1.1.3 & 1.2.1

<u>**Supporting Documents- IKGPTU Amritsar Campus**</u>

Mapping of Courses to Employability/ Skill Development

Name of the Department: Mechanical Engineering

BTPHXX-18 - Physics & Physics Lab

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1: To be able to understand the basic principles of Quantum mechanics and to apply these to the complex phenomenon	√		√		√		√	√	√	√	√	√	Understandi ng	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
CO 2: To be able to understand the concept of wave packets using Heisenberg's uncertainty principle.			√		√		√	√	√	√	√	√	Understandi ng	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
CO 3: To be able to apply Schrodinger's wave equations to study the complex physical phenomenon.			√		√		√	√	√	√	√	√	Understandi ng	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
CO 4: To be able to understand the structure of crystalline solids by applying knowledge of crystallography.			√		√		√	√		√		√	Understandi ng	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams

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Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO
CO 5: To be able to understand semiconducting materials by using the concepts of band theory of solids.	√	√	√	√	√	√	√	√	√	√	√	√	Applying	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams

BTAMXX-18 - Maths-1

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1:Students will be able to remember terminologies and formulae in matrices, complex	√		√		√		√	√	√	√	√	√	Understandi ng	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
CO2: Students will be able to understand and interpret the concepts of matrices, complex			√		√		√	√	√	√	√	√	Understandi ng	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
CO3:Students will be able to compare and analyze the methods in matrices, complex numbers	√	√	√	√	√	√	√	√	√	√	√	√	Applying	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams

BTEE101-18 Basic Electrical Engineering

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1: Have the knowledge of DC circuits, AC Circuits, basic magnetic circuits, working principles of electrical machines, and components	√	√	√		√		√	√	√	√	√	√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
CO 2: Be able to analyze of DC circuits, AC Circuits		√	√		√		√	√	√	√	√	√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
CO 3: Understand the basic magnetic circuits and apply it to the working of electrical machines		√	√		√		√	√	√	√	√	√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
CO 4: Be introduced to types of wiring, batteries, and LT switchgear.		√	√		√		√	√		√		√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams

BTEE101-18 Basic Electrical Engineering Lab

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1: The ability to use common electrical measuring instruments and understand the fundamentals of electrical	√	√	√		√		√	√	√	√	√	√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
CO 2: The ability to make electrical connections, and measure power, power factor using appropriate equipments.		√	√		√		√	√	√	√	√	√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
CO 3: Have the knowledge of electrical machines, components and their ratings		√	√		√		√	√	√	√	√	√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
CO 4: Understand the operation of transformers and electrical machines		√	√		√		√	√		√		√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams

Paper BTME101-18 Engineering Graphics & Design

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1: design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental.	√	√	√	√	√	√	√	√	√	√	√	√	Design	Yes	Minor Exams, Quiz, Assignments, End Term Exams

Course Outcome													Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO
CO 2: to prepare to communicate effectively.	√	√	√	√	√	√	√	√	√	√	√	√	Communicate	Yes	Minor Exams, Quiz, Assignments, End Term Exams
CO 3: to prepare to use the techniques, skills, and modern engineering tools necessary for engineering practice.	√	√	√	√	√	√	√	√	√	√	√	√	Apply	Yes	Minor Exams, Quiz, Assignments, End Term Exams

BMPD101-18 Mentoring and professional Development

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1: The student will be able to effectively communicate and present technical material.	√	√	√		√		√	√	√	√	√	√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
CO2: Ability to think critically and creatively to generate innovative and optimum solutions.		√	√		√		√	√	√	√	√	√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
CO3:The student will be able to identify, evaluate and synthesise information from a range of sources to optimise process engineering design		√	√		√		√	√	√	√	√	√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO
CO4: Engage in continuous education, training and research, and take control of their own learning and overall development.		√	√		√		√	√		√		√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams

BTCH101-18 - Chemistry -1

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO
Analyse microscopic chemistry in terms of atomic and molecular orbitals and intermolecular forces.	√		√		√		√	√	√	√	√	√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
Rationalise bulk properties and processes using thermodynamic considerations.			√		√		√	√	√	√	√	√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
Distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic			√		√		√	√	√	√	√	√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
Rationalise periodic properties such as ionization potential, electronegativity, oxidation states and electronegativity.			√		√		√	√		√		√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO
List major chemical reactions that are used in the synthesis of molecules.	√	√	√	√	√	√	√	√	√	√	√	√	Applying	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams

BTCH102-18 - Chemistry Lab

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO
Estimate rate constants of reactions from concentration of reactants/products as a function of time	√		√		√		√	√	√	√	√	√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
Measure molecular/system properties such as surface tension, viscosity, conductance of solutions, redox potentials, chloride			√		√		√	√	√	√	√	√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
Synthesize a small drug molecule and analyse a salt sample			√		√		√	√	√	√	√	√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams

BTAMXX-18 Mathematics II

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Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1: The mathematical tools needed in evaluating multiple integrals and their usages.	√		√	√	√		√	√	√	√	√	√	Understandi ng	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
CO 2: The effective mathematical tools for the solutions of differential equations that model physical processes.			√	√	√		√	√	√	√	√	√	Understandi ng	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
CO 3: The tools of differentiation and integration of functions that are used in various techniques dealing engineering problems.			√	√	√		√	√	√	√	√	√	Understandi ng	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams

BTPS101-18 Programming for Problem Solving

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO
To formulate simple algorithms for arithmetic and logical problems.	√	√	√	√	√	√	√	√	√	√	√	√	Understandi ng	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams

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To translate the algorithms to programs (in C language).		√	√	√	√	√	√	√	√	√	√	√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
To test and execute the programs and correct syntax and logical errors.		√	√	√	√	√	√	√	√	√	√	√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
To implement conditional branching, iteration and recursion.		√	√		√	√		√		√		√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
To decompose a problem into functions and synthesize a complete program using divide and conquer approach.		√	√		√	√		√		√		√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
To use arrays, pointers and structures to formulate algorithms and programs.		√	√		√	√		√		√		√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
To apply programming to solve matrix addition and multiplication problems and searching and sorting problems.		√	√		√	√		√		√		√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
To apply programming to solve simple numerical method problems, namely rot finding of function, differentiation of function and		√	√		√	√		√		√		√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams

BTPS102-18 Programming for Problem Solving Lab

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO
To formulate the algorithms for simple problems	√	√	√	√	√	√	√	√	√	√	√	√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
To translate given algorithms to a working and correct program	√	√	√	√	√	√	√	√	√	√	√	√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
To be able to correct syntax errors as reported by the compilers	√	√	√	√	√	√	√	√	√	√	√	√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
To be able to identify and correct logical errors encountered at run time	√	√	√		√	√		√		√		√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
To be able to write iterative as well as recursive programs	√	√	√		√	√		√		√		√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams

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To be able to represent data in arrays, strings and structures and manipulate them through a program	√	√	√		√	√		√		√		√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
To be able to declare pointers of different types and use them in defining self referential structures.	√	√	√		√	√		√		√		√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
To be able to create, read and write to and from simple text files.	√	√	√		√	√		√		√		√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams

Paper BTMP 101-18 Workshop/Manufacturing Practices

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1: gain knowledge of the different manufacturing processes which are commonly employed in the industry, to fabricate	√	√	√	√	√	√	√			√	√	√	Understanding	Yes	Minor Exams, Project based learning, Assignments,End Term Exams
CO 2: able to fabricate components with their own hands.	√	√	√	√	√	√	√			√	√	√	Apply	Yes	Minor Exams, Project based learning, Assignments,End Term Exams

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO
CO 3: Get practical knowledge of the dimensional accuracies and dimensional tolerances possible with different manufacturing	√	√	√	√	√	√	√			√	√	√	Understanding	Yes	Minor Exams, Project based learning, Assignments,End Term Exams
CO 4: By assembling different components, they will be able to produce small devices of their interest.	√	√	√	√	√	√	√			√		√	Apply	Yes	Minor Exams, Project based learning, Assignments,End Term Exams

Paper BTHU101-18 English

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO
The objective of the course is to help the students become the independent users of English language.	√	√	√	√	√	√	√			√	√	√	Understanding	Yes	Minor Exams, Project based learning, Assignments,End Term Exams
Students will acquire basic proficiency in reading & listening, comprehension, writing and speaking skills.	√	√	√	√	√	√	√			√	√	√	Apply	Yes	Minor Exams, Project based learning, Assignments,End Term Exams
Students will be able to understand spoken and written English language, particularly the language of their chosen technical field.	√	√	√	√	√	√	√			√	√	√	Understanding	Yes	Minor Exams, Project based learning, Assignments,End Term Exams

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Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO
They will be able to converse fluently.	√	√	√	√	√	√	√			√		√	Apply	Yes	Minor Exams, Project based learning, Assignments,End Term Exams

Paper BTHU102-18 English Lab

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO
The objective of the course is to help the students become the independent users of English language.	√	√	√	√	√	√	√			√	√	√	Understandi ng	Yes	Minor Exams, Project based learning, Assignments,End Term Exams
Students will acquire basic proficiency in listening and speaking skills.	√	√	√	√	√	√	√			√	√	√	Apply	Yes	Minor Exams, Project based learning, Assignments,End Term Exams
Students will be able to understand spoken English language, particularly the language of their chosen technical field.	√	√	√	√	√	√	√			√	√	√	Understandi ng	Yes	Minor Exams, Project based learning, Assignments,End Term Exams
They will be able to converse fluently	√	√	√	√	√	√	√			√		√	Apply	Yes	Minor Exams, Project based learning, Assignments,End Term Exams

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BMPD101-18 Mentoring and professional Development

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1: The student will be able to effectively communicate and present technical material.	√	√	√		√		√	√	√	√	√	√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
CO2: Ability to think critically and creatively to generate innovative and optimum solutions.		√	√		√		√	√	√	√	√	√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
CO3:The student will be able to identify, evaluate and synthesise information from a range of sources to optimise process engineering design		√	√		√		√	√	√	√	√	√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
CO4: Engage in continuous education, training and research, and take control of their own learning and overall development.		√	√		√		√	√		√		√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams

Paper BTME301-18 Fluid Mechanics

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1: Understand the concept of fluids and their properties.	√	√	√			√	√		√	√		√	Understanding	Yes	Minor Exams, Quiz, Assignments, End Term Exams
CO 2:Apply the concept to solve the problems related to statics, dynamics and kinematics	√	√	√			√	√		√	√		√	Understanding	Yes	Minor Exams, Quiz, Assignments, End Term Exams
CO3: Use and apply dimensional analysis and similitude techniques to various physical	√	√	√			√	√		√	√		√	Understanding	Yes	Minor Exams, Quiz, Assignments, End Term Exams
CO4: Distinguish various types of flows and learn flow measurement methods.	√	√	√			√	√		√	√		√	Analyse	Yes	Minor Exams, Quiz, Assignments, End Term Exams

BTME302-18 Theory of Machines -1

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1: Understand constructional and working features of important machine elements.	√	√	√	√	√	√			√		√	√	Understanding	Yes	Minor Exams, Assignments, End Term Exams
CO2: Design belt, rope and chain drives for transmission of motion from one shaft to	√	√	√	√	√	√			√		√	√	Understanding	Yes	Minor Exams, Assignments, End Term Exams
CO3: Identify different Cam and follower pairs for different applications and construct cam	√	√	√	√	√	√			√		√	√	Understanding	Yes	Minor Exams, Assignments, End Term Exams
CO4: Understand the function of brakes, dynamometers, flywheel and governors.	√	√	√	√	√	√			√		√	√	Understanding, Applying	Yes	Minor Exams, Assignments, End Term Exams

BTME303-18 : Machine Drawing

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1: Read, draw and interpret the machine drawings and related parameters.	√	√	√							√	√	√	Understanding	Yes	Minor Exams, Class and Home Assignments, End Term Exams

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO
CO2: Use standards used in machine drawings of machine components and assemblies.	√	√	√							√	√		Applying	Yes	Minor Exams, Class and Home Assignments, End Term Exams
CO3: Learn the concept of limits, fits and tolerances in various mating parts.	√	√	√							√	√		Understanding	Yes	Minor Exams, Class and Home Assignments, End Term Exams
CO4: Visualize and generate different views of a component in the assembly.	√	√	√		√					√	√	√	Applying	Yes	Minor Exams, Class and Home Assignments, End Term Exams
CO5: Use CAD tools for making drawings of machine components and assemblies.	√	√	√		√					√	√	√	Applying	Yes	Minor Exams, Class and Home Assignments, End Term Exams

BTME304-18 STRENGTH OF MATERIALS-I

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1: Understand the concepts of stress and strain at a point, in the members subjected to axial, bending, torsional loads and	√	√	√			√			√	√	√	√	Understanding	Yes	Minor Exams, Assignments, End Term Exams

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO
CO 2: Determine principal stresses, maximum shearing stress and their angles, and the stresses acting on any arbitrary plane within a	√	√	√			√			√	√	√	√	Understanding and Analysing	Yes	Minor Exams, Assignments, End Term Exams
CO 3: Find bending moment and shear force over the span of various beams subjected to different kinds of loads.	√	√	√		√	√			√	√	√	√	Analysing	Yes	Minor Exams, Assignments, End Term Exams
CO 4: Calculate load carrying capacity of columns and struts and their buckling strength.	√	√	√		√	√			√	√	√	√	Analysing	Yes	Minor Exams, Assignments, End Term Exams
CO 5: Evaluate the slope and deflection of beams subjected to loads.	√	√	√		√	√			√	√	√	√	Analysing	Yes	Minor Exams, Assignments, End Term Exams

BTME305-18 Basic Electronics Engineering

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO
Understand construction of diodes and their rectifier applications.	√	√	√			√			√	√	√	√	Understanding	Yes	Minor Exams, Assignments, End Term Exams

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO
Appreciate the construction and working bipolar junction transistors and MOSFETs.	√	√	√			√			√	√	√	√	Understanding and Analysing	Yes	Minor Exams, Assignments, End Term Exams
Design Op-Amp IC based fundamental applications.	√	√	√		√	√			√	√	√	√	Analysing	Yes	Minor Exams, Assignments, End Term Exams

Paper Basic Thermodynamics BTME 305-18

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1: Apply energy balance to Systems and Control Volumes in situations involving heat and work interactions.	√	√	√		√		√	√	√	√	√		Applying	Yes	Minor Exams, Quiz, demonstrations through videos/ lab, End Term Exams
CO2: Evaluate changes in thermodynamic properties of substances		√	√	√	√				√		√	√	Applying	Yes	Minor Exams, Quiz, demonstrations through videos/ lab, End Term Exams
CO3:Evaluate performance of energy conversion devices		√	√	√	√				√		√	√	Applying	Yes	Minor Exams, Quiz, demonstrations through videos/ lab, End Term Exams

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO
CO4:Explain and apply various gas power and vapor power cycles		√	√	√	√	√			√	√	√		Understanding	Yes	Minor Exams, Quiz, demonstrations through videos/ lab, End Term Exams

BTME306-18 Strength of Material Lab

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1: Measure the various mechanical properties such as tensile and compressive strength, impact strength, torsion strength and fatigue	√	√	√	√		√			√	√	√	√	Understanding	Yes	Quiz, Viva
CO 2: Calculate load carrying capacity of long columns and their buckling strength.	√	√	√	√		√			√	√	√	√	Understanding and Analysing	Yes	Quiz, Viva

