(A) PROGRAM OUTCOMES

Engineering Graduates will be able to:

PO1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. **Problem analysis**: Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics natural sciences and engineering sciences.

PO3. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified need with appropriate consideration for the public health and safety, and the cultural, societal and environmental considerations.

PO4. **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5. **Modern tool usage**: Create, select and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6. **The engineer and society**: Apply reasoning informed by the background knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7. **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11. **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12. **Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

(B) PROGRAM SPECIFIC OUTCOMES (PSOs)

Students should be able to

PSO1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PSO2. **Problem analysis**: Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics natural sciences and engineering sciences.

PSO3. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified need with appropriate consideration for the public health and safety, and the cultural, societal and environmental considerations.

PSO4. **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

(C) COURSE OUTCOMES (COs)

Department of Computer Engineering

Class:	S.Y.B.TECH
Subject:	Object-Oriented Programming using Java
	Upon Successful completion of this course the student will be able to :
CO-1	Appreciation and understanding of object oriented concepts and their utility.
CO-2	Apply object oriented approach o design software.
CO-3	Formulate the problem come up with object oriented design.
CO-4	Practice use of different features of Object Oriented Methodology like templates, exception handling etc.
CO-5	Study different systems and apply different design methodologies based on the Problem specification and objectives

Class:	S.Y.B.TECH
Subject:	Discrete Mathematics
	Upon Successful completion of this course the student will be able to :
CO-1	Model logic statements arising in algorithm correctness and real-life situations and manipulate them using the formal methods of propositional and predicate logic.
CO-2	Calculate the principles of Set theory, Cardinality and discrete probability. Also understand the principles of Relations and Functions, Recurrence relation, graph theory, trees etc.
CO-3	Understand fundamental mathematical concepts as they apply to computer science by seeing how mathematics supports CS, and how CS concepts can be formalized in mathematics Illustrate by examples.
CO-4	Remember the basic terminology of functions, relations, and sets and demonstrate knowledge of their associated operations.
CO-5	Relate the ideas of mathematical induction to recursion and recursively defined structures.
CO-6	Establish and solve recurrence relations that arise in counting problems including the problem of determining the time complexity of recursively defined algorithms.

Department of Electronics & Telecommunication

Class:	T.Y.B.TECH
Subject:	Electromagnetic Field Theory
	At the end of this course students will demonstrate the ability to:
CO-1	Understand characteristics and wave propagation on high frequency transmission lines
CO-2	Carryout impedance transformation on TL
CO-3	Use sections of transmission line sections for realizing circuit elements
CO-4	Characterize uniform plane wave
CO-5	Calculate reflection and transmission of waves at media interface
CO-6	Analyze wave propagation on metallic waveguides in modal form
CO-7	Understand principle of radiation and radiation characteristics of an antenna

Class:	T.Y.B.TECH
Subject:	Digital Signal Processing
	At the end of this course students will demonstrate the ability to :
CO-1	Understand use of different transforms and analyze the discrete time signals and systems
CO-2	Realize the use of LTI filters for filtering different real world signals.
CO-3	Capable of calibrating and resolving different frequencies existing in any signal
CO-4	Design and implement multistage sampling rate converter.
CO-5	Design of different types of digital filters for various applications.

Department of Mechanical Engineering

Class:	T.Y.B.TECH
Subject:	Heat Transfer(BTMEC501)
	At the end of the course, students will be able to:
CO1	Explain the laws of heat transfer and deduce the general heat conduction equation and to explain it for 1-D steady state heat transfer in regular shape bodies
CO2	Describe the critical radius of insulation, overall heat transfer coefficient, thermal conductivity and lumped heat transfer
CO3	Interpret the extended surfaces
CO4	Illustrate the boundary layer concept, dimensional analysis, forced and free convection under different conditions
CO5	Describe the Boiling heat transfer, mass transfer and Evaluate the heat exchanger and examine the LMTD and NTU methods applied to engineering problems
CO6	Explain the thermal radiation black body, emissivity and reflectivity and evaluation of view factor and radiation shields

