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- The institution is adopting well-structured outcome-based education (OBE) system by actively involving all the stakeholders (students, teachers, employers and alumni). The institute offers a number of courses/programmes, at undergraduate levels which are affiliated to DBATU, Lonere. The institute uses different mechanism and practices to communicate course outcomes and program outcomes to all stakeholders. The programme outcome (PO) and course outcome (CO)of all programmes and courses are made available explicitly on the institute website.
- The POs and COs are disseminated to all the concerned faculty as well as students through the following means of communication:
  - Website
  - Course file of each course
  - Departmental display boards
  - Academic Diary

A.Y. 2022-23

PROGRAM OUTCOMES (PO'S), PROGRAM SPECIFIC OUTCOMES AND PROGRAM EDUCATIONAL OBJECTIVES

(PSO's) and (PEO's) FOR ALL PROGRAMS

(UG)

Name of the Department- Artificial Intelligence and Data Science

Program Outcomes (PO's)

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

Program Specific Outcomes (PSO's)

Program-Specific Outcomes (PSOs)	
PSO 1	Apply the fundamentals of science, mathematics and engineering knowledge to design, development, formulates and investigate complex engineering problems Related to application area in Artificial Intelligence and Data Science.
PSO 2	Provide exposure to latest tools and technologies and aware of the impact of Professional engineering solution in environmental, societal, professional ethicsand able to communicate effectively.
PSO3	To publish research paper and think, innovates in artificial intelligence, machine Learning and Data Science domain

Program Educational Objectives (PEO's)

Objective, Identifier	**Objectives**
PEO1	To equip graduates with a strong foundation in engineering sciences and Artificial Intelligence and Data Science Engineering fundamentals to become effective collaborators, researchers and real-time problem solver with technical competencies.
PEO2	Perceive the limitation and impact of engineering solutions in social, legal, environmental, economic and multidisciplinary contexts.
PEO3	Excel in Industry/technical profession, higher studies, and entrepreneurship exhibiting global competitiveness

Name of the Department- Civil Engineering

Program Outcomes (PO's)

Level	Description
PO1	**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	**Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	**Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
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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.

Program Specific Outcomes (PSO's)

PSO1	Make the students employable in engineering industries.
PSO2	Motivate the students for higher studies and research.
PSO3	Motivate the students for various competitive examinations

Program Educational Objectives (PEO's)

PEO1	Taking pride in their profession and have commitment to highest standards of ethical practices and related technical disciplines.
PEO2	Able to design various structures and systems that is safe, economical and efficient.
PEO3	Capable of using modern tools efficiently in all aspects of professional practices.
PEO4	Dealing successfully with real life civil engineering problems and achieve practical solutions basedon a sound science and engineering knowledge.
PEO5	Shall be engage in continuous research, development and exchange of knowledge for professional development.

Name of the Department- Computer Science & Engineering

Program Outcomes (PO's)

Outcome Identifier	Outcomes
PO1	The graduates will possess the knowledge of various discrete mathematical structures, Logic and numerical techniques.
PO2	The graduates will have an ability to apply mathematical formalism of Finite Automata and Probability in modeling and analysis of systems.
PO3	The graduates will have knowledge of core programming paradigms such as database orientation, object orientation, and agent orientation and concepts essential to implement software based system.
PO4	The graduates will have an ability to analyze problem, specify algorithmic solutions to them and to evaluate alternative solutions.
PO5	The graduate will have broad understanding of the impact of a computer based solutions in economic, environmental and social context and will demonstrate use of analytical tools in gathering requirements and distilling relevant information to provide computer based solutions.
PO6	The graduates will demonstrate the ability to build human centric interfaces to computers.
PO7	The graduates will posses the knowledge of advanced and emerging topics in the fields of operating systems, databases and computer networks.
PO8	The graduates will posses skills necessary to communicate design engineering ideas. The skills set include verbal, written and listening skills.
PO9	The graduates will understand ethical issues in providing computer based solutions also they will have an ability and attitude to address the ethical issues.
PO10	The graduates will understand the role of system software such as operating systems, database management systems, compilers, middle-ware and internet protocols in realizing distributed information environment

Program Specific Outcome (PSO's)

Outcome Identifier	Outcomes
PSO1	Ability to understand basics of computer system hardware and peripherals.
PSO2	Ability to install and use open source operating system, application software and use of FLOSS tools.
PSO3	Ability to solve, analyze and provide meaningful insights for data analytic problems.