BTME307-18 Theory of Machines Lab

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO

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CO																	
CO1: Understand constructional and working features of important machine elements.	√	√	√	√	√	√			√			√	√	Understanding	Yes	Minor Exams, Assignments, End Term Exams
CO2: Design belt, rope and chain drives for transmission of motion from one shaft to																
another	√	√	√	√	√	√			√			√	√	Designing	Yes	Minor Exams, Assignments, End Term Exams
CO3: Identify different Cam and follower pairs for different applications and construct cam																
profile for required follower motion.	√	√	V	√	√	√			√			√	√	Designing	Yes	Minor Exams, Assignments, End Term Exams
CO4: Understand the function of brakes, dynamometers, flywheel and governors.	√	√	√	√	√	√			√			√	√	Understanding, Applying	Yes	Minor Exams, Assignments, End Term Exams

Paper BTME308-18 Fluid Mechanics Lab

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1: Distinguish various type of flows and flow measurement methods and concept of															
statics and dynamics of liquids.	√				√		√		√	√		√	Understandi ng	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
CO 2: Determine discharge and head loss, hydraulic and friction coefficient, for different															
types of flow in pipe and open channels.							√		√	√		√	Analyse	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams

BMPD301-18 Mentoring and professional Development

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1: The student will be able to effectively communicate and present technical material.	√	√	√		√		√	√	√	√	√	√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
CO2: Ability to think critically and creatively to generate innovative and optimum solutions.		√	√		√		√	√	√	√	√	√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
CO3:The student will be able to identify, evaluate and synthesise information from a range of sources to optimise process engineering design		√	√		√		√	√	√	√	√	√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
CO4: Engage in continuous education, training and research, and take control of their own learning and overall development.		√	√		√		√	√		√		√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams

BTME401-18 APPLIED THERMODYNAMICS

Course Outcome	PO 1 (Engineering Knowledge)	PO 2 (Problem Analysis)	PO 3 (Design/Development)	PO 4 (Conduct)	PO 5 (Modern Tool usage)	PO 6 (The Engineer and Society	PO 7 (Environment and	PO 8 (Ethics)	PO 9 (Individual and Team	PO 10 (Communication)	PO 11 (Project Management	PO 12 (Life long Learning)	Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1: Explain the functioning and performance evaluation of reciprocating air compressors.	√		√	√	√	√	√		√	√		√	Understanding, Applying and Designing	Yes	Minor Exams, Assignments, End Term Exams

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO
CO 2: Analyze the combustion phenomenon in boilers and I.C. engines.	√	√		√	√	√	√	√	√	√	√	√	Understanding, Applying	Yes	Minor Exams, Assignments, End Term Exams
CO 3: Use of Steam Tables and MollierChart to solve vapour power cycle problems.	√	√	√	√	√	√	√	√	√	√	√	√	Understanding, Applying	Yes	Minor Exams, Assignments, End Term Exams
CO 4: Demostrate the constructional features and working of steam power plants and to evaluate their performance.	√	√	√	√	√	√	√		√	√	√	√	Understanding, Applying	Yes	Minor Exams, Assignments, End Term Exams

Paper BTME 402-18 Fluid Machines

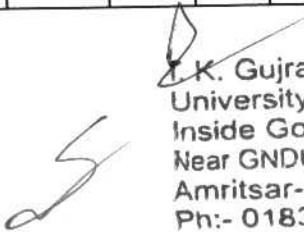| Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1: Determine discharge and head loss, hydraulic and friction coefficient, for different types of flow in pipe and open channels.	√	√	√			√	√		√	√		√	Knowledge	Yes	Lectures, Tutorials, Assignments, Powerpoint Presentations, Numericals etc.
CO 2:Know about constructional details, working and design aspects of runner/wheel and evaluate the performance of various	√	√	√			√	√		√	√		√	Knowledge	Yes	Lectures, Tutorials, Assignments, Powerpoint Presentations, Numericals etc.

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CO 3: Know about constructional details, working and evaluate the performance of centrifugal pump under different vane	√	√	√			√	√		√	√		√	Knowledge	Yes	Lectures, Tutorials, Assignments, Powerpoint Presentations, Numericals etc.
CO 4: Know about constructional details, working and evaluate the performance of reciprocating pump and evaluate the effect															
CO5: Know about constructional details and working of hydraulic devices like fluid coupling, accumulator and intensifier.													Knowledge	Yes	Lectures, Tutorials, Assignments, Powerpoint Presentations, Numericals etc.

BTME403-18 STRENGTH OF MATERIALS-II

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1: Understand the concepts of stress and strain at a point, in the members subjected to axial, bending, torsional loads and	√	√	√			√			√	√	√	√	Understanding	Yes	Minor Exams, Assignments, End Term Exams
CO 2: Determine principal stresses, maximum shearing stress and their angles, and the stresses acting on any arbitrary plane within a	√	√	√			√			√	√	√	√	Understanding and Analysing	Yes	Minor Exams, Assignments, End Term Exams

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Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO
CO 3: Find bending moment and shear force over the span of various beams subjected to different kinds of loads.	√	√	√		√	√			√	√	√	√	Analysing	Yes	Minor Exams, Assignments, End Term Exams
CO 4: Calculate load carrying capacity of columns and struts and their buckling strength.	√	√	√		√	√			√	√	√	√	Analysing	Yes	Minor Exams, Assignments, End Term Exams
CO 5: Evaluate the slope and deflection of beams subjected to loads.	√	√	√		√	√			√	√	√	√	Analysing	Yes	Minor Exams, Assignments, End Term Exams

BTME404-18 MATERIALS ENGINEERING

Course Outcome	PO 1 (Engineering Knowledge)	PO 2 (Problem Analysis)	PO 3 (Design/Development)	PO 4 (Conduct)	PO 5 (Modern Tool usage)	PO 6 (The Engineer and Society)	PO 7 (Environment and)	PO 8 (Ethics)	PO 9 (Individual and Team)	PO 10 (Communication)	PO 11 (Project Management)	PO 12 (Life long Learning)	Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1: Illustrate the significance of structure-property-correlation for engineering materials including ferrous and	√	√		√	√	√	√		√	√	√	√	Understanding, Applying and Designing	Yes	Minor Exams, Assignments, End Term Exams
CO 2: Explain the use and importance of various heat treatment processes used for engineering materials and their practical applications.	√		√	√	√	√	√	√	√	√	√	√	Understanding, Applying	Yes	Minor Exams, Assignments, End Term Exams
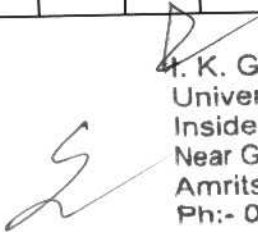
Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO
CO 3: Identify the various structural changes occurred in metals with respect to time temperature transformations.	√	√	√	√	√	√	√		√	√	√	√	Understanding, Applying	Yes	Minor Exams, Assignments, End Term Exams
CO 4: Interpret the significance of Fe-C and TTT diagram for controlling the desired structure and properties of the materials.	√	√		√	√	√	√	√	√	√	√	√	Understanding, Applying	Yes	Minor Exams, Assignments, End Term Exams

BTME405-18 : Theory of Machines -II

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1: Understand the basic concepts of inertia forces & couples applied to reciprocating parts of a machine.	√	√	√	√							√	√	Understanding & Applying	Yes	Minor Exams, Assignments, End Term Exams
CO2: Understand balancing of rotating and reciprocating parts of machines.	√	√	√	√	√						√	√	Understanding & Applying	Yes	Minor Exams, Assignments, End Term Exams
CO3: Select suitable type of gears for different application and analyse the motion of different elements of gear trains.	√	√	√	√	√						√	√	Understanding & Applying	Yes	Minor Exams, Assignments, End Term Exams

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO
CO4: Understand the concept and application of gyroscopic effect.	√	√	√	√	√							√	Understanding & Applying	Yes	Minor Exams, Assignments, End Term Exams
CO5: Gain knowledge of kinematic synthesis.	√	√	√	√	√						√	√	Understanding & Applying	Yes	Minor Exams, Buisness Quiz, End Term Exams

EVS101-18 ENVIRONMENTAL SCIENCE

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO
Students will enable to understand environmental problems at local and national level through literature and general	√	√	√	√							√	√	Understanding & Applying	Yes	Minor Exams, Assignments, End Term Exams
The students will gain practical knowledge by visiting wildlife areas, environmental institutes and various personalities who	√	√	√	√	√						√	√	Understanding & Applying	Yes	Minor Exams, Assignments, End Term Exams
The students will apply interdisciplinary approach to understand key environmental issues and critically analyze them to	√	√	√	√	√						√	√	Understanding & Applying	Yes	Minor Exams, Assignments, End Term Exams

Course Outcome	PO 1 (Engineering Knowledge)	PO 2 (Problem Analysis)	PO 3 (Design/Development)	PO 4 (Conduct)	PO 5 (Modern Tool usage)	PO 6 (The Engineer and Society)	PO 7 (Environment and)	PO 8 (Ethics)	PO 9 (Individual and Team)	PO 10 (Communication)	PO 11 (Project Management)	PO 12 (Life long Learning)	Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO
Reflect critically about their roles and identities as citizens, consumers and environmental actors in a complex, interconnected	√	√	√	√	√							√	Understanding & Applying	Yes	Minor Exams, Assignments, End Term Exams

BTME406-18 APPLIED THERMODYNAMICS Lab

Course Outcome	PO 1 (Engineering Knowledge)	PO 2 (Problem Analysis)	PO 3 (Design/Development)	PO 4 (Conduct)	PO 5 (Modern Tool usage)	PO 6 (The Engineer and Society)	PO 7 (Environment and)	PO 8 (Ethics)	PO 9 (Individual and Team)	PO 10 (Communication)	PO 11 (Project Management)	PO 12 (Life long Learning)	Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1: Explain the functioning and performance evaluation of reciprocating air compressors.	√		√	√	√	√	√		√	√		√	Understanding, Applying and Designing	Yes	Minor Exams, Assignments, End Term Exams
CO 2: Analyze the combustion phenomenon in boilers and I.C. engines.	√	√		√	√	√	√	√	√	√	√	√	Understanding, Applying	Yes	Minor Exams, Assignments, End Term Exams
CO 3: Use of Steam Tables and MollierChart to solve vapour power cycle problems.	√	√	√	√	√	√	√	√	√	√	√	√	Understanding, Applying	Yes	Minor Exams, Assignments, End Term Exams
CO 4: Demostrate the constructional features and working of steam power plants and to evaluate their performance.	√	√	√	√	√	√	√		√	√	√	√	Understanding, Applying	Yes	Minor Exams, Assignments, End Term Exams

Paper BTME407-18 Fluid Machines Lab

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1: Conduct experiments on scaled down models or on actual size hydraulic machines and evaluate results in terms of unit or	√	√	√		√	√	√		√	√	√	√	Applying	Yes	Case Study, Group Discussions etc.
CO 2: Understand the working of various hydraulic machines (turbines and pumps) and can suggest remedial solutions for various	√	√	√		√	√	√		√	√	√	√	Understanding	Yes	Case Study, Group Discussions etc.

Paper BTME408-18 Material Engineering Lab

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO
Analyse the microstructure of different ferrous and non-ferrous samples.	√	√	√		√	√	√		√	√	√	√	Applying	Yes	Case Study, Group Discussions etc.

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	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO
Explore the effect of heat treatment on various engineering materials by analysing its microstructure and hardness	√	√	√		√	√	√		√	√	√	√	Understanding	Yes	Case Study, Group Discussions etc.

BMPD401-18 Mentoring and professional Development

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1: The student will be able to effectively communicate and present technical material.	√	√	√		√		√	√	√	√	√	√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
CO2: Ability to think critically and creatively to generate innovative and optimum solutions.		√	√		√		√	√	√	√	√	√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
CO3:The student will be able to identify, evaluate and synthesise information from a range of sources to optimise process engineering design		√	√		√		√	√	√	√	√	√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
CO4: Engage in continuous education, training and research, and take control of their own learning and overall development.		√	√		√		√	√		√		√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams

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BTME501-18 Heat Transfer

Course Outcome	PO 1 (Engineering Knowledge)	PO 2 (Problem Analysis)	PO 3 (Design/Development)	PO 4 (Conduct)	PO 5 (Modern Tool usage)	PO 6 (The Engineer and Society)	PO 7 (Environment and)	PO 8 (Ethics)	PO 9 (Individual and Team)	PO 10 (Communication)	PO 11 (Project Management)	PO 12 (Life long Learning)	Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO
To teach students the basic principles of conduction, radiation, and convection heat transfer. Students will demonstrate an	√		√	√	√	√	√		√	√		√	Understanding, Applying and Designing	Yes	Minor Exams, Assignments, End Term Exams
To extend the basic principle of conservation of energy to systems that involve conduction, radiation, and heat transfer. Students will	√	√		√	√	√	√	√	√	√	√	√	Understanding, Applying	Yes	Minor Exams, Assignments, End Term Exams
To train students to identify, formulate, and solve engineering problems involving conduction heat transfer. Students will	√	√	√	√	√	√	√	√	√	√	√	√	Understanding, Applying	Yes	Minor Exams, Assignments, End Term Exams
To train students to identify, formulate, and solve engineering problems involving forced convection heat transfer, natural	√	√	√	√	√	√	√		√	√	√	√	Understanding, Applying	Yes	Minor Exams, Assignments, End Term Exams
To train students to identify, formulate, and solve engineering problems involving radiation heat transfer among black	√	√	√	√	√	√	√		√	√	√	√	Understanding, Applying	Yes	Minor Exams, Assignments, End Term Exams

BTME502-18 : Design of Machine Elements

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1: Demonstrate recalling and applying knowledge of Basic Sciences, Graphics & Drawing, Basic Manufacturing Processes and Material	√	√	√	√	√	√				√	√	√	Understanding, Applying and Designing	Yes	Minor Exams, Assignments, End Term Exams
CO2: Comprehend the effect of different stresses and strains under various loading conditions on the mechanical components and identify the	√	√	√	√	√	√				√	√	√	Understanding and Applying	Yes	Minor Exams, Assignments, End Term Exams
CO3: Examine and solve design problems involving machine elements on the basis of various theories of failure.	√	√	V	√	√	√				√	√	√	Applying and Designing	Yes	Minor Exams, Assignments, End Term Exams
CO4: Synergize forces, moments and strength information to develop ability to analyze, design and/or select machine elements	√	√	√	√	√	√	√			√	√	√	Understanding, Applying and Designing	Yes	Minor Exams, Assignments, End Term Exams

Paper BTME 503-18 Manufacturing Processes

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Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1: Understand the different conventional manufacturing methods employed for making different products.	√	√	√		√	√	√			√	√	√	Understandi ng	Yes	Minor Exams, Quiz, Assignments, End Term Exams
CO 2: Understand the different unconventional manufacturing methods employed for making different products.	√	√	√		√	√	√			√	√	√	Understandi ng	Yes	Minor Exams, Quiz, Assignments, End Term Exams

Paper BTME 503-18 Management & Engineering Economics

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1: Explain the development of management and the role it plays at different levels in an organization.	√						√	√	√	√	√	√	Understandi ng	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
CO 2: Comprehend the process and role of effective planning, organizing and staffing for the development of an organization.							√	√	√	√	√	√	Understandi ng	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO
CO 3: Understand the necessity of good leadership, communication and coordination for establishing effective control in an							√	√	√	√	√	√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
CO 4: Understand engineering economics demand supply and its importance in economics decision making and problem							√	√		√		√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
CO 5: Calculate present worth, annual worth and IRR for different alternatives in economic decision making.	√	√	√	√	√	√	√	√	√	√	√	√	Applying	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
CO 6: Understand the procedure involved in estimation of cost for a simple component, product costing and depreciation, its	√	√	√	√	√	√	√	√	√	√	√	√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams

