4.3	Introduction, classification , working, Combustion and Fuel injection systems.
CO4.4	Testing and Performance of I. C. Engines with measuring instruments.
CO4.5	Detail analysis of conventional single stage vapour compression refrigeration system and Introduction to Vapor absorption and air refrigeration system.
CO4.6	Introduction and analysis simple Air conditioning system.
DESIGN OF MECHANICAL DRIVES (BE ME 705 T)	
CO5.1	At the end of this course students will be able to understands, Design of Coupling, Design of Flywheel: Functions, design of flywheel. Design of Bearings:
CO5.2	Design of Flat belt drive, analysis of belt tension, condition for transmitting maximum power, Design of V belt drive: Design of Roller chain drive, Design of wire rope drive:
CO5.3	Design of Gears, Design of Spur Gear drive, Helical Gear drive. Design of Bevel Gear Drive
CO5.4	Design of Worm Gear Drive, Design of I. C. Engine components, Introduction to selection of material for I. C. engine components
Industrial Management (BE ME 801T)	
CO1.1	Various principles, concepts of management, Principles of Henry Fayol& its functions.
CO1.2	Meaning, functions of personal management, worker's welfare.
CO1.3	Meaning & concepts of marketing management, new product development.
CO1.4	Financial management, sources of finance & various concepts related to budget.
CO1.5	Meaning, principles & selection of plant location, plant layout, Industrial safety, types of production.
CO1.6	Recent trends in production & operation management, Reverse Engineering.
ELECTIVE-II BE ME 802 T (5) REFRIGERATION AND AIRCONDITIONING (Theory)	

CO(5).1	Introduction to basics of various refrigeration cycles and its nomenclature.
CO(5).2	Compound Vapour Compression Refrigeration system and multiple evaporator system.
CO(5).3	Air cycle refrigeration & its application.
CO(5).4	.Basics and application of the Cryogenics.
CO(5).5	Study of various Advanced Psychometric processes & its Heat Load Calculations
ENERGY CONVERSION - III (BE ME 805T)	
CO5.1	Principles and working, and analysis of Gas Turbine.
CO5.2	Principles & working of turbojet, turbo-prop, Ramjet & pulse jet and its analysis. Introduction and working of Nuclear Power Plant.
CO5.3	To study the principle and working of various solar energy equipments.
CO5.4	To study Energy Auditing.
CO5.5	Study of various Hydraulic systems.
CO5.6	Study of various Pneumatic Systems.
AUTOMATION IN PRODUCTION (BE ME 804T)	
CO4.1	Definition, types, reasons, strategies for automating, arguments for and against
CO4.2	automation along with partial automation and manual assembly lines.
CO4.3	Basic concepts, coordinate system and machine motion, Types of NC system, part programming and tape formats, APT programming and Adaptive control.
CO4.4	Introduction, to robot anatomy, end effectors, sensors, robot programming and applications.
CO4.5	Automated Guided Vehicle Systems and their Types, AGVS. Vehicle guidance & routing, Traffic control & AS/RS.
CO4.6	Automated inspections, Machine vision image acquisition & digitization, image processing &

Department of Applied Science And Humanities	
PROGRAM OUTCOMES(POs)	
PO1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	Problem analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4	Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO6	The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO7	Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Course outcomes of Department of Applied Science And Humanities

B. Tech. FIRST SEMESTER

BSE1-1T Mathematics - I	
CO101.1	Students will be able to apply the concept of successive differentiation in the analysis of expansion of function in series form, indeterminate forms and
CO101.2	Students will be able to understand the significance of derivatives of functions of several variables and use it to find series approximation to the function of
CO101.3	Students can apply the concepts of matrices for analysis of system of linear equations, rank of matrix, finding linear, orthogonal transformations Cayley
CO101.4	Students gain the knowledge of solving first order first degree and higher degree equations, linear reducible to linear and exact differential equations. This
CO101.5	Students achieve the knowledge to solve higher order differential equations with constant coefficients, simultaneous differential equations, special type of
BSE1-2T Applied Physics	
CO102.1	Student will be able to learn the concept in interference and diffraction to solve relevant numerical problems and to relate to relevant engineering
CO102.2	Student will be able to learn the basic concepts of dual nature of matter and wave packet and apply them to analyze various relevant phenomena and to
CO102.3	Student will be able to 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.
CO102.4	Student will be able to understand the basic idea of total internal reflection to the propagation of light in an optical fiber and make use of the fiber concepts
CO102.5	Student will be able to find how to extend the basic concepts of motion of charged particles in electric magnetic fields to solve numericals problems and to
BSE1-2P	
Applied physics aims at using physics to solve scientific or engineering problems, thereby bridging the gap between physical science and technology.	
BSE1-3T Energy and Environment	
CO103.1	At the end of the course the students will be able to obtain the knowledge of solid and gaseous fuel and their calorific value determination. Sources and