Program Educational Objectives (PEO's)

Objective, Identifier	Objectives
PEO1	To provide knowledge of sound mathematical principles underlying various programming concepts.
PEO2	To develop an ability to understand complex issues in the analysis, design, implementation and operation of information systems.
PEO3	To provide knowledge of mechanisms for building large-scale computer-based systems.
PEO4	To develop an ability to provide computer-based solutions to the problems from other disciplines of science and engineering.
PEO5	To impart skills necessary for adapting rapid changes taking place in the field of information and communication technologies.
PEO6	To provide knowledge of ethical issues arising due to deployment of information and communication technologies in the society on large scale.

Name of the Department- Electronics & Telecommunication Engineering

Program Outcomes (PO's)

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

Program Specific Outcome (PSO's)

PSO1	Apply basic knowledge related to electronic circuits, embedded & wireless communication systems and signal processing to solve engineering/ societal problems in the field of electronics and telecommunication engineering.
PSO2	recognize and adapt to technical developments and to engage in lifelong learning And develop consciousness for professional, social, legal and ethical Responsibilities.
PSO3	Excellent adaptability to the changing industrial and real world requirements

Program Educational Objectives (PEO's)

PEO1	To prepare students to give good theoretical background with sound practical knowledge, enable them to analyze and solve Electronics and Telecommunication Engineering problems by applying basic principles of mathematics, science and engineering using modern tools and techniques.
PEO2	To make students to test hardware components and software for offering solution to real life situations.
PEO3	To inculcate students to be sensitive to ethical, societal and environmental issues while pursuing their professional duties.
PEO4	To build strong fundamental knowledge amongst students to pursue higher education and to enhance research and continue professional development in Electronics, Communication and IT industries with attitude for lifelong learning.
PEO5	To nurture students with technical and communication skills in order to be able to function on multidisciplinary fields and make them aware of contemporary issues at national and international levels.
PEO6	To develop students for team-works and managerial skills leading to entrepreneurship and leadership.

Name of the Department- Electrical Engineering

Program Outcomes (PO's)

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

Program Specific Outcome (PSO's)

PSO 1	Make the students employable in engineering industries.
PSO 2	Motivate the students for higher studies and research.

Program Educational Objectives (PEO's)

PEO1	Will exhibit strong technical ability and creativity to formulate alternative solutions to various electrical Engineering problems with available resources.
PEO2	Will demonstrate good interpersonal communication, team spirit and leadership in their profession.
PEO3	Will follow ethical approach and engage them in lifelong learning to meet societal needs and global challenges.
PEO4	Will exhibit industry ready abilities and skills.

Name of the Department- Mechanical Engineering

Program Outcomes (PO's)

PO 1	Apply the knowledge of mathematics, basic sciences, and mechanical engineering to the solution of complex engineering problems.
PO 2	Identify, formulate, research literature, and analyze complex mechanical engineering problems reaching substantiated conclusions.
PO 3	Design solutions for complex engineering problems and design mechanical system components that meet the specified needs.
PO 4	Use mechanical engineering research-based knowledge related to interpretation of data and provides valid conclusions.
PO 5	Create, select, and apply modern mechanical engineering and IT tools to complex engineering activities with an understanding of the limitations.
PO 6	Apply reasoning acquired by the mechanical engineering knowledge to assess societal and safety issues.
PO 7	Understand the impact of engineering solutions on the environment, and demonstrate the knowledge for sustainable development.
PO 8	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	Communicate effectively on complex engineering activities with the engineering community and with society at large.
PO 11	Understand the engineering and management principles and apply these to the multidisciplinary environments.
PO 12	Recognize the need for life-long learning in the broadest context of technological change.

Program Specific Outcome (PSO's)

PSO 1	Make the students employable in engineering industries.
PSO 2	Motivate the students for higher studies and research.