Paper BTME 503-18 Heat Transfer Lab

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO
Design and fabricate the experimental setups related to heat transfer phenomena.	√	√	√		√	√	√			√	√	√	Understanding	Yes	Minor Exams, Quiz, Assignments, End Term Exams

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Measure and analyse different heat transfer parameters.	√	√	√		√	√	√			√	√	√	Understanding	Yes	Minor Exams, Quiz, Assignments, End Term Exams

Paper BTME 506-18 Manufacturing Processes Laboratory

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1: Determine/calculate the clay content, moisture content, hardness, permeability and grain fineness number of moulding	√	√	√	√	√	√	√			√	√	√	Applying	Yes	Minor Exams, Buisness Quiz, End Term Exams
CO 2: Use oxy-acetylene gas welding, manual arc welding, MIG, TIG and spot-welding processes to make various joints.	√	√	√	√	√	√	√			√	√	√	Applying	Yes	Minor Exams, Buisness Quiz, End Term Exams
CO 3: Use machine tools such as lathe, shaper and milling machine for machining/cutting various profiles on work pieces.	√	√	√	√	√	√	√			√	√	√	Applying	Yes	Minor Exams, Buisness Quiz, End Term Exams
CO 4: Learn about the constructional features and working of grinding machines, hydraulic press, draw bench, rolling mills,	√	√	√	√	√	√	√			√	√	√	Applying	Yes	Minor Exams, Buisness Quiz, End Term Exams

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Paper BTME 507-18 Numerical Methods Lab

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO
Understand different implementation modes of numerical methods.	√	√	√	√	√	√	√			√	√	√	Applying	Yes	Minor Exams, Buisness Quiz, End Term Exams
Use the numerical methods with the understanding of limitations of these methods for solving problems.	√	√	√	√	√	√	√			√	√	√	Applying	Yes	Minor Exams, Buisness Quiz, End Term Exams
Develop and implement their own computer programs.	√	√	√	√	√	√	√			√	√	√	Applying	Yes	Minor Exams, Buisness Quiz, End Term Exams
Solve problems more accurately and efficiently in low computational time.	√	√	√	√	√	√	√			√	√	√	Applying	Yes	Minor Exams, Buisness Quiz, End Term Exams
Handle the problems conveniently which are difficult to deal with manually	√	√	√	√	√	√	√			√	√	√	Applying	Yes	Minor Exams, Buisness Quiz, End Term Exams

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Paper BTMC102-18 ESSENCE OF INDIAN KNOWLEDGE TRADITION

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO
Understand the Philosophy of Indian Knowledge system and and its Basic Structure.	√	√	√	√	√	√	√			√	√	√	Applying	Yes	Minor Exams, Buisness Quiz, End Term Exams
Understand the Ancient India Culture, Society and Religion.	√	√	√	√	√	√	√			√	√	√	Applying	Yes	Minor Exams, Buisness Quiz, End Term Exams
Examine the areas of Indian Linguistic Tradition.	√	√	√	√	√	√	√			√	√	√	Applying	Yes	Minor Exams, Buisness Quiz, End Term Exams
Know the contrubtion of scientits of different eras.	√	√	√	√	√	√	√			√	√	√	Applying	Yes	Minor Exams, Buisness Quiz, End Term Exams
Handle the problems conveniently which are difficult to deal with manually	√	√	√	√	√	√	√			√	√	√	Applying	Yes	Minor Exams, Buisness Quiz, End Term Exams

Paper BTME 409-18 4 weeks industrial training

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO
Capability to acquire and apply fundamental principles of engineering.	√	√	√	√	√	√	√			√	√	√	Applying	Yes	Minor Exams, Buisness Quiz, End Term Exams
Become master in one's specialized technology	√	√	√	√	√	√	√			√	√	√	Applying	Yes	Minor Exams, Buisness Quiz, End Term Exams
Become updated with all the latest changes in technological world.	√	√	√	√	√	√	√			√	√	√	Applying	Yes	Minor Exams, Buisness Quiz, End Term Exams
Ability to communicate efficiently.	√	√	√	√	√	√	√			√	√	√	Applying	Yes	Minor Exams, Buisness Quiz, End Term Exams
Knack to be a multi-skilled engineer with good technical knowledge, management, leadership and entrepreneurship skills.	√	√	√	√	√	√	√			√	√	√	Applying	Yes	Minor Exams, Buisness Quiz, End Term Exams

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO
Ability to identify, formulate and model problems and find engineering solution based on a systems approach.	√	√	√	√	√	√	√		√	√	√		Applying	Yes	Minor Exams, Buisness Quiz, End Term Exams
Capability and enthusiasm for self-improvement through continuous professional development and life-long learning	√	√	√	√	√	√	√		√	√	√		Applying	Yes	Minor Exams, Buisness Quiz, End Term Exams
Awareness of the social, cultural, global and environmental responsibility as an engineer.	√	√	√	√	√	√	√		√	√	√		Applying	Yes	Minor Exams, Buisness Quiz, End Term Exams

BTME601-18 REFREGERATION AND AIR CONDITIONING

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1: Understand the fundamental principles and applications of refrigeration and air conditioning system	√	√	√	√	√		√	√	√	√	√	√	Understandi ng	Yes	Minor Exams, Assignments, End Term Exams
CO2: The students will be able to obtain cooling capacity and coefficient of performance by conducting test on refrigeration systems	√	√	√	√	√		√		√		√	√	Applying and Designing	Yes	Minor Exams, Assignments, End Term Exams

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO
CO3: The students will develop ability to calculate the energy requirements of cooling and heat equipment for air conditioning	√		√	√	√	√	√		√	√	√	√	Applying and Designing	Yes	Minor Exams, Assignments, End Term Exams
CO4: The students will be able to Explain the properties, applications and enironmental issues of different refrigerants.	√	√		√	√	√		√	√	√		√	Applying and Designing	Yes	Minor Exams, Assignments, End Term Exams
CO5: The students can demonstrate an ability to analysis psychrometric processes and cycles of air conditioning systems.	√	√	√	√	√		√		√	√	√	√	Applying and Designing	Yes	Minor Exams, Assignments, End Term Exams

Paper BTME602-18 Mechanical Measurements & Metrology
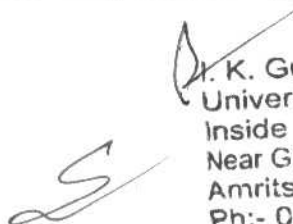
Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1: To provide a knowledge about measurement systems and their components	√	√	√	√	√	√			√	√	√	√	Knowledge	Yes	Lectures, Tutorials, Assignments, Powerpoint Presentations, Numericals etc.
CO 2: To learn about various sensors and transducers used for measurement of mechanical quantities	√	√	√	√	√	√			√	√	√	√	Understanding	Yes	Lectures, Tutorials, Assignments, Powerpoint Presentations, Numericals etc.

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CO 3: To learn about usage of various measuring instruments.	√	√	√	√	√	√			√	√	√	√	Understanding	Yes	Lectures, Tutorials, Assignments, Powerpoint Presentations, Numericals etc.
CO 4: To learn metrology of screw, gear and surface texture.	√	√	√	√	√	√			√	√	√	√	Understanding	Yes	Lectures, Tutorials, Assignments, Powerpoint Presentations, Numericals etc.

BTME603-18 AUTOMOBILE ENGINEERING

Course Outcome	PO 1 (Engineering Knowledge)	PO 2 (Problem Analysis)	PO 3 (Design/Development)	PO 4 (Conduct)	PO 5 (Modern Tool usage)	PO 6 (The Engineer and Society)	PO 7 (Environment and)	PO 8 (Ethics)	PO 9 (Individual and Team)	PO 10 (Communication)	PO 11 (Project Management)	PO 12 (Life long Learning)	Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1: Identify the different parts of the automobile.	√		√	√	√	√	√		√	√	√	√	Understanding, Applying and Designing	Yes	Minor Exams, Assignments, End Term Exams
CO 2: Demostrate the working of various parts like engine, transmission, clutch, brakes, steering and the suspension systems.	√		√	√	√	√	√	√	√	√	√	√	Understanding, Applying	Yes	Minor Exams, Assignments, End Term Exams
CO 3: Explain the need of vehicle safety systems and future developments in the automobile industry.	√	√	√	√	√	√	√	√	√	√	√	√	Understanding, Applying	Yes	Minor Exams, Assignments, End Term Exams

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Paper BTME 604-18 Introduction to Industrial Management

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1: 1.Understand the complexities associated with management in the organizations and integrate the learning in handling these	√	√	√		√	√	√	√	√	√	√	√	Understanding	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
CO 2: 2.Demonstrate the roles, skills and functions of management.	√	√	√		√	√	√	√	√	√	√	√	Applying	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams
CO 3: 3.Understand the concepts related to industrial management.	√	√	√	√		√	√	√	√	√	√	√	Applying	Yes	Minor Exams, Buisness Quiz, Assignments,End Term Exams

BTME605-18 REFREGERATION AND AIR CONDITIONING LAB

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1: Understand the fundamental principles and applications of refrigeration and air conditioning system	√	√	√	√	√		√	√	√	√	√	√	Understanding	Yes	Minor Exams, Assignments, End Term Exams
CO2: The students will be able to obtain cooling capacity and coefficient of performance by conducting test on refrigeration systems	√	√	√	√	√		√		√		√	√	Applying and Designing	Yes	Minor Exams, Assignments, End Term Exams
CO3: The students will develop ability to calculate the energy requirements of cooling and heat equipment for air conditioning	√		√	√	√	√	√		√	√	√	√	Applying and Designing	Yes	Minor Exams, Assignments, End Term Exams
CO4: The students will be able to Explain the properties, applications and enironmental issues of different refrigerants.	√	√		√	√	√		√	√	√		√	Applying and Designing	Yes	Minor Exams, Assignments, End Term Exams
CO5: The students can demonstrate an ability to analysis psychrometric processes and cycles of air conditioning systems.	√	√	√	√	√		√		√	√	√	√	Applying and Designing	Yes	Minor Exams, Assignments, End Term Exams

Paper BTME606-18 Mechanical Measurements & Metrology Lab

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1: Demonstrate the use of instruments for measuring linear (internal and external), angular dimensions and surface roughness.	√	√	√	√	√	√			√	√	√	√	Understanding	Yes	Case Study, Group Discussions, etc
CO 2: Identify proper measuring instrument and know requirement of calibration, errors in measurement etc.	√	√	√	√	√	√			√	√	√	√	Knowledge	Yes	Case Study, Group Discussions, etc
CO 3: Apply analytical and experimental methods to make measurements and to find and correct defects in measurement systems.	√	√	√	√	√	√			√	√	√	√	Applying	Yes	Case Study, Group Discussions, etc

BTME603-18 AUTOMOBILE ENGINEERING LAB

Course Outcome	PO 1 (Engineering Knowledge)	PO 2 (Problem Analysis)	PO 3 (Design/Devel opm	PO 4 (Conduct)	PO 5 (Modern Tool usage	PO 6 (The Engineer and Societ	PO 7 (Environment and	PO 8 (Ethics)	PO 9 (Individual and Team	PO 10 (Communication)	PO 11 (Project Management	PO 12 (Life long Learning)	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1: Identify the different parts of the automobile.	√		√	√	√	√	√		√	√	√	√	Understanding, Applying and Designing	Yes	Minor Exams, Assignments, End Term Exams
CO 2: Demonstrate the working of various parts like engine, transmission, clutch, brakes, steering and the suspension systems.	√		√	√	√	√	√	√	√	√	√	√	Understanding, Applying	Yes	Minor Exams, Assignments, End Term Exams

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CO 3: Explain the need of vehicle safety systems and future developments in the automobile industry.	√	√	√	√	√	√	√	√	√	√	√	√	Understanding, Applying	Yes	Minor Exams, Assignments, End Term Exams

BTME—608-18 : Minor Project

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1:Identify an open ended problem in area of mechanical engineering which requires further investigation.	√		√		√	√	√	√	√	√	√	√	Understanding	Yes	Reports, Project Presentations and Final Viva
CO2: Identify the methods and materials required for the project work.	√	√	√	√	√	√	√	√	√	√	√	√	Applying and Designing	Yes	Reports, Project Presentations and Final Viva
CO3: Manage the work with team members.	√		√	√	√	√	√	√	√	√	√	√	Applying and Designing	Yes	Reports, Project Presentations and Final Viva
CO4: . Formulate and implement innovative ideas for social and environmental benefits.	√	√	√	√	√	√	√	√	√	√	√	√	Applying and Designing	Yes	Reports, Project Presentations and Final Viva

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO
CO5: Write technical report of the project apart from developing a presentation.	√	√	√	√	√	√	√		√	√	√	√	Applying and Designing	Yes	Reports, Project Presentations and Final Viva

Paper: Internal Combustion Engines 609-18

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1:Knowledge about the basics of IC engines	√	√	√	√			√		√	√		√	Understanding	Yes	Minor Exams, Quiz, demonstrations through videos/ lab, End Term Exams
CO2:Ability to evaluate operational characteristics of IC Engines	√	√	√	√		√	√		√	√	√	√	Understanding	Yes	Minor Exams, Quiz, demonstrations through videos/ lab, End Term Exams
CO3:Ability to ascertain the effects of fuel/supply systems on emission from an engine.		√	√	√	√		√				√	√	Understanding	Yes	Minor Exams, Quiz, demonstrations through videos/ lab, End Term Exams
CO4:Ability to test engine performance		√	√	√	√		√	√		√		√	Applying		

BTME-610-18 Mechatronics Systems

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1: Design mux, demux, flip-flops, and shift registers.		√	√	√	√		√	√	√	√	√		Applying and Designing	Yes	Minor Exams, Assignments, End Term Exams
CO2:Describe the block diagram, registers, ALU, bus systems, timing & control signals, instruction cycles, and interrupts of 8085	√	√			√		√	√	√	√	√	√	Applying and Designing	Yes	Minor Exams, Assignments, End Term Exams
CO3: Apply the concept of 8085 microprocessor instruction sets and addressing modes in writing assembly language program	√	√	√		√	√	√	√	√	√	√		Applying and Designing	Yes	Minor Exams, Assignments, End Term Exams
CO4: Describe the interfacing of memory, 8255 PPI, ADC, DAC, 7-segment LED system, stepper motor, 8251 and 8253 ICs with 8085	√		√	√	√		√			√		√	Applying and Designing	Yes	Minor Exams, Assignments, End Term Exams

BTME-611-18 Microprocessor in automation

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO
Student is able to describe the architecture and different modes of operations of a typical microprocessor.		√	√	√	√		√	√	√	√	√		Applying and Designing	Yes	Minor Exams, Assignments, End Term Exams
Student is able to understand different addressing modes and instructions of 8086 design and develop assembly	√	√			√		√	√	√	√	√	√	Applying and Designing	Yes	Minor Exams, Assignments, End Term Exams
Student is able to interface memory, I/O devises and interrupt controller with 8086 microprocessors.	√	√	√		√	√	√	√	√	√	√		Applying and Designing	Yes	Minor Exams, Assignments, End Term Exams
Student is able to describe the internal architecture and different modes of operations of a typical microcontroller	√		√	√	√		√			√		√	Applying and Designing	Yes	Minor Exams, Assignments, End Term Exams
Student is able to design and develop assembly language programs using 8051 microcontroller	√		√	√	√		√			√		√	Applying and Designing	Yes	Minor Exams, Assignments, End Term Exams
CS 305.6 Student is able to analyze and compare the features of microprocessors and microcontrollers.	√		√	√	√		√			√		√	Applying and Designing	Yes	Minor Exams, Assignments, End Term Exams