CO103.2	At the end of the course the students will be able to recognize the type of liquid fuels and their uses in IC engines. Combustion calculations.
CO103.3	At the end of the course the students will be able to apply the knowledge about the use of alternative sources of energy and utilize solid waste as energy
CO103.4	At the end of the course the students will be able to obtain the knowledge of industrial pollution and its types, environmental impact and its control,
CO103.5	After studying the course the students will be able to develop innovative ideas for use of advanced materials in sustainable development, its properties and application. Use of nanomaterials in energy.
BSEI-3P	The practical knowledge of handling chemicals. Experimental techniques using modern instrumentation. Analysing a broad foundation in energy and environment that stresses scientific reasoning and analytical problem solving with a molecular perspective.
BSEI-4T	Communication Skill
CO104.1	It helps with a practical examples and exposures to effective techniques & situations and benefits the students.
CO104.2	Encourages to learn behavioural transformation in speaking & Public speaking.
CO104.3	Inculcates the concept of reading and comprehension skills.
CO104.4	To develop self confidence reading, story narration and on the spot/situation based explanation. GDPI tools and techniques are induced in students
BSEI-4P	Generate confidence, soft skills towards public speaking, group discussion and interviews. Scientific approach oriented methods to spoken english. Narration of pictures and events on extempore basis
BSEI-5T	Engineering Graphics
CO105.1	The learner will be able to understand the basic knowledge of engineering graphics such as instruments, lines, dimensioning techniques, scales, sheet layout. Construct the various engineering curves using the drawing instruments and basic of orthographic projection through drawing the projection of point and line.
CO105.2	The learner will be able to understand projections of different types planes (2D) and solids (3D) and will be able to draw different views of plane and solids.
CO105.3	The learner will be able to understand concept of sectioning and development of lateral surfaces of solid and will be able to represent it.
CO105.4	Apply the visualization skill to draw a simple isometric projection / view from given orthographic views precisely using drawing equipment.
BSEI-5P	To know about different types of lines and uses different types of pencils in an engineering drawing. To know how to represent letters and numbers in drawing sheet.
BSEI-6T	Basic of Civil and Mechanical Engineering
CO106.1	Introduction to what constitutes civil engineering. Identifying the different areas available to pursue and specialize within the overall field of civil engineering. Highlighting the depth of engagement possible within each of these areas.
CO106.2	Exploration of the various possibilities of a career in this field. Understanding the vast interfaces this field has with the society at large. Providing inspiration for doing creative and innovative work.
CO106.3	Showcasing the many monuments, heritage structures, nationally important infrastructure and impressive projects to serve as sources of inspiration. Highlighting possibilities for taking up entrepreneurial activities in this field. Providing a foundation for the student to launch off upon an inspired academic pursuit into this branch of engineering.
CO106.4	Discuss several manufacturing processes and identify the suitable process. Explain various types of mechanism and its application.
CO106.5	Describe and compare the conversion of energy from renewable and non-renewable energy sources.
CO106.6	List down the types of road vehicles and their specifications; Illustrate various basic parts and transmission system of a road vehicle.
B.Tech. SECOND SEMESTER	
BSEII-1	Applied Mathematics – II
CO201.1	Students gain the knowledge of solving definite integral by using Gamma and Beta functions. To solve difficult definite integral a technique of
CO201.2	Students can achieve the knowledge of evaluating double and triple integrals and use it to find area between two curves, volume, mass and Centre of
CO201.3	Students can solve vector equation having triple, quadruple scalar and vector product of vectors. They can find gradient, directional derivatives, and learn
CO201.4	Students can be able to fit straight line, parabola and exponential curves to the given data using least square method. They can also learn to find lines of
CO201.5	Students can find the missing terms and value of the function in discrete data for unequal intervals, solving numerical integration and find analytical
BSEII-2T	Subject: Advanced Engineering Materials
CO202.1	The course will enable the students to learn the concept of formation of energy bands and to classify solids on its basis.
CO202.2	The course will enable the students to identify and explain different types of diodes, transistors and its applications.
CO202.3	The course will enable the students learn the concepts of magnetism and superconductivity, classify and analyze various types of magnetic and
CO202.4	The course will enable the students to learn and explain quantum transitions and apply it to working of lasers.
CO202.5	The course will enable the students to learn the concept of nano materials and compare its properties with those of bulk materials.
BSEII-2P	The objective of a materials engineer is to predict and control material properties through an understanding of atomic, molecular, crystalline and micromicroscopic structures of engineering materials. It demonstrated an ability to identify, formulate and solve complex engineering problems by applying principles of engineering, science and mathematics.
BSEII-3T	Subject: Applied Chemistry
CO203.1	The course will enable the students to rationalize the periodic properties and analyze the microscopic chemistry in terms of atomic and molecular orbitals
CO203.2	The course will enable the students to rationalize bulk properties and processes using thermodynamic processes and understand the cause of corrosion, its
CO203.3	The course will enable the students to distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in
CO203.4	The course will enable the students to apply the principles of green chemistry in designing alternative reaction methodologies to minimize hazards and
CO203.5	The course will enable the students to know about treatment of water and its applications in industry.
BSEII-3P	Measure molecular/system properties like concentrations, surface tension, conductance of solutions etc. Estimates the soluble impurities present in the given water sample. Handle the different instruments used in chemistry laboratory.
BSEII-4T	Subject : Computational Skills
CO204.1	Students will be able to learn Programming, operating system, logical problems and errors.
CO204.2	Students will be able to learn conditional branching and loops, arrays, basic algorithms.
CO204.3	Students will be able to learn functions, parameters, recursion.
CO204.4	Students will be able to learn defining and array structure, idea of pointer.
BSEII-4P	Identify, analyze, develop, implement, verify and document the requirements for a computing environment. Contribute to diagnostics, troubleshooting, documenting and monitoring of technical problems using appropriate methodologies and tools.
BSEII-5P	Workshop Practices
CO205.1	Read and interpret job drawing and plan operations.
CO205.2	Identify and select proper material, tools equipments, machines and proper operational parameters.

CO205.3	Set tools, work piece and machine for desired operations.
CO205.4	Complete job of Carpentry, fitting, welding and Smithy as per job drawing in allotted time.
CO205.5	Use safety equipment and follow safety procedures during operations.
CO205.6	Inspect the job for confirming desired dimension and shape.
BESII-6T	Subject: Basic Electrical Engineering
CO206.1	Student will be able to understand the concept of potential difference, power, Kirchhoff's laws, star Delta transformation
CO206.2	Student will be able to understand the concept of leakage flux and fringing, phenomenon of magnetic hysteresis and calculate the composite magnetic circuit.
CO206.3	Student will be able to understand the principle of generation of three phase voltage and current & power relations for balanced three phase system.
CO206.4	Student will be able to understand the concept of basic construction of transformer and OC & SC test.
BESII-8T	Subject: Indian Culture and Constitution
CO208.1	Student will become aware of Indian culture and civilization, vedic civilization and Indus valley civilization, Introduction to Vedas, Ashram system, Varna system and their role in development of society.
CO208.2	Student will understand Scope of Industrial Psychology and Industrial Sociology, Selection and Training of Workers
CO208.3	Student will be sensitized towards professional ethics, sustainable development and social change.
CO208.4	Student will understand Indian Constitution and governance of the country, social -legal awareness, right to information and public interest.
BESII-7T	Subject: Engineering Mechanics
CO207.1	Student will be able to understand effect of force on a body, position vector, two dimensional distributed loads and three-dimensional general force system
CO207.2	Student will be able to understand the effect of a system of forces on a given body with the concepts of equilibrium and free body diagram
CO207.3	Student will be able to calculate centroid/C.G and moments of inertia and solve problem of connected bodies by virtual work principle.
CO207.4	Student will be able to solve problem of connected bodies by work, energy, D'Alembert's principle and direct central impact and impulse

Department of ELECTRONICS AND TELECOMMUNICATION

PROGRAM OUTCOMES(POs)