Class:	T.Y.B.TECH
Subject:	Machine Design-II(BTMEC602)
	At the end of the course, students will be able to:
CO1	Define function of bearing and classify bearings
CO2	Understanding failure of bearing and their influence on its selection.
CO3	Classify the friction clutches and brakes and decide the torque capacity and friction disk parameter.
CO4	Select materials and configuration for machine element like gears, belts and chain
CO5	Design of elements like gears, belts and chain for given power rating
CO6	Design thickness of pressure vessel using thick and thin criteria

Department of Civil Engineering

Class:	S.Y.B.TECH
Subject:	Mechanics of Solids (BTCVC302)
	On completion of the course, the students will be able to
CO-1	Compute different type of stresses in determinate, homogeneous and composite structures
CO-2	Develop bending and shear stress diagram
CO-3	Determine the torsional stresses and stresses due to strain energy for different loading conditions
CO-4	Explain the concept of principal stresses due to combined loading and able to compare the values of analytical and graphical (Mohr's circle) method
CO-5	Plot loading diagram, Shear Force Diagram (SFD) and Bending Moment Diagram (BMD).
CO-6	Analyze axially and eccentrically loaded column

Class:	T.Y.B.TECH
Subject:	Design of Steel Structures (BTCVC 501)
	On completion of the course, the students will be able to
CO-1	Identify and compute the design loads and the stresses developed in the steel member
CO-2	Analyze and design the various connections and identify the potential failure modes
CO-3	Analyze and design various tension, compression and flexural members
CO-4	Understand provisions in relevant BIS Codes

Department of Electrical Engineering

Class:	T.Y.B.TECH
Subject:	Control System-I
	At the end of this course students will demonstrate the ability to
CO-1	To understand the behavior of nonlinear control system.
CO-2	To design and analyze PID controller.
CO-3	To understand and analyze state variable technique.
CO-4	To design and analyze suitable control system for engineering application.

Class:	T.Y.B.TECH
Subject:	Principles of Electric Machine Design
	At the end of this course students will demonstrate the ability to
CO-1	To understand principles of electric machine design.
CO-2	To design different components of electric machine.
CO-3	To design Transformer
CO-4	To understand CAD and use it for transformer design

Department of Applied Science

Class:	F.Y.B.TECH
Subject:	Engineering Chemistry
	After successful completion of this course the student will be able to:
CO-1	Design and conduct experiments, analyze and interpret data.
CO-2	Design a component, system or process to meet desired needs within realistic constraints and ability to function on multidisciplinary terms.
CO-3	Identify, formulate and solve problems.
CO-4	Understand the impact of engineering solutions in global, economic, environmental and societal context.
CO-5	Ability to appreciate contemporary issues and engages in life long learning.
CO-6	Use the latest techniques, skills and modern tools necessary for engineering practices.
CO-7	Understanding of the necessity to quantitatively balanced the built environment with the natural world.
CO-8	Understanding the basic parameters of water, different water softening processes and effect of hard water in industries.
CO-9	Understanding the preparation, basic properties and applications of various metals and their alloys as engineering material.
CO-10	Understand the preparation, basic properties and applications of lubricants.
CO-11	Understand the synthesis, various properties and applications of fuels as engineering materials.
CO-12	Understand the classification, preparation, properties and applications of different engineering materials.

Class:	F.Y.B.TECH
Subject:	Engineering Physics
	After successful completion of this course the student will be able to:
CO-1	Differentiate between different types of oscillations and derive their differential equations.
CO-2	Describe the production of ultrasonic wave by different methods and its applications.
CO-3	Define the terms of optics and explain the different types of polarizations in dielectric materials.
CO-4	Calculate different parameters of optical system by using Newton ring experiment.
CO-5	Describe the different methods for the production of plane polarize light.
CO-6	Explain the basic structure of OFC and calculate its different parameters.

CO-7	Describe the principle of production of X-rays and different types of laser.
CO-8	Calculate the specific charge (e/m) of an electron by Thomson and Millikan's oil drop experiment.
CO-9	Derive the mathematical relation for Schrodinger time independent and dependent equations.
CO-10	Solve the basic problems on cubical crystal structure for the calculation of different structural parameters.
CO-11	Draw the planes in cubical structure as per given Miller indices and calculate Miller indices from given planes.
CO-12	Describe the basic phenomenon in magnetic and semiconducting materials and its applications in engineering.