BTME612-18 COMPOSITE MATERIALS

Course Outcome	PO 1 (Engin eering Knowle dge)	PO 2 (Probl em Analy sis)	PO 3 (Desi gn/D evel opm	PO 4 (Cond uct)	PO 5 (Mode rn Tool usage	PO 6 (The Engine er and Societ	PO 7 (Envir onme nt and	PO 8 (Et hic s)	PO 9 (Indi vidua l and Team	PO 10 (Comm unicati on)	PO 11 (Proje ct Manag ement	PO 12 (Life long Learnin g)	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1: Explain the concept, need and applications of composite materials.	√	√	√	√	√	√	√		√	√		√	Understandi ng, Applying and Designing	Yes	Minor Exams, Assignments, End Term Exams
CO 2: Suggest/select optimum combination of Matrix/Reinforcement for various engineering applications.	√	√	√	√	√	√	√	√	√	√	√	√	Understandi ng, Applying	Yes	Minor Exams, Assignments, End Term Exams
CO 3: Analyze the effects of influencing factors on the strength of composite materials.	√	√	√	√	√	√	√		√		√	√	Understandi ng, Applying	Yes	Minor Exams, Assignments, End Term Exams

BTME-613-18 Computer Aided Design

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1: Create the different wireframe primitives using parametric representations	√	√	√		√		√	√		√	√		Applying and Designing	Yes	Minor Exams, Assignments, End Term Exams
CO2: Create surface primitives using parametric modeling.		√		√	√		√	√	√		√	√	Applying and Designing	Yes	Minor Exams, Assignments, End Term Exams
CO3: Create the different solid primitives using the different representation schemes	√		√	√	√		√	√	√	√	√		Applying and Designing	Yes	Minor Exams, Assignments, End Term Exams
CO4: Apply geometric transformations on the created wireframe, surface and solid models.	√	√	√		√	√	√		√	√		√	Applying and Designing	Yes	Minor Exams, Assignments, End Term Exams

Paper BTME 614-18 Product Design & Development

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1: Understand desirable design aspects considering various production processes and also understand the economic factors of design.	√	√	√	√	√	√	√	√	√	√	√	√	Understanding	Yes	Minor Exams, Quiz, Assignments, End Term Exams

Course Outcome	PO 1	PO 2	PO3	PO 4	PO 5	PO 6	PO7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO
CO 2: Employ engineering, scientific, and mathematical principles to execute a design from concept to finished product.	√	√	√	√	√	√	√	√	√	√	√	√	Applying	Yes	Minor Exams, Quiz, Assignments, End Term Exams
CO 3: Apply the modern approaches to product design considering concurrent design, quality function deployment and various rapid	√	√	√	√	√	√	√	√	√	√	√	√	Applying	Yes	Minor Exams, Quiz, Assignments, End Term Exams
CO 4: Apply innovative process techniques in synthesizing information, problem-solving and critical thinking.	√	√	√	√	√	√	√	√	√	√	√	√	Applying	Yes	Minor Exams, Quiz, Assignments, End Term Exams

BTME 615-18 : Non Conventional Energy Resources

Course Outcome	PO 1	PO 2	PO3	PO 4	PO 5	PO 6	PO7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1: To Explain renewable energy sources & systems.	√	√				√						√	Understanding	Yes	Minor Exams, Buisness Quiz, End Term Exams
CO2: To Apply engineering techniques to build solar, wind, tidal, geothermal, biofuel, fuel cell, Hydrogen and sterling engine	√	√	√	√	√	√	√	√	√		√		Designing	Yes	Minor Exams, Buisness Quiz, End Term Exams

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Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO
CO3: To Analyze and evaluate the implication of renewable energy. Concepts in solving numerical problems pertaining to solar radiation	√	√	√	√	√	√	√				√		Applying	Yes	Minor Exams, Buisness Quiz, End Term Exams
CO4: To Demonstrate self - learning capability to design & establish renewable energy systems.	√	√	√	√	√	√	√	√	√		√	√	Applying	Yes	Minor Exams, Buisness Quiz, End Term Exams
CO5: To Conduct experiments to assess the performance of solar PV, solar thermal and biodiesel systems	√	√	√	√	√	√	√	√	√		√	√	Applying	Yes	Minor Exams, Buisness Quiz, End Term Exams

BTME616-18 : OPERATION RESEARCH

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1: Explain various mathematical deterministic operation research models.	√	√	√	√	√			√	√	√	√	√	Understanding, Applying	Yes	Minor Exams, Class and Home Assignments, End Term Exams
CO2: Describe the problems of probabilistic and simulation models.	√	√	√	√	√			√	√	√	√	√	Understanding, Applying	Yes	Minor Exams, Class and Home Assignments, End Term Exams

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Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO
CO3: Demonstrate the queuing, inventory and replacement models etc.	√	√	√	√	√			√	√	√	√	√	Applying and Designing	Yes	Minor Exams, Class and Home Assignments, End Term Exams
CO4: Formulate and analyze the network models.	√	√	√	√	√			√	√	√	√	√	Applying and Designing	Yes	Minor Exams, Class and Home Assignments, End Term Exams

BTME617-18: MAINTENANCE & RELIABILITY

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1: Understand the concepts of reliability and maintainability	√	√	√	√	√	√	√	√	√	√	√	√	Understanding	Yes	Minor Exams, Assignments, End Term Exams
CO2: The students will be able to use statistical tools to characterise the reliability of an item and determine the reliability of a system, and	√	√	√	√	√	√	√	√	√	√	√	√	Applying and Designing	Yes	Minor Exams, Assignments, End Term Exams
CO3: The students will develop ability in formulating suitable maintenance strategies to enhance system reliability of a manufacturing	√	√	√	√	√	√	√	√	√	√	√	√	Applying and Designing	Yes	Minor Exams, Assignments, End Term Exams

Paper BTME701-18 Mechanical Vibrations

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1: Formulate mathematical models of problems in vibrations using Newton's second law or energy	√	√	√	√	√	√	√		√	√	√	√	Understanding	Yes	Lectures, Tutorials, Assignments, Powerpoint Presentations, Numericals etc.
CO 2: Understand the need and measurement of vibration in mechanical systems.	√	√	√	√	√	√	√		√	√	√	√	Understanding	Yes	Lectures, Tutorials, Assignments, Powerpoint Presentations, Numericals etc.
CO 3: Calculate principal modes of vibration.	√	√	√	√	√	√	√		√	√	√	√	Applying	Yes	Lectures, Tutorials, Assignments, Powerpoint Presentations, Numericals etc.
CO4: Explore the suitable methods of vibration reduction and absorption.	√	√	√	√	√	√	√		√	√	√	√	Applying	Yes	Lectures, Tutorials, Assignments, Powerpoint Presentations, Numericals etc.
CO5: Ability to determine vibratory responses of SDOF and MDOF systems.	√	√	√	√	√	√	√		√	√	√	√	Analyse	Yes	Lectures, Tutorials, Assignments, Powerpoint Presentations, Numericals etc.

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO
CO6: Ability to determine vibratory responses of SDOF and MDOF systems.	√	√	√	√	√	√	√		√	√	√	√	Analyse	Yes	Lectures, Tutorials, Assignments, Powerpoint Presentations, Numericals etc.

Paper BTME702-18 Automation in manufacturing

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO9	PO10	PO11	PO12	Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO
Illustrate the basic concepts of automation in machine tools.															
Analyze various automated flow lines, Explain assembly systems and line balancing methods.	√	√	√	√	√	√	√		√	√	√	√	Applying	Yes	Lectures, Tutorials, Assignments, Powerpoint Presentations, Numericals etc.
Describe the importance of automated material handling and storage systems.	√	√	√	√	√	√	√		√	√	√	√	Understanding	Yes	Lectures, Tutorials, Assignments, Powerpoint Presentations, Numericals etc.
Interpret the importance of adaptive control systems, automated inspection systems.	√	√	√	√	√	√	√		√	√	√	√	Applying	Yes	Lectures, Tutorials, Assignments, Powerpoint Presentations, Numericals etc.

BTME703-18 Fundamentals of Management for Engineers

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1: The students understand the significance of Management in their Profession	√					√		√	√	√	√	√	Understanding	Yes	Minor Exams, Assignments, End Term Exams
CO2: The various Management Functions like Planning, Organizing, Staffing, Leading, aspects are learnt in this course	√			√	√	√		√	√	√	√	√	Understanding, Applying	Yes	Minor Exams, Assignments, End Term Exams
CO3: Understand the complexities associated with management in the organizations and integrate the learning in handling these	√	√	√	√	√	√		√	√	√	√	√	Understanding, Applying	Yes	Minor Exams, Assignments, End Term Exams
CO4: Demonstrate the roles, skills and functions of management.	√			√	√	√		√	√	√	√	√	Applying	Yes	Minor Exams, Assignments, End Term Exams

BTME-704-18 : Project-II

Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employ ability / Entrepr	Assessment Tools to Measure Attainment of CO
CO1: To create an Industrial environment and culture within the institution.	√		√		√	√	√	√	√	√	√	√	Understanding	Yes	Reports, Project Presentations and Final Viva
CO2: To set up production lab utilizing the infrastructure of the institution.	√	√	√		√	√	√	√	√	√	√	√	Applying and Designing	Yes	Reports, Project Presentations and Final Viva
CO3: To standardize laboratories to industrial standard, thereby giving exposure to industrial housekeeping standards.	√	√	√		√	√	√	√	√	√	√	√	Applying and Designing	Yes	Reports, Project Presentations and Final Viva
CO4: Demonstrate an ability to present and defend their research work to a panel of experts.	√		√	√	√	√	√	√	√	√	√	√	Applying and Designing	Yes	Reports, Project Presentations and Final Viva
CO5: Demonstrate knowledge of contemporary issues in their chosen field of research.	√	√	√	√	√	√	√		√	√	√	√	Applying and Designing	Yes	Reports, Project Presentations and Final Viva

BTME-801 Software/Industrial Training

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Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PO 9	PO 10	PO 11	PO 12	Skill	Focus on Employability / Entrepr	Assessment Tools to Measure Attainment of CO
Capability to acquire and apply fundamental principles of engineering.	√		√		√	√	√	√	√	√	√	√	Understanding	Yes	Reports, Project Presentations and Final Viva
Become master in one's specialized technology	√	√	√		√	√	√	√	√	√		√	Applying and Designing	Yes	Reports, Project Presentations and Final Viva
Become updated with all the latest changes in technological world.	√	√	√		√	√	√	√	√	√	√	√	Applying and Designing	Yes	Reports, Project Presentations and Final Viva
Ability to communicate efficiently.	√		√	√	√	√	√	√	√	√	√	√	Applying and Designing	Yes	Reports, Project Presentations and Final Viva
Knack to be a multi-skilled engineer with good technical knowledge, management, leadership and entrepreneurship skills.	√	√	√	√	√	√	√		√	√	√	√	Applying and Designing	Yes	Reports, Project Presentations and Final Viva
Ability to identify, formulate and model problems and find engineering solution based on a systems approach.	√	√	√	√	√	√	√		√	√	√	√	Applying and Designing	Yes	Reports, Project Presentations and Final Viva

Capability and enthusiasm for self-improvement through continuous professional development and life-long learning	√	√	√	√	√	√	√		√	√	√	√	Applying and Designing	Yes	Reports, Project Presentations and Final Viva
Awareness of the social, cultural, global and environmental responsibility as an engineer	√	√	√	√	√	√	√		√	√	√	√	Applying and Designing	Yes	Reports, Project Presentations and Final Viva

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Department Computer Science and Engineering
Program : B.Tech. (Computer Science and Engineering)
BTCS(type code) : BTCS BTCS606-18UC (Network Security and Cryptography)

CO No.	CO Statement	PO-a Engineering Knowledge	PO-b Problem Analysis	PO-c Design/development of solutions	PO-d Conduct investigations of complex problems	PO-e Modern tool usage	PO-f The engineer and society	PO-g Environment and sustainability	PO-h Ethics	PO-i Individual and team work	PO-j Communication	PO-k Project management and finance	PO-l Life-long Learning	PSO-m Honing Domain Knowledge	PSO-n Innovation and design	PSO-o Entrepreneurship Skills	PSO-p Ethical values	Learning	Focus on	Assessment Tools to Measure Attainment of CO
CO1		3	3	2	2	3	3	2	1	2	3		2	3	3	2	1	2	3	MSTs, ESE, Class/Quiz Tests
CO2		3	1	3	3	3	3	3	1	2	3		3	3	2	2	1	2	3	MSTs, ESE, Class/Quiz Tests
CO3		3	2	3	3	3	3	3	1	2	3	1	3	3	3	2	1	2	3	MSTs, ESE, Class/Quiz Tests
CO4		3		3	3	3	3	3	1	2	3		3	3	2	2	1	3	3	MSTs, ESE, Class/Quiz Tests

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Department Computer Science and Engineering

Program : B.Tech. (Computer Science and Engineering)

BTCS(type code) : BTCS BTCS609-18UC (Network Security and Cryptography Lab) (CO's of Network Security and Cryptography Lab is not provided in 2018 Syllabus)

CO No.	CO State	PO-a Engineering Knowledge	PO-b Problem Analysis	PO-c Design/development of solutions	PO-d Conduct investigations of complex problems	PO-e Modern tool usage	PO-f The engineer and society	PO-g Environment and sustainability	PO-h Ethics	PO-I Individual and team work	PO-j Communication	PO-k Project management and finance	PO-l Life-long Learning	PSO-m Honing Domain Knowledge	PSO-n Innovation and design	PSO-o Entrepreneurship Skills	PSO-p Ethical values	Learning	Focus on	Assessment Tools to Measure Attainment of CO
CO1		3	3	2	2	3	3	2	1	2	3		2	3	3	2	1	2	3	MSTs, ESE, Class/Quiz Tests
CO2		3	1	3	3	3	3	3	1	2	3		3	3	2	2	1	2	3	MSTs, ESE, Class/Quiz Tests
CO3		3	2	3	3	3	3	3	1	2	3	1	3	3	3	2	1	2	3	MSTs, ESE, Class/Quiz Tests
CO4		3		3	3	3	3	3	1	2	3		3	3	2	2	1	3	3	MSTs, ESE, Class/Quiz Tests

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Department Computer Science and Engineering
Program : B.Tech. (Computer Science and Engineering)
BTCS(type code) : BTCS BTCS609-18UC (Network Security and Cryptography Lab)   (CO's of Network Security and Cryptography Lab is not provided in 2018 Syllabus)

CO No.	CO State	PO-a Engineering Knowledge	PO-b Problem Analysis	PO-c Design/development of solutions	PO-d Conduct investigations of complex problems	PO-e Modern tool usage	PO-f The engineer and society	PO-g Environment and sustainability	PO-h Ethics	PO-i Individual and team work	PO-j Communication	PO-k Project management and finance	PO-l Life-long Learning	PSO-m Honing Domain Knowledge	PSO-n Innovation and design	PSO-o Entrepreneurship Skills	PSO-p Ethical values	Learning	Focus on	Assessment Tools to Measure Attainment of CO
CO1		3	3	2	2	3	3	2	1	2	3		2	3	3	2	1	2	3	MSTs, ESE, Class/Quiz Tests
CO2		3	1	3	3	3	3	3	1	2	3		3	3	2	2	1	2	3	MSTs, ESE, Class/Quiz Tests
CO3		3	2	3	3	3	3	3	1	2	3	1	3	3	3	2	1	2	3	MSTs, ESE, Class/Quiz Tests
CO4		3		3	3	3	3	3	1	2	3		3	3	2	2	1	3	3	MSTs, ESE, Class/Quiz Tests