Program Educational Objectives (PEO's)

PEO 1	Graduates should excel in engineering positions in industry and other organizations that emphasize design and implementation of engineering systems and devices.
PEO 2	Graduates should excel in best post-graduate engineering institutes, acquiring advanced degrees in engineering and related disciplines.
PEO 3	Alumni should establish a successful career in an engineering-related field and adapt to changing technologies.
PEO 4	Graduates are expected to continue personal development through professional study and self-learning.
PEO 5	Graduates should be good citizens and cultured human beings, with full appreciation of the importance of professional, ethical and societal responsibilities.

A.Y. 2022-23

COURSE OUTCOMES FOR ALL PROGRAMMES

(CO's)

(UG)

Name of the Department- Artificial Intelligence and Data Science

Course Outcomes (COs)

SEMETER-III **(S.Y.-I)**

Sr. No.	Subject Name	Course Outcomes
1)	**Engineering Mathematics-III** **(BTES301)**	1. Understand the concept of vector calculus. 2. Solve problems related to matrices and applications to Deep Learning, Signal & Image processing. 3. Understand the concepts of linear algebra and apply Linear Programming, Computer Graphics and Cryptography. 4. Understand the concepts of determinant and apply it in data analysis. 5. Analyze Diagonalization and apply in Graphs and Networks, Matrices in Engineering, Markov Matrices, Population, and Economics.
2)	**An Introduction to Artificial Intelligence** **(BTAIC302)**	1. Discuss Meaning, Scope anStages of Artificial Intelligence 2. Understand and Implement Problem Space and Search Strategies for Solving problems. 3. Discuss the Search Techniques and Knowledge Representation. 4. Apply search for solving Constraint Satisfaction Problems and Game-playing. 5. Discover the Application of Artificial Intelligence and Analyze Impact of AI on Society.

3)	**Data Structure and Algorithm Using Python (BTAIC303)**	1. Write programs using basic concepts of Python Programming 2. Implement algorithms for arrays, linked structures, stacks, queues, trees, and graphs 3. Write programs that use arrays, linked structures, stacks, queues, trees, and graphs 4. Compare and contrast the benefits of dynamic and static data structures implementation 5. Discuss the computational efficiency of the principal algorithms for sorting, searching, and hashing
4)	**Computer Architecture and Operation Systems (BTESC304)**	1. Understand the theory and architecture of central processing unit & Analyze some of the design issuesin terms of speed, technology, cost, performance 2. Use appropriate tools to design verify and test the CPU architecture & Learn the concepts of parallelprocessing, pipelining and inter processor communication. 3. Understand the architecture and functionality of central processing unit & Exemplify in a better waythe I/O and memory organization, Memory management systems, Virtual Memory 4. Describe and explain the fundamental components of a computer operating system 5. Define, restate, discuss, and explain the policies for scheduling, deadlocks, memory management,synchronization, system calls, and file systems.

5)	**Digital Logic & Signal Processing (BTESC305)**	1. Use the basic logic gates and various reduction techniques of digital logic circuit in detail 2. Understand mathematical description and representation of various signals and systems. 3. Develop input output relationship for linear shift invariant system and understand the 4. convolution operator for discrete time system. 5. Understand use of different transforms and analyze the discrete time signals and systems. 6. Understand the concept of correlation, regression and spectral density.

SEMETER-IV **(S.Y.-II)**

Sr. No.	Subject Name	Course Outcomes
1)	**Data Analysis (BTAIC401)**	1. Apply preprocessing techniques to convert raw data so as to enable further analysis. Apply exploratory data analysis and create insightful visualizations to identify patterns. 2. Understand how to derive the probability density function of transformations of random variables and use these techniques to generate data from various distributions. 3. Understand the statistical foundations of data science and analyze the degree of certainty of predictions using statistical test and models 4. Introduce machine learning algorithms for prediction and to derive insights