PO1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	Problem analysis: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4	Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO6	The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO7	Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Course Outcomes (COs)

B. Tech. THIRD SEMESTER

BSE1-1T	APPLIED Mathematics
CO101.1	Students will be able to apply the concept of successive differentiation in the analysis of expansion of function in series form, indeterminate forms and
CO101.2	Students will be able to understand the significance of derivatives of functions of several variables and use it to find series approximation to the function of
CO101.3	Students can apply the concepts of matrices for analysis of system of linear equations, rank of matrix, finding linear, orthogonal transformations Cayley
CO101.4	Students gain the knowledge of solving first order first degree and higher degree equations, linear reducible to linear and exact differential equations. This
CO101.5	Students achieve the knowledge to solve higher order differential equations with constant coefficients, simultaneous differential equations, special type of
BEETC-303T	DIGITAL SYSTEM DESIGN
CO303.1	demonstrate the knowledge of: Logic gates, Boolean algebra including algebraic
CO303.2	construct basic combinational circuits and verify their functionalities
CO303.3	illustrate and apply the knowledge of different flip flops to build sequential digital circuits.
CO303.4	interpret different logic families and their characteristics.
CO303.5	demonstrate and apply programming proficiency using the various addressing modes and
BEETC-302T	COMPONENTS FOR ELECTRONIC CIRCUIT DESIGN
CO302.1	students will demonstrate the ability to : Understand the principles of semiconductor physics
CO302.2	students will demonstrate the ability to Understand the principles of semiconductor diode
CO302.3	students will demonstrate the ability to Understand and analyze the mathematical model of transistors
CO302.4	students will demonstrate the ability to Understand and analyze the mathematical model of unipolar transistors.

CO302.5	students will demonstrate the ability to Understand the process of Integrated Circuit Fabrication
BEETC-302P	COMPONENTS FOR ELECTRONIC CIRCUIT DESIGN LAB
CO302.1	The students will get the basic concepts of different semiconductor components.
CO302.2	They will be able to understand the use of semiconductor devices in different electronic circuits
CO302.3	They will be able to calculate different performance parameters of transistors. 4.
CO302.4	They will be able to plot and study the characteristics of semiconductor devices.
BEETC-303P	DIGITAL SYSTEM DESIGN
CO303.1	Demonstrate the different Boolean Laws & basics of K-map to realize combinational & sequential circuits.
CO303.2	Identify the various digital ICs & understand their operation
CO303.3	Describe the operation & timing constraints for latches, registers, different sequential circuits.
CO303.4	Solve basic binary math operations using microprocessor & explain the internal architecture & its operation within the area of manufacturing & performance
CO303.5	Select programming strategies & proper mnemonics & run their program on the training boards.
BEETC-304T	MEASUREMENTS AND INSTRUMENTATION
CO304.1	Select and use precise/accurate instrument for measurement of various electrical
CO304.2	Identify and minimize errors in electrical/electronic measurement
CO304.3	Understand analog and digital measurement.
CO304.4	Measure power and frequency with the help of function generators and different analyzers.
CO304.5	Understand modern trends in telemetry systems
BEETC-305T	SIGNALS AND SYSTEMS
CO305.1	Classify different types of signals and systems
CO305.2	Illustrate the concept of Linear Time Invariant (LTI) system and its properties
CO305.3	Analyze continuous time periodic and aperiodic signals
CO305.4	Analyze continuous time systems using Laplace Transform
CO305.5	Analyze DT signals and systems in frequency domain using Fourier Transform.
B.Tech. FOURTH SEMESTER	
BEETC-401T	MICROCONTROLLER AND APPLICATIONS
CO401.1	students will demonstrate the ability to Demonstrate the programming model of various microcontrollers.
CO401.2	students will demonstrate the ability to Design and implement 8051 microcontroller-based systems for various applications
CO401.3	students will demonstrate the ability to Illustrate & program AVR / RISC microcontrollers in Integrated Development
CO401.4	students will demonstrate the ability to Design and implement advanced processor/controllers-based systems for various
CO401.5	students will demonstrate the ability to Design and develop Arduino based embedded system applications.
BEETC-401P	MICROCONTROLLER AND APPLICATIONS LAB
CO401.1	Demonstrate the concept of Assembly languages and higher level language programming.
CO401.2	Interface various peripherals with 8051, Atmega 32, MSP 430 and Arduino.
CO401.3	Simulate the programs on different software platforms.
BEETC-402T	Subject: Programming for Problem Solving
CO402.1	Student will be able to understand the basic concepts of Object Oriented Programming
CO402.2	Student will be able to apply the knowledge of Inheritance in program development
CO402.3	
CO402.4	
CO402.3	Student will able to develop programs using polymorphism and interfaces.
CO402.4	Student will be able to handle various exceptions using concepts of exception handling.
CO402.5	Student will able to use multithreading concepts to develop inter process communication
CO402.6	Student will be able to understand and implement concepts on file streams and operations
BEETC-403P	Programming and Data Structure Lab
CO403.1	Able to choose appropriate data structure based on the specified problem definition and analysis the algorithm.
CO403.2	Able to handle operations like searching, insertion, deletion and traversing mechanism etc. on various data structures.
CO403.3	Apply the knowledge of Inheritance in program development
CO403.4	Develop programs using polymorphism and interfaces
CO403.5	Handle various exceptions using concepts of exception handling
BEETC-404T	Subject: ANALOG AND DIGITAL COMMUNICATION
CO404.1	Demonstrate a basic need of modulation and various types of amplitude and angle
CO404.2	Analyze various AM-FM receivers, along with the effect of noise on analog
CO404.3	Explain the designing of digital communication systems by applying knowledge of the
CO404.4	Describe various digital modulation techniques and various parameters associated with it.
CO404.5	Identify different types of channel coding techniques and analyze the different spread spectrum methods
BEETC-404P	Analog and Digital Electronics Lab
CO403.1	Study the practical aspects of linear and non-linear applications of OP-AMP
CO403.2	Design the various wave-shaping circuits, oscillators, signal conditioners and various application based circuits using OP-AMP and Transistors
CO403.3	Study various concepts of analog communication
CO403.4	Study various concepts of digital communication.