Department Computer Science and Engineering
Program : B.Tech. (Computer Science and Engineering)
BTCS : (Data minng Lab)

CO No.	CO State	PO-a (Engineering Knowledge)	PO-b (Problem Analysis)	PO-c (Design/development of solutions)	PO-d (Conduct investigations of complex problems)	PO-e (Modern tool usage)	PO-f (The engineer and society)	PO-g (Environment and sustainability)	PO-h (Ethics)	PO-i (Individual and team work)	PO-j (Communication)	PO-k (Project management and finance)	PO-l (Life-long Learning)	PSO-m (Honing Domain Knowledge)	PSO-n (Innovation and design)	PSO-o (Entrepreneurship Skills)	PSO-p (Ethical values)	Learning	Focus on	Assessment Tools to Measure Attainment of CO
CO1	Apply data cl	3		3	3	3				2				3		2		Apply	Employab	
CO2	Execute algorit	3	3	3	3	3	3			2				3		2		Design	Employab	
CO3	Extract know	3	3	3	3	3	3		1	2				3			1	Apply	Employab	MSTs, ESE, Class/Quiz Tests
CO4	Explore recen	3	2	3	3	3				2		1		3	2			Design	Employab	

Department Computer Science and Engineering
Program : B.Tech. (Computer Science and Engineering)
BTCS(type code) : BTCS-612-18 Cloud Computing Lab

CO No.	CO State	Engineering Knowledge PO-a	Problem Analysis PO-b	Design/development of solutions PO-c	Conduct investigations of complex problems PO-d	Modern tool usage PO-e	The engineer and society PO-f	Environment and sustainability PO-g	Ethics PO-h	Individual and team work PO-i	Communication PO-j	Project management and finance PO-k	Life-long Learning PO-l	Honing Domain Knowledge PSO-m	Innovation and design PSO-n	Entrepreneurship Skills PSO-o	Ethical values PSO-p	Learning	Focus on	Assessm
CO1	Use the cloud tool kits.	1	1	2	1	3	1	1	1	1	1	1	3	3	1	1	1	Knowledg	Employab	Practicals
CO2	Implement applications on the Cloud	1	3	3	3	3	2	2	1	3	3	3	3	3	2	3	1	Apply	Enterpren	Practicals
CO3	To install cloud computing environments	1	1	2	1	3	1	1	1	2	1	2	3	3	1	1	1	Knowledg	Employab	Practicals
CO4	To develop any one type of cloud	1	2	3	1	3	2	2	1	3	3	2	3	3	2	3	1	Apply	Enterpren	Practicals
CO5	To explore future trends of cloud computing	1	1	2	2	3	2	2	1	3	3	2	3	2	2	3	1	Understar	Enterpren	Practicals

CO No.	CO Statel	PO-a Engineering Knowledge	PO-b Problem Analysis	PO-c Design/development of solutions	PO-d Conduct investigations of complex problems	PO-e Modern tool usage	PO-f The engineer and society	PO-g Environment and sustainability	PO-h Ethics	PO-i Individual and team work	PO-j Communication	PO-k Project management and finance	PO-l Life-long Learning	PSO-m Honing Domain Knowledge	PSO-n Innovation and design	PSO-o Entrepreneurship Skills	PSO-p Ethical values	Learning	Focus on	Assessment Tools to Measure Attainment of CO
CO1	Understand various entropies and Define the information theories.	3	2	2	2	1	1	1		1	2	2	1	2	1			Understar	Employab	MSTs, ESE, Class/Quiz Tests
CO2	Apply source coding techniques	3	3	3	3	3	2	2	1	2	2	2	3	3	3	2	1	Create	Entrepren	MSTs, ESE, Class/Quiz Tests
CO3	Compute the capacity of various types of channels.	3	3	3	2	3	2	2		2	1	2	2	3	2	1		Design	Entrepren	MSTs, ESE, Class/Quiz Tests
CO4	Understand and Construct codes using different error control techniques.	3	2	2	2	3	3	2	1	2	2	2	3	3	3	3		Understar	Entrepren	MSTs, ESE, Class/Quiz Tests

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| CO5 | Apply various coding schemes for text, speech and audio. | 3 | 2 | 3 | 3 | 3 | 2 | 2 | | 2 | 2 | 3 | 3 | 3 | 3 | 2 | | Understar | Entrepren | MSTs, ESE, Class/Quiz Tests |

CO No.	CO Statement	PO-a (Engineering Knowledge)	PO-b (Problem Analysis)	PO-c (Design/development of solutions)	PO-d (Conduct investigations of complex problems)	PO-e (Modern tool usage)	PO-f (The engineer and society)	PO-g (Environment and sustainability)	PO-h (Ethics)	PO-i (Individual and team work)	PO-j (Communication)	PO-k (Project management and finance)	PO-l (Life-long Learning)	PSO-m (Honing Domain Knowledge)	PSO-n (Innovation and design)	PSO-o (Entrepreneurship Skills)	PSO-p (Ethical values)	Learning	Focus on	Assessment Tools to Measure Attainment of CO
CO1	Compare various capacity reduction based coding techniques for image and video type of data.	3	3	2	2	3	2	3		3	3	3	3	3	3	3		Understan	Employab	Practical Assignments
CO2	Implement various error control techniques for Convolutional codes	3	3	3	3	3	2	2	2	3	2	2	3	3	3	3	2	Understan	Entrepren	Practical Assignments
CO3	Illustrate various security oriented coding techniques for Block codes	3	3	3	3	3	3	3	2	3	3	3	3	3	3	3	2	Understan	Entrepren	Practical Assignments

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| CO4 | calculate entropy, joint entropy, relative entropy, conditional entropy, and channel capacity of a system | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | Understar | Entrepren | Practical Assignments |

Department Computer Science and Engineering
Program : B.Tech. (Computer Science and Engineering)
BTCS(type code) : BTCS-617-18 Data Science Lab

CO No.	CO State:	PO-a Engineering Knowledge	PO-b Problem Analysis	PO-c Design/development of solutions	PO-d Conduct investigations of complex problems	PO-e Modern tool usage	PO-f The engineer and society	PO-g Environment and sustainability	PO-h Ethics	PO-i Individual and team work	PO-j Communication	PO-k Project management and finance	PO-l Life-long Learning	PSO-m Honing Domain Knowledge	PSO-n Innovation and design	PSO-o Entrepreneurship Skills	PSO-p Ethical values	Learning	Focus on	Assessment Tools to Measure Attainment of CO
CO1	Plan the projects in the domain of data science.	1	3	2	3	2	2	1	1	3	3	3	3	3	3	3	1	Analyze	Enterpren	MSTs, ESE, Class/Quiz Tests
CO2	Use data analytics tools towards problem solving and solution analysis.	1	1	3	1	3	1	1	1	1	1	2	3	3	2	3	1	Knowledg	Employab	MSTs, ESE, Class/Quiz Tests
CO3	Apply Mathematical sciences and recent technologies in Computer Science to solve real life problems	3	3	3	3	1	2	1	1	2	3	3	3	3	3	3	1	Apply	Enterpren	MSTs, ESE, Class/Quiz Tests

| CO4 | Apply data science concepts and methods to **solve** problems in real-world context. | 3 | 3 | 3 | 3 | 1 | 2 | 1 | 1 | 2 | 3 | 3 | 3 | 3 | 2 | 3 | 1 | Apply | Employab | MSTs, ESE, Class/Quiz Tests |

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Computer Science and Engineering
: B.Tech. (Computer Science and Engineering)
: (Soft Computing)

Engineering Knowledge	Problem Analysis	Design/development of solutions	Conduct investigations of complex problems	Modern tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long Learning	Honing Domain Knowledge	Innovation and design	Entrepreneurship Skills	Ethical values			
PO-a	PO-b	PO-c	PO-d	PO-e	PO-f	PO-g	PO-h	PO-i	PO-j	PO-k	PO-l	PSO-m	PSO-n	PSO-o	PSO-p	Learning	Focus on	Assessment Tools to Measure Attainment of CO
3	2	1	3									3	1			understan	Employab	
3	2	3	3	2	1							3	2			Design	Employab	
3	2	3	3	2	2							3	2			Apply	Employab	MSTs, ESE, Class/Quiz Tests
3	2	3	3	2	1							3	2			Apply	Employab	
3	2	3	3	2	2							3	2			Design	Employab	

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Department : Computer Science and Engineering
Program : B.Tech (Computer Science and Engineering)
BTCS(612-18UC) : Soft Computing Lab

CO No.	CO Statements (Soft Computing Lab)	Engineering Knowledge PO-a	Problem Analysis PO-b	Design/development of solutions PO-c	Conduct investigations of complex problems PO-d	Modern tool usage PO-e	The engineer and society PO-f	Environment and sustainability PO-g	Ethics PO-h	Individual and team work PO-i	Communication PO-j	Project management and finance PO-k	Life-long Learning PO-l	Having Domain Knowledge PSO-m	Innovation and design PSO-n	Entrepreneurship Skills PSO-o	Ethical values PSO-p	Learning Level (understand/analys of design etc)	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
CO1	Reveal different applications of these models to solve engineering and other problems.	3	3	3	3	3	3	2	1	1	2	2	1	2	2			Estimate	Employability	MSTs, ESE, Class/Quiz Tests
CO2	Apply fuzzy logic and reasoning to handle uncertainty and solve engineering problems	3	3	3	3	3	3	2	1	1	2	2	3	3	2	1	1	Apply	Employability	MSTs, ESE, Class/Quiz Tests
CO3	Apply genetic algorithms to combinatorial optimization problems	3	3	3	3	3	3	2	1	2	1	2	2	3	2	1		Design	Employability	MSTs, ESE, Class/Quiz Tests
CO4	Effectively use existing software tools to solve real problems using a soft computing approach	3	3	3	3	3	3	1	1	1	2	2	3	3	2	1	1	Compute	Employability	MSTs, ESE, Class/Quiz Tests
CO5	Evaluate and compare solutions by various soft computing approaches for a given problem.	3	3	3	3	3	3	2	1	1	2	3	3	3	2	1		Evaluate	Employability	MSTs, ESE, Class/Quiz Tests

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Department Computer Science and Engineering
Program : B.Tech. (Computer Science and Engineering)
BTCS(type code) : BTCS-619-18 Machine Learning Lab

CO No.	CO Statements	PO-a Engineering Knowledge	PO-b Problem Analysis	PO-c Design/development of solutions	PO-d Conduct investigations of complex problems	PO-e Modern tool usage	PO-f The engineer and society	PO-g Environment and sustainability	PO-h Ethics	PO-i Individual and team work	PO-j Communication	PO-k Project management and finance	PO-l Life-long Learning	PSO-m Honing Domain Knowledge	PSO-n Innovation and design	PSO-o Entrepreneurship Skills	PSO-p Ethical values	Learning	Focus on	Assessment Tools to Measure Attainment of CO
CO1	**Solve problems using** the machine learning models.	1	2	2	2	3	1	1	1	2	1	2	3	2	2	2	1	Apply	Employab	MSTs, ESE, Class/Quiz Tests
CO2	Apply various reinforcement algorithms to solve real time complex problems.	2	3	2	2	3	1	1	1	2	2	2	3	3	3	2	1	Apply	Enterpren	MSTs, ESE, Class/Quiz Tests
CO3	Identify the core components of deep neural network model.	1	2	2	1	3	1	1	1	2	1	2	3	2	1	1	1	Knowledg	Employab	MSTs, ESE, Class/Quiz Tests

| CO4 | Implement unsupervised models through programming language. | 1 | 2 | 2 | 2 | 3 | 1 | 1 | 1 | 2 | 1 | 2 | 3 | 2 | 2 | 2 | 1 | Apply | Employab | MSTs, ESE, Class/Quiz Tests |

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Department Computer Science and Engineering
Program : B.Tech. (Computer Science and Engineering)
BTCS(type code) Speech and Natural Language Processing

CO No.	CO State	PO-a Engineering Knowledge	PO-b Problem Analysis	PO-c Design/development of solutions	PO-d Conduct investigations of complex problems	PO-e Modern tool usage	PO-f The engineer and society	PO-g Environment and sustainability	PO-h Ethics	PO-I Individual and team work	PO-j Communication	PO-k Project management and finance	PO-l Life-long Learning	PSO-m Honing Domain Knowledge	PSO-n Innovation and design	PSO-o Entrepreneurship Skills	PSO-p Ethical values	Learning Focus on	Assessment Tools to Measure Attainment of CO
CO1		3	2	3	2	3	3	1	1	3	3	2	3	2	2	3	1		MSTs, ESE, Class/Quiz Tests
CO2		3	3	3	3	3	3	1		3	3	2	3	1	2	2	1		MSTs, ESE, Class/Quiz Tests
CO3		2	3	3	3	3	3	1		3	3	2	2	2	3	2			MSTs, ESE, Class/Quiz Tests
CO4		2	1	1	2	3	2	2	1	2	2	2	2	1	2	2	1		MSTs, ESE, Class/Quiz Tests

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CO No.	CO Stater	PO-a Engineering Knowledge	PO-b Problem Analysis	PO-c Design/development of solutions	PO-d Conduct investigations of complex problems	PO-e Modern tool usage	PO-f The engineer and society	PO-g Environment and sustainability	PO-h Ethics	PO-i Individual and team work	PO-j Communication	PO-k Project management and finance	PO-l Life-long Learning	PSO-m Honing Domain Knowledge	PSO-n Innovation and design	PSO-o Entrepreneurship Skills	PSO-p Ethical values	Learning	Focus on	Assessment Tools to Measure Attainment of CO
CO1	Interact with a blockchai n system by sending and reading transactio ns.	3	3	2	2	3	3	3	2	3	2	2	3	3	3	2	2	Understar	Employab	Practical Assignments
CO2	Design, build, and deploy a distribute d applicatio n.	3	3	3	3	3	3	3		3	3	3	3	3	3	3		Design	Entrepren	Practical Assignments
CO3	Evaluate security, privacy, and efficiency of a given blockchai n system.	3	3	3	3	3	3	2	3	3	3	3	3	3	3	3	3	Design	Entrepren	Practical Assignments

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Department Computer Science and Engineering
Program : B.Tech. (Computer Science and Engineering)
BTCS 614-18UC : (Software Defined Networks)

CO No.	CO State	PO-a Engineering Knowledge	PO-b Problem Analysis	PO-c Design/development of solutions	PO-d Conduct investigations of complex problems	PO-e Modern tool usage	PO-f The engineer and society	PO-g Environment and sustainability	PO-h Ethics	PO-i Individual and team work	PO-j Communication	PO-k Project management and finance	PO-l Life-long Learning	PSO-m Honing Domain Knowledge	PSO-n Innovation and design	PSO-o Entrepreneurship Skills	PSO-p Ethical values	Learning	Focus on	Assessment Tools to Measure Attainment of CO
CO1	To define	3																		
CO2	To descri	3		3										3				understan	Employab	
CO3	To provid	3			1									3				Design	Employab	
CO4	To design	3	2	3	1	1								3	2			Apply	Employab	MSTs, ESE, Class/Quiz Tests
CO5	To develop	3	2	3	1							1		3	2			Design	Employab	
CO6	To identify	3	2				1		1					3			1	identify	Employab	

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Department Computer Science and Engineering
Program : B.Tech (Computer Science and Engineering)
BTCS712-18UC : (Digital Image Processing)