2)	**Database Management System (BTAIC402)**	1. Master the basic concepts of relational DBMS and its types. 2. Perform various types of operations on relational databases using DDL, DML, DCLin SQL 3. Understand the concept of how non-relational databases differ from relational databases from a practical perspective. 4. Master the basic concepts of designing NoSQL database management system. 5. Able to Identify what type of NoSQL database to implement based on business requirement
3)	**Basic Human Rights (BTHM403)**	1. Students will be able to understand the history of human rights. 2. Students will learn to respect others caste, religion, region and culture. 3. Students will be aware of their rights as Indian citizen. 4. Students will be able to understand the importance of groups and communities in the society. 5. Students will be able to realize the philosophical and cultural basis and historical perspectives of human rights
4)	**Probability Theory and Random Processes (BTBS404)**	1. Understand the fundamental knowledge of the concepts of probability and have knowledge of standard distributions which can describe real life phenomenon 2. Understand the basic concepts of one and two dimensional random variables and apply in engineering applications 3. Apply the concept random processes in engineering disciplines 4. Understand and apply the concept of correlation and spectral densities

		5. The students will have an exposure of various distribution functions and help in acquiring skills in handling situations involving more than one variable. Able to analyze the response of random inputs to linear time invariant systems
5)	**Programming in JAVA (BTETC701)**	1. To understand basics of JAVA 2. To use Packages & interfaces 3. To apply Exception Handling & Multithreaded Programming 4. To acquire Java Database Connectivity 5. To recognize Applet, Event Handling and AWT

Name of the Department- Civil Engineering

Course Outcomes (COs)

Semester: III **(SY-I)**

Sr. No.	Subject Name	Course Outcomes
1)	**Mathematics – III (BTBS301)**	1. On completion of the course, student will be able to formulate. 2. Solve mathematical model of civil engineering phenomena in field of structures, survey, fluid mechanics and soil mechanics.
2)	**Mechanics of Solids (BTCVES302)**	1. Perform the stress-strain analysis. 2. Draw force distribution diagrams for members and determinate beams. 3. Visualize force deformation behavior of bodies. 4. Perform failure analysis
3)	**Building Construction & Drawing: (BTCVC303)**	1. Understand types of masonry structures. 2. Comprehend components of building and there purposes 3. Draw plan, elevation and section of various structures. 4. Apply the principles of planning and by laws used for building planning. 5. Prepare detailed working drawing for doors and windows.

4)	**Hydraulics – I: (BTCVC304)**	1. Calibrate the various flow measuring devices. 2. Determine the properties of fluid and pressure and their measurement. 3. Understand fundamentals of pipe flow, losses in pipe and analysis of pipe network. 4. Visualize fluid flow phenomena observed in Civil Engineering systems.
5)	**Surveying: (BTCVC305)**	1. Perform measurements in linear/angular methods. 2. Perform plane table surveying in general terrain. 3. Know the basics of leveling and Theodolite survey in elevation and angular measurements
6)	**Solid Mechanics Laboratory: (BTCVL307)**	1. Evaluate Young Modulus, torsional strength, hardness and tensile strength of given specimens. 2. Determine the strength of coarse aggregates. 3. Find the compressive strength of concrete cubes and bricks. 4. Determine physical properties of given coarse aggregates, fine aggregates and cement samples.
7)	**Hydraulics- I Laboratory : (BTCVL308)**	1. Analyze the properties of fluids and their verification. 2. Predict empirical behavior of fluids. 3. Apply principles of hydraulics while working in field

8)	**Surveying Laboratory: (BTCVL309)**	1. Use the theodolite along with chain/tape, compass on the field. 2. Apply geometric and trigonometric principles of basic surveying calculations. 3. Plan a survey, taking accurate measurements, field booking, and adjustment of errors. 4. Apply field procedures in basic types of surveys, as part of a surveying team. 5. Employ drawing techniques in the development of a topographic map.
SEMETER-IV		**(S.Y.-II)**
1)	**Building Planning and Drawing (BTCVC 401)**	1. To plan buildings considering various principles of planning and byelaw of governing body. 2. Comprehend various utility requirements in buildings 3. Understand various techniques for good acoustics.
2)	**Environmental Engineering: (BTCVC402)**	1. Apply the water treatment concept and methods. 2. Prepare basic process designs of water and wastewater treatment plants. 3. Apply the wastewater treatment concept and methods. 4. Apply the solid waste management concepts.