CO403.5	develop an application based project using industry based OPAMP
BEETC-405T	DATA STRUCTURE & ALGORITHMS
CO405.1	Student will be able to choose appropriate data structure based on the specified problem definition and analysis the algorithm.
CO405.2	Student will be able to handle operations like searching, insertion, deletion, traversing mechanism etc. on various data structures.
CO405.3	Students will be able to apply concepts learned in various domains like Operating Systems, DBMS etc
CO405.4	Students will be able to use linear and non-linear data structures like stacks, queues, linked list, trees etc.
CO405.5	Students will be able to use Advanced algorithms based on the data structures
BEETC-404T	ANALOG SYSTEM DESIGN (4TH SEM)
CO404.1	Describe differential amplifiers and operational amplifier, its operation, dc and ac analysis.
CO404.2	Design linear op-amp circuits such as voltage follower, summing amplifier, scaling and averaging amplifier, integrator, differentiator, instrumentation amplifier circuits for various practical applications.
CO404.3	Design non-linear op-amp such as comparator, Schmitt trigger and multivibrator circuits for various practical applications using IC 555
CO404.4	Analysis and design of regulated power supply such as linear regulators and SMPS.
CO404.5	Analysis and design of sinusoidal oscillators
BEETC-405T	Network Analysis
CO405.1	Apply mesh and node voltage method to model and analyze electrical circuits
CO405.2	Apply network theorems for the analysis of networks.
CO405.3	Obtain the transient and steady-state response of electrical circuits.
CO405.4	Synthesize waveforms and apply Laplace transforms to analyze networks
CO405.5	Evaluate different Network Functions and Analyze two port network behavior
B.Tech.5 th Semester	
BEETC-501T	Embedded System Design
CO501.1	To Describe and analyse the Requirements & Design issues of embedded systems design
CO501.2	To apply the knowledge of architecture and Programming of for development of simple applications.
CO501.3	To Describe and Demonstrate the interfacing of various peripherals with ARM Processor.
CO501.4	To explain the concept of Real Time Operating System for embedded system design.
BEETC-501P	Embedded System Design Lab
CO501.1	Apply the knowledge of Instruction skill for the Development of Simple and Complex Programs
CO501.2	Apply the programming skill for the Development of Simple application
CO501.3	Apply and Demonstrate the Concept of Interfacing for the Development of Embedded System
BEETC-502T	Electromagnetic Waves
CO502.1	Understand the different coordinate system & analyze theorem's of electric Field
CO502.2	Understand magnetic fields, Apply the Maxwell's equations to solve problems in electromagnetic field theory
CO502.3	Analyze the propagation of wave in different transmission media
CO502.4	Understand and analyze various parameters and characteristics of the rectangular waveguide
CO502.5	Understand principle of radiation and radiation characteristics of an antenna
BEETC-504T	INDUSTRIAL ECONOMICS AND ENTREPRENEURSHIP DEVELOPMENT.
CO504.1	Understand different types of business structure
CO504.2	Acquire the knowledge of different market structures and New economic policy
CO504.3	Grasp the functions of banks, taxations system and implications of Inflation
CO504.4	Identify various sources of finance
CO504.5	Analyse the problems of Small Scall Industries and government's policies for them
BEETC-505PE	Electronic Design Techniques with HDL(Elective-I)
	Design digital systems through HDL language
	Simulate, synthesise, and implement HDL code
	Implement code on FPGA/CPLD
BEETC-503T	DIGITAL SIGNAL PROCESSING (5TH SEM)
CO503.1	To Represent discrete-time signals analytically and visualize them in the time domain and study the basic concept of DSP.
CO503.2	To understand the z-transform for analysis of signal and system.
CO503.3	To understand the discrete Fourier transform (DFT) for analysis of signals and system.
CO503.4	To study designing of digital filters and its realization.
CO503.5	To Design and implement digital FIR filter for various applications.
BEETC-503P	Digital Signal Processing Lab
CO503.1	Demonstrate the sampling and reconstruction of discrete time signal & perform different signal operation in developing discrete time system.
CO503.2	Analyze different properties of Z-transform.
CO503.3	Analyze different properties of discrete Time Fourier transform. 4.
CO503.4	Analyze and process the signals in the discrete domain. 5.
CO503.5	Design the filters to suit requirements of specific applications.
B.Tech. 6th Semester	
BEETC-601T	Computer Communication Networks
CO506.1	Describe the basics of Computer Network, Data Communication, Network topologies, transmission media and switching techniques
CO506.2	Apply the concept of IP Addressing techniques and its various protocols of Network Layer.
CO506.3	Describe the transport layer, Application Layer services and its protocol Headers and analyze the congestion control protocols.
CO506.4	Explain the function of Application Layer and Presentation layer paradigm and protocols.
BEETC-601P	Computer Communication Networks lab