CO No.	CO State	PO-a (Engineering Knowledge)	PO-b (Problem Analysis)	PO-c (Design/development of solutions)	PO-d (Conduct investigations of complex problems)	PO-e (Modern tool usage)	PO-f (The engineer and society)	PO-g (Environment and sustainability)	PO-h (Ethics)	PO-i (Individual and team work)	PO-j (Communication)	PO-k (Project management and finance)	PO-l (Life-long Learning)	PSO-m (Honing Domain Knowledge)	PSO-n (Innovation and design)	PSO-o (Entrepreneurship Skills)	PSO-p (Ethical values)	Learning	Focus on	Assessment Tools to Measure Attainment of CO
CO1	Understand the basic concepts of DIP	2	1	2	1	1	2	3		1		1	3	3	1	1		3	3	MSTs, ESE, Class/Quiz Tests
CO2	Improve the quality of digital images	3	2	3	3	2	1			1	1	1	2	3	3	1		2	2	MSTs, ESE, Class/Quiz Tests
CO3	Understand and De-noise Digital Images	2	3	3	2	1	1	1		1			2	3	3	1	1	2	2	MSTs, ESE, Class/Quiz Tests
CO4	Segment digital images and extract various features from digital images	2	2	2	2	3	1		1	1	1	1	2	3	2	1	1	2	3	MSTs, ESE, Class/Quiz Tests

| CO5 | Understand various image compression techniques and apply such techniques to compress digital images for reducing the sizes of digital images. | 3 | 2 | 3 | 2 | 3 | 2 | 1 | 3 | 1 | 2 | 3 | 3 | 2 | 2 | 3 | 3 MSTs, ESE, Class/Quiz Tests |

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Department Computer Science and Engineering
Program : B.Tech. (Computer Science and Engineering)
BTCS715-18UC) : (Digital Image Processing Lab)

CO No.	CO State	PO-a Engineering Knowledge	PO-b Problem Analysis	PO-c Design/development of solutions	PO-d Conduct investigations of complex problems	PO-e Modem tool usage	PO-f The engineer and society	PO-g Environment and sustainability	PO-h Ethics	PO-I Individual and team work	PO-j Communication	PO-k Project management and finance	PO-l Life-long Learning	PSO-m Honing Domain Knowledge	PSO-n Innovation and design	PSO-o Entrepreneurship Skills	PSO-p Ethical values	Learning	Focus on	Assessment Tools to Measure Attainment of CO
CO1	develop any image processing application.	2	2	3	3	3	3	2	2	2	2	2	3	3	3	3	2	3	3	MSTs, ESE, Class/Quiz Tests
CO2	understand the rapid advances in Machine vision.	2	2	3	3	3	2	2	1	3	3	3	3	3	3	3	2	3	3	MSTs, ESE, Class/Quiz Tests
CO3	learn different techniques employed for the enhancement of images.	3	2	3	3	3	3	3	2	2	2	3	3	3	2	3	2	3	3	MSTs, ESE, Class/Quiz Tests

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CO4	Perform image enhancement techniques in spatial and frequency domain	2	3	3	3	2	2	3	1	2	2	3	3	3	3	3	2	3	3

Department Computer Science and Engineenng
Program : B.Tech. (Computer Science and Engineering)
BTCS(type code) : (type course name)

CO No.	CO Statements (UC-BTEC)	PO-a Engineering Knowledge	PO-b Problem Analysis	PO-c Design/development of solutions	PO-d Conduct investigations of complex problems	PO-e Modern tool usage	PO-f The engineer and society	PO-g Environment and sustainability	PO-h Ethics	PO-i Individual and team work	PO-j Communication	PO-k Project management and finance	PO-l Life-long Learning	PSO-m Honing Domain Knowledge	PSO-n Innovation and design	PSO-o Entrepreneurship Skills	PSO-p Ethical values	Learning	Focus on	Assessment Tools to Measure Attainment of CO
CO1	For a given algorithm student will able to analyze the algorithms to determine the time and computation complexity and justify the correctness;	3	3	2	3	2	3	0	0	0	0	1	3	3	3	1	0			MSTs, ESE, Class/Quiz Tests
CO2	Student will be able to handle operation like searching, insertion, deletion, traversing on various Data Structures and determine time and computational complexity	3	3	2	2	1	2	0	0	1	0	1	3	3	3	1	0			MSTs, ESE, Class/Quiz Tests
CO3	Student will able to write an algorithm Selection Sort, Bubble Sort, Insertion Sort, Quick Sort, Merge Sort, Heap Sort and compare their performance in term of Space and Time complexity;	3	3	3	3	1	1	0	0	1	0	1	3	3	3	1	0			MSTs, ESE, Class/Quiz Tests
CO4	Students will be able to choose appropriate Data Structure as applied to specific problem definition	3	3	3	3	2	2	0	0	3	0	3	3	3	3	1	0			
CO5	Demonstrate the reusability of Data Structures for implementing complex iterative problems	3	3	3	3	2	2	0	0	3	0	3	3	3	3	1	0			

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Department Computer Science and Engineering
Program : B.Tech. (Computer Science and Engineering)
BTCS(type code) : (type course name)

CO No.	CO State	Engineering Knowledge PO-a	Problem Analysis PO-b	Design/development of solutions PO-c	Conduct investigations of complex problems PO-d	Modern tool usage PO-e	The engineer and society PO-f	Environment and sustainability PO-g	Ethics PO-h	Individual and team work PO-i	Communication PO-j	Project management and finance PO-k	Life-long Learning PO-l	Honing Domain Knowledge PSO-m	Innovation and design PSO-n	Entrepreneurship Skills PSO-o	Ethical values PSO-p	Learning	Focus on	Assessment Tools to Measure Attainment of CO
CO1	Identify classes, objects, members of a class and the relationships among them needed to solve a specific problem operotors	3	3	3	3	2	3	0	0	0	0	1	3	3	3	1	0			MSTs, ESE, Class/Quiz Tests
CO2	Demonstrate the concept of constructors and destructors. And create new definitions for some of the operators	3	3	3	3	1	2	0	0	1	0	1	3	3	3	1	0			MSTs, ESE, Class/Quiz Tests
CO3	Create function templates, overload function templates	3	3	3	3	1	1	0	0	1	0	1	3	3	3	1	0			MSTs, ESE, Class/Quiz Tests

Department Computer Science and Engineering
Program : B.Tech. (Computer Science and Engineering)
BTCS(type code) : (type course name)

CO No.	CO Statements (UC-BTEC-	PO-a Engineering Knowledge	PO-b Problem Analysis	PO-c Design/development of solutions	PO-d Conduct investigations of complex problems	PO-e Modern tool usage	PO-f The engineer and society	PO-g Environment and sustainability	PO-h Ethics	PO-i Individual and team work	PO-j Communication	PO-k Project management and finance	PO-l Life-long Learning	PSO-m Honing Domain Knowledge	PSO-n Innovation and design	PSO-o Entrepreneurship Skills	PSO-p Ethical values	Learning Focus on	Assessment Tools to Measure Attainment of CO
CO1	Improve practical skills in designing and implementing basic linear data structure algorithms	3	3	3	3	2	3	0	0	0	0	1	3	3	3	1	0		MSTs, ESE, Class/Quiz Tests
CO2	Improve practical skills in designing and implementing Non-linear data structure algorithms;	3	3	3	3	1	2	0	0	1	0	1	3	3	3	1	0		MSTs, ESE, Class/Quiz Tests
CO3	Use Linear and Non-Linear data structures to solve relevant problems;	3	3	3	3	1	1	0	0	1	0	1	3	3	3	1	0		MSTs, ESE, Class/Quiz Tests
CO4	Choose appropriate Data Structure as applied to specific problem definition;	3	3	3	3	2	2	0	0	3	0	3	3	3	3	1	0		
CO5	Implement Various searching algorithms and become familiar with their design methods	3	3	3	3	2	2	0	0	3	0	3	3	3	3	1	0		

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partment Computer Science and Engineering
Program : B.Tech. (Computer Science and Engineering)
S(401-18) : Discrete Mathematics

CO No.	CO State	PO-a	PO-b	PO-c	PO-d	PO-e	PO-f	PO-g	PO-h	PO-i	PO-j	PO-k	PO-l	PSO-m	PSO-n	PSO-o	PSO-p	Learning	Focus on	Assessment Tools to Measure Attainment of CO
CO1	To be able to express logical sentence in terms of predicates, quantifiers, and logical connectives	3	3	3	2		1	1		1				2				Understan	mployabili	MSTs, ESE, Class/Quiz Tests
CO2	To derive the solution for a given problem using deductive logic and prove the solution based on logical inference	3	3	3	3		1			2			1	2				Design	mployabili	MSTs, ESE, Class/Quiz Tests

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CO	Description																		Design	Employability	MSTs, ESE, Class/Quiz Tests
CO3	For a given a mathematical problem, classify its algebraic structure	3	3	3	2					1				1	1				Design	Employabili	MSTs, ESE, Class/Quiz Tests
CO4	To evaluate Boolean functions and simplify expressions using the properties of Boolean algebra	3	3	3	3		2			2	2	1	1	1					Design	Employabili	MSTs, ESE, Class/Quiz Tests
CO5	To develop the given problem as graph networks and solve with techniques of graph theory.	3	3	3	3	1	2	1	1	2	2	2	2	2	2	2	1	Design	Employabili	MSTs, ESE, Class/Quiz Tests

CO No.	CO Statements (UC)	Engineering Knowledge PO-a	Problem Analysis PO-b	Design/development of solutions PO-c	Conduct investigations of complex problems PO-d	Modern tool usage PO-e	The engineer and society PO-f	Environment and sustainability PO-g	Ethics PO-h	Individual and team work PO-i	Communication PO-j	Project management and finance PO-k	Life-long Learning PO-l	Honing Domain Knowledge PSO-m	Innovation and design PSO-n	Entrepreneurship Skills PSO-o	Ethical values PSO-p	Learning	Focus on	Assessment Tools to Measure Attainment of CO
CO1	Understand functional block diagram of microprocessor	3	1	2	2	2	1			1	1		3	3		1		3	3	MSTs, ESE, Class/Quiz Tests
CO2	Apply instruction set for Writing assembly language programs	3	2	3	3	2		1		3	2	2	3	3	1	3	1	3	3	MSTs, ESE, Class/Quiz Tests
CO3	Design a memory module and analyze its operation by interfacing with the CPU;	3	3	3	3	2				3	2	1	3	3	3	2		3	3	MSTs, ESE, Class/Quiz Tests
CO4	Classify hardwired and microprogrammed control units	3	1	2	2	3	1	1		1		1	3	3	1	1	1	2	2	MSTs, ESE, Class/Quiz Tests
CO5	Understand the concept of pipelining and its performance metrics	3	3	3	3	3	1		1	3	2	1	3	3	2	3	1	3	3	MSTs, ESE, Class/Quiz Tests

Department Computer Science and Engineering
Program : B.Tech. (Computer Science and Engineering)

BTCS(402-18) : Operating Systems

CO No.	CO State	PO-a Engineering Knowledge	PO-b Problem Analysis	PO-c Design/development of solutions	PO-d Conduct investigations of complex problems	PO-e Modern tool usage	PO-f The engineer and society	PO-g Environment and sustainability	PO-h Ethics	PO-i Individual and team work	PO-j Communication	PO-k Project management and finance	PO-l Life-long Learning	PSO-m Honing Domain Knowledge	PSO-n Innovation and design	PSO-o Entrepreneurship Skills	PSO-p Ethical values	Learning	Focus on	Assessment Tools to Measure Attainment of CO
CO1	Explain basic operating system concepts such as overall architecture, system calls, user mode and kernel mode;	3	2	2	1	1	2	1		2	1	1	2	2	2			Understa	mployabili	MSTs, ESE, Class/Quiz Tests
CO2	Distinguish concepts related to processes, threads, process scheduling, race conditions and critical sections;	3	3	3	3	3	2	2	1	2	2	2	3	3	3	2	1	Design	repreneur	MSTs, ESE, Class/Quiz Tests

CO	Course Outcome	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16			
CO3	Analyze and apply CPU scheduling algorithms, deadlock detection and prevention algorithms;	3	3	3	3	3	3	2	1	2	2	2	3	3	3	2	1	Design	repreneur	MSTs, ESE, Class/Quiz Tests
CO4	Examine and categorize various memory management techniques like caching, paging, segmentation, virtual memory, and thrashing;	3	3	3	3	3	3	1		2	2	2	3	3	2			Analyse	repreneur	MSTs, ESE, Class/Quiz Tests
CO5	Design and implement file management system;	3	3	3	3	3	3	2		2	2	2	3	3	3	2		Design	repreneur	MSTs, ESE, Class/Quiz Tests
CO6	Appraise high-level operating systems concepts such as file systems, disk-scheduling algorithms and various file systems.	3	3	3	3	3	3	2	1	2	2	2	3	3	3	3	1	Understan	repreneur	MSTs, ESE, Class/Quiz Tests

Department Computer Science and Engineering
Program : B.Tech. (Computer Science and Engineering)
BTCS 403-18 : (Design& Analysis of Algorithms)

CO No.	CO State	PO-a Engineering Knowledge	PO-b Problem Analysis	PO-c Design/development of solutions	PO-d Conduct investigations of complex problems	PO-e Modern tool usage	PO-f The engineer and society	PO-g Environment and sustainability	PO-h Ethics	PO-I Individual and team work	PO-J Communication	PO-k Project management and finance	PO-l Life-long Learning	PSO-m Homing Domain Knowledge	PSO-n Innovation and design	PSO-o Entrepreneurship Skills	PSO-p Ethical values	Learning	Focus on	Assessment Tools to Measure Attainment of CO
CO1	For a give	3	3	1	3															
CO2	Explain w	3	3	3	3									3	2			Understan	Employab	
CO3	Explain m	3	3	3	3	1	1							3	2			Analyse	Employab	
CO4	Demonstr	3	3	3	3	2	1							3	2			Analyse	Employab	MSTs, ESE, Class/Quiz Tests
CO5	Examine th	3	3	3	3	2	2							3	2			Design	Employab	
													2	3	2			Design	Employab	

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Department Computer Science and Engineering
Program : B.Tech. (Computer Science and Engineering)
BTES(402-18) : (Computer Organisation and Architecture Lab)

CO No.	CO Statement	PO-a (Engineering Knowledge)	PO-b (Problem Analysis)	PO-c (Design/development of solutions)	PO-d (Conduct investigations of complex problems)	PO-e (Modern tool usage)	PO-f (The engineer and society)	PO-g (Environment and sustainability)	PO-h (Ethics)	PO-i (Individual and team work)	PO-j (Communication)	PO-k (Project management and finance)	PO-l (Life-long Learning)	PSO-m (Honing Domain Knowledge)	PSO-n (Innovation and design)	PSO-o (Entrepreneurship Skills)	PSO-p (Ethical values)	Learning	Focus on	Assessment Tools to Measure Attainment of CO
CO1	Assemble personal compuer	3	2	2	3	2	2	2	1	3	1	1	3	3	1	2	1	3	3	MSTs, ESE, Class/Quiz Tests
CO2	Implement the various assembly language problems for basic arithmetic and logical operations	3	3	3	3	2	1			3	2	3	3	3	1	1		3	3	MSTs, ESE, Class/Quiz Tests
CO3	Demonstrate the functioning of microprocessor /microcontroller based systems with I/O Interface	3	1	3	3	1	1			2	2	3	3	3	2	3	1	3	3	MSTs, ESE, Class/Quiz Tests

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Computer Science and Engineering
: B.Tech. (Computer Science and Engineering)
: Operating Systems Lab