3)	**Structural Mechanics– I: (BTCVC403)**	1. Describe the concept of structural analysis, degree of indeterminacy. 2. Calculate slopes and deflection at various locations for different types of beams. 3. Identify determinate and indeterminate trusses and calculate forces in the members of trusses Perform the distribution of the moments the in continuous beam and frame
4)	**Water Resources Engineering: (BTCVC404)**	1. Understand need of Irrigation in India and water requirement as per farming practice in India. 2. Understand various irrigation structures and schemes. 3. Develop basis for design of irrigation schemes.
4)	**Hydraulics-II: (BTCVC 405)**	1. Design open channel sections in a most economical way. 2. Know about the non-uniform flows in open channel and the characteristics of hydraulic jump. 3. Understand application of momentum principle of impact of jets on plane
5)	**Engineering Geology (BTCVC406)**	1. Recognize the different land forms which are formed by various geological agents. 2. Identify the origin, texture and structure of various rocks and physical properties of mineral. 3. Emphasize distinct geological structures which have influence on the civil engineering structure. 4. Understand how the various geological conditions affect the design parameters of structures.

6)	**Building Planning and CAD Lab: (BTCVL407)**	1. On completion of the course, the students will be able to: Draw plan, elevation and section of load bearing and framed structures. Draw plan, elevation and section of public structures.
7)	**Environmental Engineering Laboratory: (BTCVL408)**	1. Quantify the pollutant concentration in water, wastewater and ambient air. 2. Recommend the degree of treatment required for the water and wastewater. 3. Analyze the survival conditions for the microorganism and its growth rate
8)	**Hydraulic Engineering Laboratory – II: (BTCVL409)**	1. Understand various properties of fluids and measurement techniques. 2. Carry out calibrations of various flow measuring devices. 3. Understand mechanism of hydraulic jump, various jets and pump
SEMETER-V		**(T.Y.-I)**
1)	**Design of Steel Structures: (BTCVC501)**	1. Identify and compute the design loads and the stresses developed in the steel member. 2. Analyze and design the various connections and identify the potential failure modes. 3. Analyze and design various tension, compression and flexural members. 4. Understand provisions in relevant BIS Codes

2)	**Geotechnical Engineering: (BTCVC502)**	1. Understand different soil properties and behavior 2. Understand stresses in soil and permeability and seepage aspects. 3. Develop ability to take up soil design of various foundations
3)	**Structural Mechanics –II: (BTCVC503)**	1. Have a basic understanding of matrix method of analysis and will be able to analyze the determinant structure. 2. Have a basic understanding of the principles and concepts related to finite difference and finite element methods 3. Have a basic understanding of concept of influence line
4)	**Concrete Technology: (BTCVC504)**	1. Understand the various types and properties of ingredients of concrete. 2. Understand effect of admixtures on the behavior of the fresh and hardened concrete. 3. Formulate concrete design mix for various grades of concrete.
5)	**Project Management: (BTHM505)**	1. On completion of the course, the students will be able to: Understand various steps in project Management, different types of charts. 2. Construct network by using CPM and PERT method. Determine the optimum duration of project with the help of various time estimates. 3. Know the concept of engineering economics, economic comparisons, and linear break even analysis problems. Understand the concept of total quality Management including Juran and Deming's philosophy

6)	**A. Advanced Environmental Engineering: (BTCVPE 506)**	1. Determine the sewage characteristics and design various sewage treatment plants. 2. Understand municipal water and wastewater treatment system design and operation. 3. Apply environmental treatment technologies and design processes for treatment of industrial waste water. 4. Understand the rural sanitation schemes.
7)	**Software Applications in Civil Engineering: (BTCVES507)**	1. Understand & Analyses civil engineering software 2. Use applications of various software in specialized works of civil engineering
8)	**G. Materials, Testing &Evaluation: (BTCVPE506)**	1. To develop skill to construct strong and durable structures by applying knowledge of material science. 2. To make the students aware of quality assurance and control in their real life as a professional. 3. To propose suitable material in adverse condition
9)	**SDD of Steel Structures Lab: (BTCVL508)**	1. Simulate a practical design requirement in to a theoretical statement to solve mathematically to arrive at a safe economical and realistic feasible solution that can be executed.
10)	**Geotechnical Engineering Lab: (BTCVL509)**	1. Determine different engineering properties of soil. 2. Identify and classify soils based on standard geotechnical engineering practices. 3. Perform Laboratory oratory compaction and in-place density tests. 4. Perform and interpret direct shear tests and estimate shear strength parameters.
SEMETER-VI		**(T.Y.-II)**