CO506.1	To analyze and select various cables and Connectors used for networking with computer network security
CO506.2	To verify the implementation results on software like NS2 and simulate different networking models and implement different networking protocols.
CO506.3	To understand different data transmission techniques using TCP and UDP Protocol for evaluating the different IP addresses for various systems.
BEETC602T	INTERNET OF THINGS (IoT) (6TH SEM)
CO 602.1	Analyze different design levels of IoT
CO 602.2	Analyse IOT Architecture
CO 602.3	Understand network and communication aspects
CO 602.4	Design a portable IoT using Rasperry Pi and Aurdino
CO 602.5	Analyze applications of IoT in real time scenario
	Internet of Things Lab
BEETC-603T	Wireless Sensor Networks
CO 603.1	By the end of this course, the students shall be able to 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 networking principles and protocols.
CO 603.2	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.
CO 603.3	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.
BEETC-603P	Wireless Sensor Networks Laboratory
CO 603.1	By the end of this course, the students shall be able to 1. Demonstrate advanced knowledge and understanding of the
CO 603.2	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.
CO 603.3	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.
BEETC-604T	Antenna and Wave Propagation
CO 604.1	Describe transmission line characteristics. Calculate antenna parameters (radiation pattern, beam width, lobes, directivity, gain, impedance, efficiency, polarization)
CO 604.2	Analyze wire antennas (monopoles, dipoles, and loops).
CO 604.3	Describe the operation of broadband and traveling wave antennas. Describe the operation of aperture and reflector antennas.
CO 604.4	Analyze and design Microstrip antennas.
BEETC-605T	Effective technical Communication
CO 605.1	acquire knowledge of structure of language.
CO 605.2	Build vocabulary and face interview process and can become employable.
CO 605.3	develop business writing skills.
CO 605.4	Understand technical and scientific writing skills.
	B. E. Seventh Semester
BEETC701T	DSP PROCESSOR AND ARCHITECTURE
CO 701.1	To study Programmable DSP Processor.
CO 701.2	To study the architecture & addressing modes of fixed point processor TMS320C5X.
CO 701.3	To describe the instruction set of TMS320C5X and write Programs for processing signals.
CO 701.4	To describe the architecture, instruction set & write programs using floating point DSP processor TMS320C54X.
CO 701.5	To Compare DSP processors like C5X, C54X and C6X and design & implement DSP algorithm using code composer studio of TMS320C6X and Motorola DSP563XX.
CO 701.6	To design decimation filter, interpolation filter & wavelet filter.
BEETE701P	DSP PROCESSOR AND ARCHITECTURE
CO 701.1	Understand the architecture of TMS and Motorola Processors.
CO 701.2	Implement different processing algorithms on DSP processors.
CO 701.3	Design different types of filters and study their characteristics.
BEETE702T	TELEVISION AND VIDEO ENGINEERING
CO 702.1	analyze and understand colour T.V. System
CO 702.2	understand fundamental techniques of Different T.V. standards.
CO 702.3	understand Advanced T.V. Technology.
CO 702.4	understand different video recording, display and its consumer application.
BEETE702P	TELEVISION AND VIDEO ENGINEERING LAB
CO 702.1	Study and classify the concept of troubleshoot and repair Develop an understanding of electronics, mechanical and environmental factors involved in maintaining television equipment. Analyze and synthesize TV Pictures, Composite Video Signal, TV Receiver Picture Tubes
CO 702.2	Analyze and synthesize TV Pictures, Composite Video Signal, TV Receiver Picture Tubes
CO 702.3	Develop an understanding of electronics, mechanical and environmental factors involved in maintaining television equipment.
BEENE703T	OPTICAL COMMUNICATION
CO 703.1	learn the basic elements of optical fiber.
CO 703.2	understand the different kinds of losses, signal distortion in optical wave guides & other signal degradation factors.
CO 703.3	classify various optical source materials, LED structures, LASER diodes
CO 703.4	learn the fiber optic receivers such as PIN, APD diodes, receiver operation & performance
CO 703.5	understand the operational principal of WDM, SONET, measurement of attenuation, dispersion, refractive
BEENE704T	Advanced Digital System Design
CO 704.1	Design of combinational & sequential circuit.
CO 704.2	Develop skilled VLSI front end designers
CO 704.3	Implementation of digital system.
CO 704.4	Experimentation on Hardware /Software co-design
BEENE704P	Advanced Digital System Design LAB
CO 704.1	to model, simulate, verify the digital model with hardware description language.

CO 704.2	to design and prototype with programmable logic devices
CO 704.3	to learn the modular design style to create large digital logic circuits.
CO 704.4	to create and simulate basic circuit modules (or macros) using VHDL.
BEETE705T	- MICROELECTROMECHANICAL SYSTEMS AND SYSTEM ON CHIP
CO 705.1	Understand working principles of currently available microsensors, actuators used in Microsystems.
CO 705.2	Apply scaling laws that are used extensively in the conceptual design of micro devices and systems.
CO 705.3	Understand the basic principles and applications of micro-fabrication processes, such as photolithography, ion implantation, diffusion, oxidation, CVD, PVD, and etching.
CO 705.4	Choose a micromachining technique, such as bulk micromachining and surface micromachining for a specific MEMS fabrication process
CO 705.5	Consider recent advancements in the field of MEMS and devices
	B. E. Eighth Semester
BEETE801T	MICROWAVE & RADAR ENGINEERING
CO 805.1	Understand the use of active and passive microwave devices
CO 805.2	Analyze Different UHF components with the help of scattering parameter
CO 805.3	Understand micro strip lines MIC design
CO 805.4	Understand the use of different Klystrons.
CO 805.5	Analyze the different power distribution Tees
CO 805.6	Analyze Scattering Matrix of different UHF components
CO 805.7	Do research with capabilities in the design, development and manufacture of radar systems used in a wide spectrum of applications
CO 805.8	Able for Acquisition of technical competence in specialized areas of Radar engineering
CO 805.9	Able to identify, formulate and model problems and find Radar engineering solutions based on a system approach
BEETE801P	MICROWAVE AND RADAR ENGINEERING
CO 801.1	Describe working of microwave bench.
CO 801.2	Measure power & VSWR of microwave component.
CO 801.3	Analyze the S-parameter of microwave component
BEENE802T	COMPUTER COMMUNICATION NETWORK
CO 802.1	Understand the requirement of theoretical & practical aspect of computer network.
CO 802.2	Understand the network traffic in computer network
CO 802.3	Describe various protocols used in network
CO 802.4	Describe the concept of computer network security
CO 802.5	Understand the different wired & wireless LAN stds. & Routers.
BEENE802P	COMPUTER COMMUNICATION NETWORK
CO 802.1	understand and select various cables and connectors used for networking
CO 802.2	Establish peer to peer computers as well as Local Area Network connectivity
CO 802.3	Effectively use available networking tools in Computer Communication Network
BEETE803T	WIRELESS & MOBILE COMMUNICATION
CO 803.1	Design a model of cellular system communication and analyze their operation and performance
CO 803.2	Quantify the causes and effects of path loss and signal fading on received signal characteristics
CO 803.3	to construct and analyze the GSM system
BEETE804T	WIRELESS SENSOR NETWORK
CO 804.1	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 networking principles and protocols
CO 804.2	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.
CO 804.3	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
BEETE804T	EMBEDDED SYSTEMS
CO 804.1	design embedded based system
CO 804.2	design embedded system based on RTOS and communication protocols
BEETE805T	SATELLITE COMMUNICATION
CO 805.1	Do research with capabilities in the design, development and manufacture of satellite communication systems used in a wide spectrum of applications
CO 805.2	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, classroom learning theory
CO 805.3	Able for Acquisition of technical competence in specialized areas of Satellite Communication engineering
CO 805.4	Able to identify, formulate and model problems and find Satellite Communication engineering solutions based on a system approach.