CO Statements (UC-BTEC-502-18: Digital Signal Processing)	Engineering Knowledge PO-a	Problem Analysis PO-b	Design/development of solutions PO-c	Conduct investigations of complex problems PO-d	Modern tool usage PO-e	The engineer and society PO-f	Environment and sustainability PO-g	Ethics PO-h	Individual and team work PO-i	Communication PO-j	Project management and finance PO-k	Life-long Learning PO-l	Mining Domain Knowledge PSO-m	Innovation and design PSO-n	Entrepreneurship Skills PSO-o	Ethical values PSO-p	Learning Level	Focus on Employab.	Assessment Tools to Measure Attainment of CO
Understand and implement basic services and functionalities of the operating system;	3	3	3	3	3	2	2		3	2	3	3	3	3	2		Understand	Employability	MSTs, ESE, Practical Assignments Tests
Analyze and simulate CPU Scheduling Algorithms like FCFS, Round Robin, SJF, and Priority;	3	3	3	3	3	3	3	1	3	3	3	3	3	3	3	1	Analyse	Entrepreneurship	MSTs, ESE, Practical Assignments Tests
Implement commands for files and directories;	3	3	3	3	3	2	2		2	2	2	2	3	3	2		Design	Entrepreneurship	MSTs, ESE, Practical Assignments Tests
Understand and implement the concepts of shell programming;	3	2	3	2	3	3	3		2	3	2	3	3	3	2		Understand & Design	Entrepreneurship	MSTs, ESE, Practical Assignments Tests
Simulate file allocation and organization techniques;	3	3	3	3	3	2	2		3	2	2	2	2	2	2		Understand & Design	Entrepreneurship	MSTs, ESE, Practical Assignments Tests
Understand the concepts of deadlock in operating systems and implement them in multiprogramming system.	3	3	3	3	3	3	3	1	3	3	3	3	3	3	3	1	Design	Entrepreneurship	MSTs, ESE, Practical Assignments Tests

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Department Computer Science and Engineering
Program : B.Tech. (Computer Science and Engineering)
BTCS : (DAA Lab)

CO No.	CO Statements	Engineering Knowledge PO-a	Problem Analysis PO-b	Design/development of solutions PO-c	Conduct investigations of complex problems PO-d	Modern tool usage PO-e	The engineer and society PO-f	Environment and sustainability PO-g	Ethics PO-h	Individual and team work PO-i	Communication PO-j	Project management and finance PO-k	Life-long Learning PO-l	Honing Domain Knowledge PSO-m	Innovation and design PSO-n	Entrepreneurship Skills PSO-o	Ethical values PSO-p	Learning Level(under stand/analy se/ deisgn etc)	Focus on Employabili ty / Entrepreneu rship	Assessment Tools to Measure Attainment of CO
CO1	Design and implement complex problems with different techniques	3	3	3	3	3	2			2				3	3			design	Employability	
CO2	Understand comparative performance of strategies and hence choose appropriate, to apply to specific problem definition;	3	3	3	3	3	2			2				3	3			understand	Employability	MSTs, ESE, Class/Quiz Tests
CO3	Implement Various tree and graph based algorithms and become familiar with their design methods;	3	3	3	2	3	1							3	1	2		Apply	Employability	
CO4	Design and Implement heuristics for real world problems.	3	3	3	3	3	2							3	3		2	Design	Employability	

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Department Computer Science and Engineering
Program : B.Tech. (Computer Science and Engineering)
BTCS(type code) : BTCS-501-18 Database Management System

CO No.	CO Statements (U..	Engineering Knowledge PO-a	Problem Analysis PO-b	Design/development of solutions PO-c	Conduct investigations of complex problems PO-d	Modern tool usage PO-e	The engineer and society PO-f	Environment and sustainability PO-g	Ethics PO-h	Individual and team work PO-i	Communication PO-j	Project management and finance PO-k	Life-long Learning PO-l	Honing Domain Knowledge PSO-m	Innovation and design PSO-n	Entrepreneurship Skills PSO-o	Ethical values PSO-p	Learning	Focus on	Assessment Tools to Measure Attainment of CO
CO1	write relational algebra expressions for a query and optimize the Developed expressions	1	3	3	2	0	0	0	0	3	3	2	2	3	2	1	0	understan	employabi	MSTs, ESE, Class/Quiz Tests
CO2	design the databases using ER method and normalization.	1	3	3	2	2	1	1	1	3	3	2	2	3	3	3	1	Analyse	enterpren	MSTs, ESE, Class/Quiz Tests
CO3	construct the SQL queries for Open source and Commercial DBMS-MYSQL, ORACLE, and DB2.	1	2	2	2	2	1	1	1	2	2	2	2	3	2	3	1	design	enterpren	MSTs, ESE, Class/Quiz Tests
CO4	determine the transaction atomicity, consistency, isolation, and durability	1	2	1	1	1	0	0	0	3	3	2	2	3	1	1	0	understan	employabi	MSTs, ESE, Class/Quiz Tests
CO5	Implement the isolation property, including locking, time stamping based on concurrency control and Serializability of scheduling	1	2	2	2	1	1	1	1	3	3	2	2	3	2	2	1	design	employabi	MSTs, ESE, Class/Quiz Tests

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Department Computer Science and Engineering

Program : B.Tech. (Computer Science and Engineering)

BTCS(502-18) :Formal Language & Automata Theory

CO No.	CO Statements	PO-a	PO-b	PO-c	PO-d	PO-e	PO-f	PO-g	PO-h	PO-i	PO-j	PO-k	PO-l	PSO-m	PSO-n	PSO-o	PSO-p	Learning	Focus on	Assessment Tools to Measure Attainment of CO
		Engineering Knowledge	Problem Analysis	Design/development of solutions	Conduct investigations of complex problems	Modem tool usage	The engineer and society	Environment and sustainability	Ethics	Individual and team work	Communication	Project management and finance	Life-long Learning	Honing Domain Knowledge	Innovation and design	Entrepreneurship Skills	Ethical values			
CO1	Write a formal notation for strings, languages and machines.	3	2	2	1	1				1			2	1	1			Understan	Employab	MSTs, ESE, Class/Quiz Tests
CO2	Design finite automata to accept a set of strings of a language.	3	3	3	2	1	1	1		1		1	2	2	2	2		Design	Employab	MSTs, ESE, Class/Quiz Tests
CO3	For a given language determine whether the given language is regular or not.	3	3	3	3	2	2	1	1	2	1	2	2	3	3	2	1	Analyse	Entrepren	MSTs, ESE, Class/Quiz Tests

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CO	Outcome	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
CO4	Design context free grammars to generate strings of context free language.	3	2	3	2	1		1		2		2	1	2	2	2		Design	Entrepren	MSTs, ESE, Class/Quiz Tests
CO5	Determine equivalence of languages accepted by Push Down Automata and languages generated by context free grammars	3	3	3	3	2	1	2	1	2	1	1	3	3	3	2	1	DEsign	Entrepren	MSTs, ESE, Class/Quiz Tests
CO6	Write the hierarchy of formal languages, grammars and machines.	2	1	1	1		1	1			1	1	1	1				Understan	Employab	MSTs, ESE, Class/Quiz Tests
CO7	Distinguish between computability and non-computability and Decidability and undecidability.	2	1	1	1		1	1		1		1	1	2	1			Understan	Employab	MSTs, ESE, Class/Quiz Tests

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Department Computer Science and Engineering
Program : B.Tech. (Computer Science and Engineering)

BTCS(503-18) : Software Engineering

CO No.	CO Statements (UC-BTEC-502-18: Digital Signal Processing)	PO-a Engineering Knowledge	PO-b Problem Analysis	PO-c Design/development of solutions	PO-d Conduct investigations of complex problems	PO-e Modern tool usage	PO-f The engineer and society	PO-g Environment and sustainability	PO-h Ethics	PO-i Individual and team work	PO-j Communication	PO-k Project management and finance	PO-l Life-long Learning	PSO-m Honing Domain Knowledge	PSO-n Innovation and design	PSO-o Entrepreneurship Skills	PSO-p Ethical values	Learning	Focus on	Assessment Tools to Measure Attainment of CO
CO1	Students should be able to identify the need for engineering approach to software development and various processes of requirements analysis for software engineering problems.	3	2	2	2	1	2	2	2	2	3	3	3	3	2		2	Understar	Employab	MSTs, ESE, Class/Quiz Tests

CO	Description																			
CO2	Analyze various software engineering models and apply methods for design and development of software projects.	3	3	3	2	3	3	2	1	3	2	3	3	3	2	3	1	Analyse	Entrepren	MSTs, ESE, Class/Quiz Tests
CO3	Work with various techniques, metrics and strategies for testing software projects.	3	3	3	2	3	2	1	1	2	2	2	3	3	3	2	1	Create	Entrepren	MSTs, ESE, Class/Quiz Tests
CO4	Identify and apply the principles, processes and main knowledge areas for Software Project Management	3	3	3	3	3	3	2	1	3	1	1	3	3	3	3	1	Design	Entrepren	MSTs, ESE, Class/Quiz Tests
CO5	Proficiently apply standards, CASE tools and techniques for engineering software projects	3	3	3	3	3	3	3		2	2	2	3	3	3	3		Design	Entrepren	MSTs, ESE, Class/Quiz Tests

Department Computer Science and Engineering
Program : B.Tech. (Computer Science and Engineering)
BTCS(type code) : BTCS 504 -18UC (Computer Network)

CO No.	CO Statements (UC-BTEC-502-18: Digital Signal Processing)	Engineering Knowledge PO-a	Problem Analysis PO-b	Design/development of solutions PO-c	Conduct investigations of complex problems PO-d	Modern tool usage PO-e	The engineer and society PO-f	Environment and sustainability PO-g	Ethics PO-h	Individual and team work PO-i	Communication PO-j	Project management and finance PO-k	Life-long Learning PO-l	Honing Domain Knowledge PSO-m	Innovation and design PSO-n	Entrepreneurship Skills PSO-o	Ethical values PSO-p	Learning	Focus on	Assessment Tools to Measure Attainment of CO
CO1		3	3	3	2	3	3	3	2	2	3	1	3	3	2	2	2		2	MSTs, ESE, Class/Quiz Tests
CO2		3	2	3	2	3	3	3	2	3	3	2	3	3	3	1	1		2	MSTs, ESE, Class/Quiz Tests
CO3		3	3	3	3	3	3	3	2	3	3	1	3	3	2	2	1		3	MSTs, ESE, Class/Quiz Tests
CO4		3	3	3	3	3	3	3	3		3	1	3	3	3	2	2		3	MSTs, ESE, Class/Quiz Tests

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CO No.	CO Statements (UC-BTES-402-18: Computer Organisation and Architecture Lab)	PO-a Engineering Knowledge	PO-b Problem Analysis	PO-c Design/development of solutions	PO-d Conduct investigations of complex problems	PO-e Modern tool usage	PO-f The engineer and society	PO-g Environment and sustainability	PO-h Ethics	PO-i Individual and team work	PO-j Communication	PO-k Project management and finance	PO-l Life-long Learning	PSO-m Honing Domain Knowledge	PSO-n innovation and design	PSO-o Entrepreneurship Skills	PSO-p Ethical values	Learning	Focus on	Assessment Tools to Measure Attainment of CO
CO1	develop web based application using suitable client side and server side web technologies	3	2	2	3	3	3	2	2	3	2	3	3	3	3	3	2	3	3	MSTs, ESE, Class/Quiz Tests
CO2	develop solution to complex problems using appropriate method, technologies, frameworks, web services and content management	3	3	3	3	2	1	1	1	3	2	3	3	3	3	3	2	3	3	MSTs, ESE, Class/Quiz Tests

Department Computer Science and Engineering
Program : B.Tech. (Computer Science and Engineering)

BTCS(612-18UC) Programming in Python Lab

CO No.	CO Statements (Programming in Python Lab)	PO-a	PO-b	PO-c	PO-d	PO-e	PO-f	PO-g	PO-h	PO-i	PO-j	PO-k	PO-l	PSO-m	PSO-n	PSO-o	PSO-p	Learning Level(understand/analyse/ deisgn etc)	Focus on	Assessment Tools to Measure Attainment of CO
CO1	Write, Test and Debug Python Programs	3	3	3	3	3	3	2	1	1	2	2	1	2	1	2		Test and Evaulate	Employab	MSTs, ESE, Class/Quiz Tests
CO2	Implement Conditionals and Loops for Python Programs	3	3	2	3	2	3	2	2	1	1	1	3	2	2	2		Implement	Employab	MSTs, ESE, Class/Quiz Tests
CO3	Use functions and represent Compound data using Lists, Tuples and Dictionaries	3	2	2	3	2	3	2	1	2	1	2	2	3	1	2	1	Apply	Employab	MSTs, ESE, Class/Quiz Tests
CO4	Read and write data from ` & to files in Python and develop Application using Pygame	3	3	3	3	3	3	1	2	1	2	1	2	2	2	2		Design	Employab	MSTs, ESE, Class/Quiz Tests

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Department Computer Science and Engineering

Program : B.Tech. (Computer Science and Engineering)

BTCS :

CO No.	CO Statements	Engineering Knowledge PO-a	Problem Analysis PO-b	Design/development of solutions PO-c	Conduct investigations of complex problems PO-d	Modern tool usage PO-e	The engineer and society PO-f	Environment and sustainability PO-g	Ethics PO-h	Individual and team work PO-i	Communication PO-j	Project management and finance PO-k	Life-long Learning PO-l	Honing Domain Knowledge PSO-m	Innovation and design PSO-n	Entrepreneurship Skills PSO-o	Ethical values PSO-p	Learning	Focus on	Assessment Tools to Measure Attainment of CO
CO1	Describe those aspects of mobile programming that make it unique from programming for other platforms	3	3	3	3	3				2				3	3			design	Employability	
CO2	Critique mobile applications on their design pros and cons	3	3	3	3	3	2			2				3	3			understand	Entrpreneurship	
CO3	Utilize rapid prototyping techniques to design and develop sophisticated mobile interfaces,	3	3	3	2	3	1			2				3	1	2		Apply	Employability	MSTs, ESE, Class/Quiz Tests
CO4	Program mobile applications for the Android operating system that use basic and advanced phone features,	3	3	3	3	3	2			2				3	3	2		Design	Employability	
CO5	Deploy applications to the Android marketplace for distribution	3	3	3	3	3	2			2				3	3	2		Design	Employability	

Department Computer Science and Engineering
Program : B.Tech. (Computer Science and Engineering)
BTCS(type code) Mobile Application Development Lab

CO No.	CO Statements (UC-BTEC-502-18: Digital Signal Processing)	Engineering Knowledge PO-a	Problem Analysis PO-b	Design/development of solutions PO-c	Conduct investigations of complex problems PO-d	Modern tool usage PO-e	The engineer and society PO-f	Environment and sustainability PO-g	Ethics PO-h	Individual and team work PO-i	Communication PO-j	Project management and finance PO-k	Life-long Learning PO-l	Honing Domain Knowledge PSO-m	Innovation and design PSO-n	Entrepreneurship Skills PSO-o	Ethical values PSO-p	Learning	Focus on	Assessment Tools to Measure Attainment of CO
CO1		3	3	3	3	3	2	2	1	3	3	3	3	3	3	3	2			MSTs, ESE, Class/Quiz Tests
CO2		3	3	3	3	3	3	3		3	3	2	3	3	3	3	1			MSTs, ESE, Class/Quiz Tests
CO3		2	1	1	2	1	2	1	1	3	3	1	2	1	2	1	1			MSTs, ESE, Class/Quiz Tests
CO4		3	3	3	3	3	3	3	2	3	3	3	3	3	3	3	2			MSTs, ESE, Class/Quiz Tests