1)	**Design of RC Structures: (BTCVC 601)**	1. On completion of the course, the students will be able to comprehend the various design philosophies used in design of reinforced concrete. 2. Analyze and design the reinforced concrete sections using working stress and limit state method.
2)	**Foundation Engineering: (BTCVC 602)**	1. To predict soil behavior under the application of loads and come up with appropriate solutions to foundation design queries 2. Analyze the stability of slope by theoretical and graphical methods. Analyze the results of in-situ tests and transform measurements and associated uncertainties into relevant design parameters. 3. Synthesize the concepts of allowable stress design, appropriate factors of safety, margin of safety, and reliability.
3)	**Transportation Engineering: (BTCVC603)**	1. On completion of the course, the students will be able to: Comprehend various types of transportation systems and 2. Their history of the development Comprehend to various types of pavements 3. Design the pavements by considering various aspects associated with traffic safety measures.

4)	**Structural Audit: (BTCVPE604)**	1. Gain the knowledge of Bye laws, procedure of Structural audit and study the typical problems in structures. 2. Aware of causes and types of deterioration in structures. 3. Develop skills for use of various Nondestructive tests required during auditing of structures 4. Strength evaluation of existing structures 5. Acquire knowledge of legal procedure to conduct structural audits. 6. Prepare a Structural audit report
5)	**Operation Research (BTCVOE605)**	1. Adopt Operation Research tools and techniques while working in industry 2. Analyze the problem statement with computational approach 3. Apply various models to propose suitable outcomes 4. Apply various decision-making tools to propose best suitable alternatives, at large.
6)	**Indian Constitution (BTHM606)**	1. Universal declaration of Human Rights and Provisions of India, Constitution and Law, National Human Rights Commission and State Human Rights Commission
7)	**SDD of RC Structures Lab (BTCVL607)**	1. Able to be shall consist of detailed analytical report for structural design and drawing of the following RC structures 2. The introduction, analysis and design of these topics shall be studied in self-study mode. If required the subject teacher should address the student's queries during tutorials
8)	**Transportation Engineering Lab: (BTCVL608)**	1. On completion of the course, the students will be able to: Perform tests on various road construction materials. 2. Perform CBR tests on local soils to determine subgrade properties needed for road ways.

9)	**Mini Project (BTCVM609)**	1. Student shall choose a topic of his interest in consultation with faculty in the department. The topic for mini project may be related to Civil Engineering area and/or interdisciplinary area. Student shall attempt to collect necessary information and present a summary indicating comprehension of the topic and acquired depth of knowledge. 2. It is desirable to obtain industry or community sponsorship. Simplified tools or devices may be presented in form of working model and a brief report stating development. A power point presentation shall also be submitted.
SEMETER-VII		**(B.Tech-I)**
1)	**Design of Concrete Structures – II: (BTCVC701)**	1. Able to identify the behavior, analyze and design of the beam sections subjected to torsion. 2. Able to analyze and design of axially and eccentrically loaded column and construct the interaction diagram for them. 3. Understand various concepts, systems and losses in pre-stressing. 4. Able to analyze and design the rectangular and symmetrical I-section pre-stressed beam/girders.
2)	**Infrastructure Engineering (BTCVC702)**	1. Know about the basics and design of various components of railway engineering 2. Understand the types and functions of tracks, junctions and railway stations. 3. Know about the aircraft characteristics, planning and components of airport 4. Understand the types and components of docks and harbors
3)	**Water Resources Engineering (BTCVC703)**	1. Understand need of Irrigation in India and water requirement as per farming practice in India. 2. Understand various irrigation structures and schemes. 3. Develop basis for design of irrigation schemes.