Course outcomes of Department Computer Science & Engineering

PROGRAM OUTCOMES(POs)	
PO1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems related to Computer Science and Engineering.
PO2	Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems related to Computer Science and Engineering and reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3	Design/development of solutions: Design solutions for complex engineering problems related to Computer Science and Engineering and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations
PO4	Conduct investigations of complex problems: Use research based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO5	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO6	The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the Computer Science and Engineering professional engineering practice
PO7	Environment and sustainability: Understand the impact of the Computer Science and Engineering professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice
PO9	individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

B .TECH THIRD SEMESTER	
B.TECHCSE301T	Applied MATHEMATICS - III
CO401.1	Understand numerical methods, matrices for the solution of linear and nonlinear equations, and the solution of differential equations, among other mathematical processes and activities
CO401.2	Analyse real world scenarios to recognize when matrices and probability are appropriate, formulate problems about the scenarios, creatively model these scenarios (using technology, if appropriate) in order to solve the problems using multiple approaches.
CO401.3	Organise, manage and present data in a clear and concise manner.
CO401.4	Develop an ability to identify, formulate, and/ or solve real world problems.
CO401.5	Understand the impact of scientific and engineering solutions in a global and societal context.
CO401.6	Create the groundwork for post- graduate courses, specialized study, and research in computational mathematics.
BECSE302T	Object Oriented Programming With JAVA
CO302.1	Students able to understand the feature of OOP and JAVA and concept of JVM.
CO302.2	Students can understand the concept of operators , array , string handling , searching and sorting.
CO302.3	Students can able to understand the concepts of Inheritance and Exception Handling.
CO302.4	Students can able to understand the concept of Thread , Life cycle of Thread.
CO302.5	Students understand the concepts of Java Collection.
BECSE303T	Operating System
CO303.1	Explain the basic concept of operating system
CO303.2	Understand the process management policies and scheduling algorithms
CO303.3	design the various memory management techniques.
CO303.4.	Analyse the process Synchronisation techniques.
CO303.5.	Understand file system concepts
CO303.6	Evaluate deadlock detection prevention Mechanism

BECSE304T Computer Architecture & Digital System	
CO304.1	Understand the basic concepts of digital system& apply for problem solving.
CO304.2	Describe the Computer Architecture & addressing modes.
CO304.3	Student will be able to learn thevarious instruction formats.
CO304.4	Student will be able to learn thPerform the arithmetic operations
CO304.5	Student will be able to learn the Design and evaluate various memory management systems.
CO304.6	Illustrate I/O mapped & memory mapped operations
BECSE305T ETHIC IN IT	
CO305.1	CO1. Students should be able o understand the concept to Ethics.
CO305.2	CO2. Students will understand the government electronic surveillance
CO305.3	CO3. Students will understand the Copyrights and Patents.
CO305.4	CO4. Studentsable to understand the uses of quality assurance.
CO305.5	CO5.Students understand the importance of application of Reverse and Forward engg.
CO305.6	CO6. Students will understand the impact of IT on the standard of living and productivity.
BECSE306T Universal Human Values	
CO306.1	Become more awareness of themselves and their surrounding(Family, Society and Nature)
CO306.2	Become more responsible in life and in handling problems with sustainable solution, while keeping human nature in mind .
CO306.3	They would have better critical ability
CO306.4	Become sensitive their commitment towards what they have understand(Human values, human relationship and human society)
BECSE307T ENVIRONMENTAL SCIENCE	
CO307.1	Analyze the current environmental challenges.
CO307.2	Learn their roles as citizens regarding the environment.
CO307.3	Learn the ways to avoid pollution.
CO307.4	Learn how to do water west management.
BECSE308P COMPUTER WORKSHOP 1 LAB	
CO308.1	Analyze basic Concept of HTML
CO308.2	Create web pages using different text formatting tags.
CO308.3	Create different types of forms.
CO308.4	Write simple java script.
CO308.5	Design different types of frame layouts.

CO308.4	Write simple java script.
CO308.5	Design different types of frame layouts.
B .TECH FOURTH SEMESTER	
BECSE401T DISCRETE MATHEMATICS AND GRAPH THEORY	
CO 401.1	Students develop logical understanding of the subject.
CO 401.2	Students utilize the knowledge of Mathematics to solve different to mathematical equations.
CO 401.3	Students can able to select appropriate methods for solving solving problems from engineering fields.
CO 401.4	Students able to make aware about the importance and symbiosis between Mathematics and Engineering.
CO 401.5	Students should be able to: understand permutation
BECSE402T Data Structure and Program Design	
C0402.1	Analyze the complexity of algorithm and sorting techniques.
C0402.2	Apply the concept of stack and queues to solve real world problem.
C0402.3	Describe and implement linked list operation.
C0402.4	Demonstrate different methods for traversing trees.
C0402.5	Utilize the concept of graphs to build solutions. Design and implement searching techniques and hashing functions.
BECSE403T Database Management System	
CO403.1	Understand basic database concepts and data modeling techniques used in database design.
CO403.2	Study the concept of functional dependency and perform the calculus with design database by using different normalization techniques.
CO403.3	Study query processing and perform optimization on query processing.
CO403.4	Understand the concept of transaction processing and different recovery techniques used in RDBMS.
CO403.5	Study and Implement advanced database which are used real time system
BECSE404T Computer Network	
C0404.1	To develop a fundamental understanding of network design principal and performance.
	To know about the layered architecture of OSI & TCP/IP protocol suite.
	To understand about wireless network such as Bluetooth, WIMAX, IEEE 802.11
C0404.2	To learn about design Issues of datalink layer and different framing techniques.
C0404.3	To learn about the design issues of Network layer and IPV4, IPV6 addressing system.
	To know about arrays and how to use arrays for searching and sorting.
	Demonstrate the ability to solve problems using different network algorithms
C0404.4	Classify the routing protocols and analyze how to map IP addresses. Identify the issues related to transport layer, congestion control.