Department Computer Science and Engineering
Program : B.Tech. (Computer Science and Engineering)
BTCS(type code) Internet of Things

CO No.	CO Statements (UC-BTEC-502-18: Digital Signal Processing)	PO-a Engineering Knowledge	PO-b Problem Analysis	PO-c Design/development of solutions	PO-d Conduct investigations of complex problems	PO-e Modern tool usage	PO-f The engineer and society	PO-g Environment and sustainability	PO-h Ethics	PO-i Individual and team work	PO-j Communication	PO-k Project management and finance	PO-l Life-long Learning	PSO-m Honing Domain Knowledge	PSO-n Innovation and design	PSO-o Entrepreneurship Skills	PSO-p Ethical values	Learning	Focus on	Assessment Tools to Measure Attainment of CO
CO1		1	1	1	2	1	1	1		1	3	1	3	2	1	1				MSTs, ESE, Class/Quiz Tests
CO2		3	3	3	3	3	3	2		3	3	2	3	3	2	2	1			MSTs, ESE, Class/Quiz Tests
CO3		3	3	3	3	3	3	1	1	3	3	2	3	3	3	1	1			MSTs, ESE, Class/Quiz Tests
CO4		3	2	2	3	3	3	3		3	1	2	3	3	3	3	1			MSTs, ESE, Class/Quiz Tests

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Department: Computer Science and Engineering
Program : B.Tech. (Computer Science and Engineering)
BTCS : (Computer Graphics Lab)

CO No.	CO Statements	Engineering Knowledge PO-a	Problem Analysis PO-b	Design/development of solutions PO-c	Conduct investigations of complex problems PO-d	Modern tool usage PO-e	The engineer and society PO-f	Environment and sustainability PO-g	Ethics PO-h	Individual and team work PO-i	Communication PO-j	Project management and finance PO-k	Life-long Learning PO-l	Honing Domain Knowledge PSO-m	Innovation and design PSO-n	Entrepreneurship Skills PSO-o	Ethical values PSO-p	Learning Level(understand/analyse / deisgn etc)	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO
CO1	To implement various algorithms to scan, convert the basic geometrical primitives, transformations, Area filling, clipping	3	3	3	3	3	2			2				3	3	2		design	Employability & Entrpreneurship	
CO2	To demonstrate the importance of viewing and projections.	3	3	3	2	3				2				3	2			understand	Entrpreneurship	MSTs, ESE, Class/Quiz Tests
CO3	To apply the fundamentals of animation, virtual reality and its related technologies	3	3	3	3	3				2				3	3	2		Apply	Employability & Entrpreneurship	
CO4	To implement a typical graphics pipeline	3	3	3	3	3				2				3	2			Design	Employability	

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Department : Computer Science and Engineering
Program : B.Tech. (Computer Science and Engineering)
BTCS(type code) : BTCS-505-18 Database Management System Lab

CO No.	CO Statements (UC-BTCS-505-18: Database Management System Lab)	Engineering Knowledge PO-a	Problem Analysis PO-b	Design/development of solutions PO-c	Conduct investigations of complex problems PO-d	Modern tool usage PO-e	The engineer and society PO-f	Environment and sustainability PO-g	Ethics PO-h	Individual and team work PO-i	Communication PO-j	Project management and finance PO-k	Life-long Learning PO-l	Hosing Domain Knowledge PSO-m	Innovation and design PSO-n	Entrepreneurship Skills PSO-o	Ethical values PSO-p	Learning Level(understand/analys e/ deisgn etc)	Focus on Employability / Entrepreneurship	Assessment Tools to Measure Attainment of CO			
CO1	retrieve data from relational databases using SQL	1	3	2	2	1	1	1	1	3	2	3	3	2	2	2	1	Analyse	employability	Practicals		Viva	Assignments
CO2	implement generation of tables using datatypes	1	2	2	2	1	1	1	1	3	3	3	3	2	2	2	1	Design	enterpreneurship	Practicals		Viva	Assignments
CO3	design and execute the various data manipulation queries.	1	2	2	2	1	1	1	1	3	2	3	3	2	2	2	1	Design	employability	Practicals		Viva	Assignments
CO4	execute triggers, cursors, stored procedures etc.	1	3	3	3	2	1	1	1	3	3	3	3	2	2	2	1	Design	enterpreneurship	Practicals		Viva	Assignments

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Department Computer Science and Engineering
Program : B.Tech. (Computer Science and Engineering)
BTCS(506-18) : Software Engineering Lab

CO No.	CO Statements (UC-BTEC-502-18: Digital Signal Processing)	PO-a Engineering Knowledge	PO-b Problem Analysis	PO-c Design/development of solutions	PO-d Conduct investigations of complex problems	PO-e Modern tool usage	PO-f The engineer and society	PO-g Environment and sustainability	PO-h Ethics	PO-i Individual and team work	PO-j Communication	PO-k Project management and finance	PO-l Life-long Learning	PSO-m Honing Domain Knowledge	PSO-n Innovation and design	PSO-o Entrepreneurship Skills	PSO-p Ethical values	Learning	Focus on	Assessment Tools to Measure Attainment of CO
CO1																				MSTs, ESE, Class/Quiz Tests
CO2																				MSTs, ESE, Class/Quiz Tests
CO3																				MSTs, ESE, Class/Quiz Tests
CO4																				

Note * :	CO's are not defined in Syllabus

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Department Computer Science and Engineering
Program : B.Tech. (Computer Science and Engineering)
BTCS(type code) : BTCS 507 -18UC (Computer Network Lab)

CO No.	CO Statements (UC-BTEC-502-18; Digital Signal Processing)	PO-a Engineering Knowledge	PO-b Problem Analysis	PO-c Design/development of solutions	PO-d Conduct investigations of complex problems	PO-e Modern tool usage	PO-f The engineer and society	PO-g Environment and sustainability	PO-h Ethics	PO-I Individual and team work	PO-J Communication	PO-k Project management and finance	PO-l Life-long Learning	PSO-m Honing Domain Knowledge	PSO-n Innovation and design	PSO-o Entrepreneurship Skills	PSO-p Ethical values	Learning	Focus on	Assessment Tools to Measure Attainment of CO
CO1		3	1	3	2	3	3	3	2	2	3	1	3	3	3	2	2	3	3	MSTs, ESE, Class/Quiz Tests
CO2		3		2	2	3	3	3	1	2	3	1	3	3	2	2	1	2	2	MSTs, ESE, Class/Quiz Tests
CO3		3	1	3	1	3	3	3	1	2	3	2	3	3	3	2	1	3	2	MSTs, ESE, Class/Quiz Tests
CO4		3		2	2	3	3	3	1	2	3	3	3	3	2	1	1	3	3	MSTs, ESE, Class/Quiz Tests

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CO No.	CO State	PO-a Engineering Knowledge	PO-b Problem Analysis	PO-c Design/development of solutions	PO-d Conduct investigations of complex problems	PO-e Modern tool usage	PO-f The engineer and society	PO-g Environment and sustainability	PO-h Ethics	PO-i Individual and team work	PO-j Communication	PO-k Project management and finance	PO-l Life-long Learning	PSO-m Honing Domain Knowledge	PSO-n Innovation and design	PSO-o Entrepreneurship Skills	PSO-p Ethical values	Learning	Focus on	Assessment Tools to Measure Attainment of CO
CO1	Understand the major phases of compilation including front-end and back-end.	3	1	1	1	3	2	2		2	1	1	1	2	1			Understar	Employab	MSTs, ESE, Class/Quiz Tests
CO2	Develop the parsers and experiment the knowledge of different parsers design	3	3	3	2	3	3	2	1	3	1	2	2	3	2	3	1	Create	Entrepren	MSTs, ESE, Class/Quiz Tests
CO3	Construct the intermediate code representations and generation	3	2	2	2	2	2	1	1	2		2	2	3	2	2	1	Create	Entrepren	MSTs, ESE, Class/Quiz Tests

CO4	Convert source code for a novel language into machine code for a novel computer	3	3	3	3	3	3	2	1	3	1	1	3	3	3	3	1	Create	Entrepren	MSTs, ESE, Class/Quiz Tests
CO5	Apply for various optimization techniques for dataflow analysis	3	2	1	2	2	3	3		2	2	2	2	2	2	3		Create	Entrepren	MSTs, ESE, Class/Quiz Tests

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Department Computer Science and Engineering
Program : B.Tech. (Computer Science and Engineering)
BTCS(604-18UC) : Compiler Design Lab

CO No.	CO State	PO-a Engineering Knowledge	PO-b Problem Analysis	PO-c Design/development of solutions	PO-d Conduct investigations of complex problems	PO-e Modern tool usage	PO-f The engineer and society	PO-g Environment and sustainability	PO-h Ethics	PO-I Individual and team work	PO-j Communication	PO-k Project management and finance	PO-l Life-long Learning	PSO-m Hosting Domain Knowledge	PSO-n Innovation and design	PSO-o Entrepreneurship Skills	PSO-p Ethical values	Learning Focus on	Assessment Tools to Measure Attainment of CO	
CO1																			MSTs, ESE, Class/Quiz Tests	
CO2																			MSTs, ESE, Class/Quiz Tests	
CO3																			MSTs, ESE, Class/Quiz Tests	
CO4																				

Note * : CO's are not defined in Syllabus

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CO State	PO-a Engineering Knowledge	PO-b Problem Analysis	PO-c Design/development of solutions	PO-d Conduct investigations of complex problems	PO-e Modern tool usage	PO-f The engineer and society	PO-g Environment and sustainability	PO-h Ethics	PO-i Individual and team work	PO-j Communication	PO-k Project management and finance	PO-l Life-long Learning	PSO-m Honing Domain Knowledge	PSO-n Innovation and design	PSO-o Entrepreneurship Skills	PSO-p Ethical values	Learning Focus on	Assessment Tools to Measure Attainment of CO			
																		MSTs, ESE, Class/Quiz Tests			
																		MSTs, ESE, Class/Quiz Tests			
																		MSTs, ESE, Class/Quiz Tests			

CO's are not defined in Syllabus

CO No.	CO State	PO-a Engineering Knowledge	PO-b Problem Analysis	PO-c Design/development of solutions	PO-d Conduct investigations of complex problems	PO-e Modern tool usage	PO-f The engineer and society	PO-g Environment and sustainability	PO-h Ethics	PO-i Individual and team work	PO-j Communication	PO-k Project management and finance	PO-l Life-long Learning	PSO-m Honing Domain Knowledge	PSO-n Innovation and design	PSO-o Entrepreneurship Skills	PSO-p Ethical values	Learning	Focus on	Assessment Tools to Measure Attainment of CO
CO1	Understand different types of AI agents.	3	2	2	2	1	1	1		1	2	2	2	2	1			Understar	Employab	MSTs, ESE, Class/Quiz Tests
CO2	Develop different types of various AI search algorithms.	3	3	3	3	3	2	2	1	2	2	2	3	3	3	3	1	Create	Entrepren	MSTs, ESE, Class/Quiz Tests
CO3	Construct simple knowledge-based systems and to apply knowledge representation.	3	3	3	3	3	2	2		2	2	2	3	3	3	1		Design	Entrepren	MSTs, ESE, Class/Quiz Tests

CO	Description																			
CO4	Convert intermediate representation in contest to understand learning.	3	2	2	2	3	3	2	1	2	3	3	3	3	3	3		Understan	Entrepren	MSTs, ESE, Class/Quiz Tests
CO5	Apply for various techniques for Expert Systems.	3	2	2	3	3	2	2		2	2	3	3	3	3	2		Understan	Entrepren	MSTs, ESE, Class/Quiz Tests

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CO No.	CO Statement	PO-a Engineering Knowledge	PO-b Problem Analysis	PO-c Design/development of solutions	PO-d Conduct investigations of complex problems	PO-e Modern tool usage	PO-f The engineer and society	PO-g Environment and sustainability	PO-h Ethics	PO-i Individual and team work	PO-j Communication	PO-k Project management and finance	PO-l Life-long Learning	PSO-m Honing Domain Knowledge	PSO-n Innovation and design	PSO-o Entrepreneurship Skills	PSO-p Ethical values	Learning	Focus on	Assessment Tools to Measure Attainment of CO
CO1	Explain artificial intelligence, its characteristics and its application areas.	3	2	2	1	2	2	3	2	2	2	2	3	3	3	1	2	Understand	Employab	Practical Assignments
CO2	Formulate real-world problems as state space problems, optimization problems or constraint satisfaction problems.	3	3	3	3	3	2	2	2	3	2	2	3	3	3	3	2	Design	Entrepren	Practical Assignments

CO	Outcome																			
CO3	Select and apply appropriate algorithms and AI techniques to solve complex problems.	3	3	3	3	3	3	2		3.	3	3	3	3	3	3		Design	Entrepren	Practical Assignments
CO4	Design and develop an expert system by using appropriate tools and techniques.	3	3	3	3	3	3	3	2	3	3	3	3	3	3	3	3	Design	Entrepren	Practical Assignments

CO No.	CO Statem	PO-a Engineering Knowledge	PO-b Problem Analysis	PO-c Design/development of solutions	PO-d Conduct investigations of complex problems	PO-e Modern tool usage	PO-f The engineer and society	PO-g Environment and sustainability	PO-h Ethics	PO-i Individual and team work	PO-j Communication	PO-k Project management and finance	PO-l Life-long Learning	PSO-m Honing Domain Knowledge	PSO-n Innovation and design	PSO-o Entrepreneurship Skills	PSO-p Ethical values	Learning	Focus on	Assessment Tools to Measure Attainment of CO
CO1	Explain artificial intelligence, its characteristics and its application areas.	3	2	2	1	2	2	3	2	2	2	2	3	3	3	1	2	Understan	Employab	Practical Assignments
CO2	Formulate real-world problems as state space problems, optimization problems or constraint satisfaction problems.	3	3	3	3	3	2	2	2	3	2	2	3	3	3	3	2	Design	Entrepren	Practical Assignments

CO3	Select and apply appropriate algorithms and AI techniques to solve complex problems.	3	3	3	3	3	3	2		3	3	3	3	3	3	3		Design	Entrepren	Practical Assignments
CO4	Design and develop an expert system by using appropriate tools and techniques.	3	3	3	3	3	3	3	2	3	3	3	3	3	3	3	3	Design	Entrepren	Practical Assignments

Department Computer Science and Engineering
Program : B.Tech. (Computer Science and Engineering)
BTCS(type code) : BTCS BTCS606-18UC (Network Security and Cryptography)

CO No.	CO State	PO-a Engineering Knowledge	PO-b Problem Analysis	PO-c Design/development of solutions	PO-d Conduct investigations of complex problems	PO-e Modern tool usage	PO-f The engineer and society	PO-g Environment and sustainability	PO-h Ethics	PO-i Individual and team work	PO-j Communication	PO-k Project management and finance	PO-l Life-long Learning	PSO-m Honing Domain Knowledge	PSO-n Innovation and design	PSO-o Entrepreneurship Skills	PSO-p Ethical values	Learning	Focus on	Assessment Tools to Measure Attainment of CO
CO1		3	3	2	2	3	3	2	1	2	3		2	3	3	2	1	2	3	MSTs, ESE, Class/Quiz Tests
CO2		3	1	3	3	3	3	3	1	2	3		3	3	2	2	1	2	3	MSTs, ESE, Class/Quiz Tests
CO3		3	2	3	3	3	3	3	1	2	3	1	3	3	3	2	1	2	3	MSTs, ESE, Class/Quiz Tests
CO4		3		3	3	3	3	3	1	2	3		3	3	2	2	1	3	3	MSTs, ESE, Class/Quiz Tests