4)	**Professional Practices: (BTCVC704)**	1. Understand the importance of preparing the types of estimates under different conditions for various structures. 2. Know about the rate analysis and bill preparations and to study about the specification writing. 3. Know the various types of contract, accounts in PWD, methods for initiating the works in PWD and tendering. 4. Understand the valuation of land and buildings, various methods and factors affecting valuation.
5)	**Construction Techniques (BTCVE705A)**	1. Understand the planning of new project with site accessibility and services required. 2. Comprehend the various civil construction equipment's. 3. Familiar with layout of RMC plant, production, capacity and operation process. 4. Recognize various aspect of road construction, construction of diaphragm walls, railway track construction etc.
6)	**Town and Urban Planning: (BTCVOE706E)**	1. Understand town and Urban planning and their essential attributes 2. Identify elements of planning and regulations of the same 3. Implement guidelines provided by standard authorities
7)	**Design Drawing of RC & Steel Structures (BTCVL707)**	1. On completion of the course, student will be able to simulate a practical design requirement in to a theoretical statement to solve mathematically to arrive at a safe economical and realistic feasible solution that can be executed.

Name of the Department- Computer Science & Engineering

Course Outcomes (COs)

SEMETER-III **(S.Y.-I)**

Sr. No.	Subject Name	Course Outcomes
1)	**ENGINEERING MATHEMATICS-III (BTBS301)**	1. Solve higher order linear differential equation using appropriate techniques for modeling and analyzing electrical circuits. 2. Solve problems related to Fourier transform, Laplace transform and applications to Communication systems and Signal processing. 3. Obtain Interpolating polynomials, numerically differentiate and integrate functions, numerical solutions of differential equations using single step and multi-step iterative methods used in modern scientific computing. 4. Perform vector differentiation and integration, analyze the vector fields and apply to Electromagnetic fields. 5. Analyze conformal mappings, transformations and perform contour integration of complex functions in the study of electrostatics and signal processing.
2)	**DISCRETE MATHEMATICS (BTCOC302)**	1. To study basic connectives, equivalent formulas and normal forms 2. To understand set theory and relations with example 3. To understand function and types of function through example 4. To make student understand definition and types of algebraic systems, Boolean algebra and their application
3)	**DATA STRUCTURES (BTCOC303)**	1. Classify different data structures such as stack, queues, linked list, trees and graphs 2. Analyze and implement various searching and sorting techniques 3. Implement linear and non-linear data structures 4. Apply appropriate data structures to solve specific problems
4)	**COMPUTER ARCHITECTURE & ORGANIZATION (BTCOC304)**	1. To understand the basic hardware and software issues of computer organization. 2. Identify functional units, bus structure and addressing modes.

		3. Students will be able to identify where, when and how enhancements of computer performance can be accomplished. 4. Students will also be introduced to more recent applications of computer organization in advanced digital systems. 5. Identify memory hierarchy and performance.
5)	**OBJECT ORIENTED PROGRAMMING IN JAVA (BTCOC305B)**	1. The basic object oriented programming concepts and apply them in problem solving 2. Illustrate inheritance concepts for reusing the program. 3. Demonstrate on the multi-tasking by using multiple threads 4. Develop data-centric applications using JDBC. 5. Evaluate the basics of java console and GUI based programming

SEMETER-IV **(S.Y.-II)**

Sr. No.	Subject Name	Course Outcomes
1)	**DESIGN & ANALYSIS OF ALGORITHMS (BTCOC401)**	1. Describe the major modern algorithms and selected techniques that are essential to today's computers 2. Identify the key characteristics of a given problem and analyze the suitability of a specific algorithm design technique for the problem. (knowledge, application (level 1, level 3)) 3. Describe, apply and analyze the complexity of certain divide and conquer, greedy and dynamic programming algorithm.(knowledge, application (level 1, level 3). 4. Analyze NP-complete problems and develop algorithms to solve the problems.
2)	**OPERATING SYSTEMS (BTCOC403)**	1. Explain the basic concepts, types, and system components of OS 2. Illustrate and compare the performance of process scheduling techniques 3. Apply the knowledge of process management, synchronization, deadlock to solve basic problems. 4. Analyze various memory management techniques. 5. Exemplify i/o management and file systems