CO404.4	Describe Quality of service, DNS Application layer Protocols & Network security issues.
BECSE405T	Theory Of Computation
CO405.1	Design finite automata and its minimization along with moore and mealy Machine.
CO405.1	Apply regular expression and create grammar for the same.
CO405.1	apply with context free grammer and various normal forms of CFGs.
CO405.1	Create Push down Automata for the given CFG and Inter Conversion for the same.
CO405.1	Create Turing Machine for the grammer and deal with recursive and recursively Enumerable Language.
BE4SE406T	System Programming
CO406.1	Able to understand Machin Stucture and Assembler
CO406.2	Acquired the knowledge of working of assembler and its use with various searching And sorting techniques.
CO406.3	Enriched with the knowledge of macros, its facilities and its use.
CO406.4	Students can able to understand the concepts of Linker and Loader
CO406.5	Students can be able to understand the Compiler , its phases , LEX , YACC
BECSE407P	COMPUTER WORKSHOP-II
CO407.1	Declare python operators, numeric data types and string operation
CO407.2	Implement tuple , conditional blocks and loops in python
CO407.3	Apply functions, module , and packages using python
CO407.4	Handle exception, sorting algorithm and various data structures
CO407.5	Implemnt various file operation using python and implemnt concept concepts of object oriented programming and python database
BECSE408	INTERSHIP
CO408.1	Student should understand about new technology.
CO408.2	Student should Under go with minimum Two or Three Week Internship.
CO408.3	Minimum One Month Internship Desirable.
CO408.4	After completion of Internship Student should Report to the Department.
	B .TECH FIFTH SEMESTER
BTECH_CSE501IP	Artificial Intellengence
CO501.1	Students are able to understand the Artificial Intelligence and their applications
CO501.2	Students can acquire the knowledge of Informed search algorithm and Uninformed search algorithm
CO501.3	Students can be able to understand Structured Knowledge Representation and Knowledge Representation problems
CO501.4	Students able to understand the handling uncertainty knowledge and problem solving , Bayesian Networks, Fuzzy Logic
CO501.5	Students can be able to understand learning and learning probabilistic models .

CO501.6	Students should be able to understand Expert systems and Natural Language
BTECH CSE_502T Design and Analysis of Algorithm	
CO502.1	Illustrate different approaches for analysis and design of efficient algorithms and Analyze performance of various algorithms using asymptotic notations.
CO502.2	Determine and Apply various divide & conquer strategies and greedy approaches for solving a given computational problems.
CO502.3	Demonstrate and solve various realtime problems using the concept of dynamic programming.
CO502.4	Make use of backtracking and graph traversal techniques for solving real-world problem.
CO502.5	Real and classify the NP-hard and NP-complete problems.
BTECH CSE-503T Software Engineering and Project Management	
CO503.1	Understand Software engg methods, practices, process models and application
CO503.2	Analyse various software engg life cycle models and apply methods for design and development of software project .
CO503.3	Analyse and extract requirement for product and translate this into a document design using diff modeling technique.
CO503.4	Understand and apply software testing method and types, and to understand debugging concept with various testing method.
CO503.5	Identify and apply the principals , processes and main knowledge areas for software project management.
BTECH_CSE-504.1 TCP/IP	
CO504.1.1	Enumerate the layers of the TCPIP Model
CO504.1.2	Analyse the services of TCPIP protocol and be able to deal with its layers.Also the concepts of IP addressing
CO504.1.3	Acquire the knowledge of routing protocol
CO504.1.4	Familiarize students with the basic computer network protocol and how they can be used to help develop and execute networks.
CO504.1.5	Generate the solution for basics issues o internet mechanism and its security
BTECH_CSE 505T EFFECTIVE TECHNICAL COMMUNICATION	
CO505.1	Students have better reading comprehension, pronunciation, and functional English grammar.
CO505.2	Students are able to write letters and resumes
CO505.3	Students are able to organize their thoughts for Effective presentation and writing.
CO505.4	Students are able to learn skills to present themselves well in aninterview, and handle a Group Discussion.
BTECH CSE_505P PROFESSIONAL SKILL -I PRACTICAL	
CO505.1	List various tags HTML , DHTML and use these, apply Cascaded style sheet to create web pages.
CO505.2	Understand and evaluate web pages application architecture, technologies and frameworks
CO505.3	Apply the knowledge of web technology in developing web applications
CO505.4	Develop an interactive web applications using ASP.NET.
CO505.5	Evaluate different solution in field of web application development

BTECH CSE_506	Yoga and Meditation
CO506.1	Explain the state of the evidence on causal associations between mindfulness and various health outcomes and disease risk factors (e.g., diet, obesity, physical activity, sleep, depression and anxiety)
CO506.2	Describe plausible mechanisms by which mindfulness may influence health.
CO506.3	Assess studies in the field for methodological rigor.
CO506.4	Understand strengths and weaknesses of current research on mindfulness and health.
CO506.5	Define the primary mindfulness intervention used in health care and community setting.
	Describe first person experience with mindfulness practices and how the practice helped personal well-being, if at all.
B .TECH SIXTH SEMESTER	
BTECH_CSE-601T	Compiler Design
CO601.1	Students can understand the concept of Phases of Compiler
CO601.2	Students can able to understand the concepts of Parser
CO601.3	Students can able to understand the concept of Intermediate Code Generation.
CO601.4	Students understand the concepts of SDTC
CO601.5	Be exposed to compiler optimization
BTECH_CSE-602	CLUSTER AND CLOUD COMPUTING
CO602.3.1	Understand the different Cloud Computing environment.
CO602.3.2	Analyze virtualization technology and install virtualization software.
CO602.3.3	Use appropriate data storage technique on Cloud ,based on Cloud application
CO602.3.4	Apply security in cloud applications
CO602.3.5	Use advance techniques in Cloud Computing.
BTEH CSE 603.3T	Distributed Operating Systems
CO603.3.1	Learn the principle , architecture , algorithms and programming models used in distributed system
CO603.3.2	Understand the core concept of distributed system .
CO603.3.3	design and implement sample distributed system using diff algorithm
CO603.3.4	Understand the distributed file system , architecture and mechanism .
CO603.3.5	Analyse the distributed scheduling , issues in load distributing , components of load distributing algorithm.
BTEH CSE 604.3T	Environmental Engineering
CO 604.1	Explore the components of biosphere and impact of human activity on Environment.
CO 604.2	Summarize the causes and sources of pollutants, and their impact on global environment.
CO 604.3	Develop ethics and scientific awareness about waste generation and treatment.
CO 604.4	Identify sources and types of wastes and its management.
CO 604.5	Understand noise, noise pollution and control.
BTECHCSE_605P	PROFESSIONAL SKILL LAB-II - PRACTICAL

CO605.1	Describe the components and structure of a mobile development framework.
CO605.2	Understand the specific requirements, possibilities and challenges when developing for mobile context.
CO605.3	Apply Java programming concept to Android application development
CO605.4	Design and develop user Interfaces for the Android platform
CO605.5	Publish an application to the Android market.
BTECH_CSE-606P	HARDWARE LAB
CO606.1	The student will learn the internal Architecture of Microprocessor and Microcontroller.
CO606.2	Describe the concept of addressing modes and timing diagram of Microprocessor and Microcontroller.
CO606.3	Demonstrate the concept of Interrupts and its use.
CO606.4	Describe the concept of serial and parallel using serial-parallel data communication concept.
CO606.5	Interface Various hardware with Microprocessor.
BTECH_CSE-608T	Economics of IT Industry
CO608.1	The learners will be able to distinguish between Micro and Macroeconomics.
CO608.2	The learners will be able to relate economics concept with IT industry.
CO608.3	The learners will be able to identify key trends in IT industry.
CO608.4	The learners will be able to understand the key economic drivers of IT industry.
BTECH_CSE609	Intellectual Property Rights (Audit Course)
CO609.1	Understand fundamental aspects of Intellectual property Rights
CO609.2	Apply knowledge on patents, patent regime in India and abroad and registration
CO609.3	Be capable of getting copyrights and its related right and registration aspects
CO609.4	Be capable of getting trademarks and registration aspects
CO609.5	Apply knowledge on Design, Geographical Indication (GI), plant variety and Layout Design Protection and their registration aspects
BTCME607P	Mini Project
CO607.1	To develop an understanding of application in real life
CO607.2	To develop research skills of students
CO607.3	To help the students in exploring career opportunities in their area of interest
CO607.4	Show the ability to locate and use technical information from multiple sources.
CO607.5	Learn to work as a team and to focus on getting a working project done on time with each
B .TECH SEVENTH SEMESTER	
BECSE401T	Data Warehouse & Mining (DWM)
CO401.1	Students should get the knowledge of data preprocessing for data warehouse and data mining.

CO401.2	Solve basic statistical calculations on data and describe the aspect of data pre-processing.
CO401.3	Understanding the concepts of OLAP analytical processing in data warehousing & mining
CO401.4	Understand various datamining functionalities and Apply the concept of datamining components and technique in designing data mining systems.
CO401.5	Understand fundamental concept of frequent Items sets,closed Items sets and mining various kinds of association rules.
CO401.6	Understanding the concept of Business Intelligence and their applications , developing of BI system
BECSE402T LANGUAGE PROCESSOR	
CO402.1	Students able to understand the feature of Compilers
CO402.2	Students can understand the concept of Phases of Compiler
CO402.3	Students can able to understand the concepts of Parser
CO402.4	Students can able to understand the concept of Intermediate Code Generation
CO402.5	Students understand the concepts of SDTC .
CO402.6	Students understoodthe general concepts of Problems in code generation
BECSE403T TCP/IP	
CO403.1	Understand the architecture and underlying technology of wired and wireless LANs, switched WAN and Point to Point WAN.
CO403.2	Figure out the ability to perform both classfull and classless Subnetting techniques for IPv4 and IPv6network.
CO403.3	Interpret the ability to decode Ethernet frames, IP Packets (IPv4 and IPv6) and TCP or UDP segments, ARP and RARP protocol.
CO403.4	Understand Internet Control Message Protocols (ICMPv4 and ICMPv6) and Routing protocols.
CO403.5	Understand Mobile IP, Multicasting, IGMP and Multicast routing protocols.
BECSE404T MOBILE COMPUTING	
CO403.1	To provide the student with an understanding of the Cellular concept, Frequency reuse, Hand-off strategies.
CO403.2	To provide the student with an understanding of Equalization and diversity reception techniques and also give the mobile computing architecture
CO403.3	To give the student an understanding of digital cellular systems (GSM, GPRS, WAP, cdma2000, and W-CDMA,IEEE802.11)
CO403.4	Enriched with the knowledge of mobility management & control by using aglet & agent TCL architecture
CO403.5	To design successful mobile (WAP) and pervasive computing applications and services
CO403.6	To give practical experience in the area through the design and execution of a modest research project by using android
BECSE45P Project & Seminar	
CO45.1	Understand problem identification, which formulation and solution.
CO45.2	Identify and summaries the appropriate literature review and analyze previous research work and relate them.
CO45.3	Demonstrate the knowledge, skills attitude of electronic engineers through the implemented product
CO45.4	To present the project outlined approach and expected result using good oral presentation skill.
CO45.5	To work in team and communicate with others.
CO45.6	To compile analyze and present the output of project in form of report.

	BE EIGHTH SEMESTER
BECSE406T	Distributed Operating Systems
CO406.1	To learn the principles, architectures, algorithms and programming models used in distributed systems.
CO406.2	Understand the implications of Distributed System on society, primarily in the aspects of communication, commerce, crime, ethics, and privacy;
CO406.3	To learn the requirement and importance of algorithmic functions and computer programming in distributed systems.
CO406.4	Introduction to the fundamentals of distributed computer systems, assuming the availability of facilities for data transmission.
CO406.5	The structure of distributed systems using multiple levels of software is emphasized.
CO406.6	Provide knowledge of and proficiency in basic techniques for the develop, design and implement sample distributed systems.
BECSE407T	Information and Cyber Security
CO407.1	Student will be able to understand the different types of Security services.
CO407.2	Students will be able to implement various algorithms in computer network.
CO407.3	Student will be able to understand different applications of Cyber Security.
CO407.4	Student will able to understand different Message Authentication.
CO407.5	Student will able to understand Introduction to Network.
CO407.6	Student will able to understand different Software Vulnerability.
BECSE 408T	CLUSTER AND CLOUD COMPUTING
CO408.1	Understand the different cloud Computing environment
CO408.2	Analyze virtualization technology and install virtualization software.
CO408.3	Understand about Big data and Hadoop technology.
CO408.4	Apply security in cloud application.
CO408.5	Understand about application development using different technologies and ADO.NET
CO408.6	Understand deployment of application to Windows Azure Cloud.
BECSE409T	Advanced Wireless Sensor Networks
CO409.1	To Understand the basic WSN technology and supporting protocols, with emphasis placed on standardization basic sensor systems and provide a survey of sensor technology
CO409.2	Understand the medium access control protocols and address physical layer issues
CO409.3	Learn key routing protocols for sensor networks and main design issues
CO409.4	Learn transport layer protocols for sensor networks, and design requirements
CO409.5	Understand the Sensor management ,sensor A11
BECSE410P	Project & Seminar
CO410.1	Understand problem identification, which formulation and solution.

CO410.2	Identify and summaries the appropriate literature review and analyze previous research work and relate them.
CO410.3	Demonstrate the knowledge, skills attitude of electronic engineers through the implemented product
CO410.4	To present the project outlined approach and expected result using good oral presentation skill.
CO410.5	To work in team and communicate with others.