3)	**BASIC HUMAN RIGHTS (BTHM403)**	1. Students will be able to understand the history of human rights. 2. Students will learn to respect others caste, religion, region and culture. 3. Students will be aware of their rights as Indian citizen. 4. Students will be able to understand the importance of groups and communities in the society. 5. Students will be able to realize the philosophical and cultural basis and historical perspectives of human rights.
4)	**PROBABILITY THEORY AND RANDOM PROCESSES (BTBS404)**	1. Understand representation of random signals 2. Investigate characteristics of random processes 3. Make use of theorems related to random signals 4. To understand propagation of random signals in LTI systems
5)	**DIGITAL LOGIC DESIGN & MICROPROCESSORS (BTES405)**	1. Understand various types of number systems and their conversions. 2. Simplify the Boolean expressions and apply the Boolean theorems through logical gates 3. Design and implement variety of logical devices using combinational circuit's concepts. 4. Demonstrate and compare the construction of programmable logic devices and different types of ROM 5. Analyze sequential circuits like Registers and Counters using flip-flops.

SEMETER-V **(T.Y.-I)**

Sr. No.	Subject Name	Course Outcomes
1)	**DATABASE SYSTEMS (BTCOC501)**	1. Model, design and normalize databases for real life applications. 2. To learn data models, conceptualize and depict a database system using ER diagram. 3. Query database applications using query languages like sql. 4. Understand validation framework like integrity constraints, triggers and assertions. 5. Understand various storage structures and query

		optimization.
2)	**THEORY OF COMPUTATIONS (BTCOC502)**	1. Acquire fundamental understanding of the core concepts in automata theory and formal languages. 2. Design grammars and automata (recognizers) for different language classes. 3. Model, compare & analyze different computational models and identify their capabilities and limitations 4. Apply rigorously formal mathematical methods to prove properties of languages, grammars and automata. 5. Model various kinds of real-time problems such as designing the compilers
3)	**SOFTARE ENGINEERING BTCOC503**	1. Comprehend software development life cycle 2. Prepare SRS document for a project 3. Apply software design and development techniques 4. Identify verification and validation methods in a software engineering project 5. Implement testing methods at each phase of SDLC 6. Analyze and Apply project management techniques for a case study
4)	**HUMAN COMPUTER INTERACTION BTCOE504 (A)**	1. To understand some basic concepts of research and its methodologies 2. To identify appropriate research topics 3. To select and define appropriate research problem and parameters 4. To write a research report and thesis
5)	**NUMAERICAL METHOD BTCOE504(B)**	1. Apply numerical methods to obtain approximate solutions to mathematical problems 2. Derive numerical methods for various mathematical operations and tasks, such as interpolation, differentiation, integration, the solution of linear and nonlinear equations, and the solution of differential equations 3. Analyze and evaluate the accuracy of common numerical methods 4. Apply various interpolation methods and finite difference concepts 5. Interpret calculation and errors in numerical method.
6)	**BUSINESS COMMUNICATION (BTHM(B)505)**	1. Communicate effectively by avoiding barriers in various formal and informal situations. 2. Communicate skillfully using non-verbal methods of communication 3. Give presentations by using audio- visual aids 4. Write reports using correct guidelines

		5. Compose e-mail and formal business letters

SEMETER-VI **(T.Y.-II)**

Sr. No.	Subject Name	
1)	**COMPILER DESIGN (BTCOC601)**	1. To enrich the knowledge in various phases of compiler and its use 2. To introduce the concepts underlying the design and implementation of language processors. 3. To apply regular grammar and cfg techniques for analysis phases 4. To construct parsers using parsing techniques 5. To study intermediate representations 6. To provide practical programming skills necessary for constructing a compiler.
2)	**COMPUTER NETWORKS (BTCOC602)**	1. To develop an understanding of modern network architectures from a design and performance perspective. 2. Analyze the requirements for a given organizational structure and select the most appropriate networking architecture and basic LAN technologies. 3. To study the error corrections and detection methods and networking components. 4. Ability to write program using socket programming. 5. Apply the knowledge of application layer protocols such as DNS, SMTP, POP, FTP, and HTTP. To design the socket 6. Identify various network security principles such as authentication, firewalls
3)	**MACHINE LEARNING (BTCOC603)**	1. To introduce students to the basic concepts and techniques of machine learning. 2. Characterize machine learning algorithms as supervised, semi-supervised, and unsupervised. 3. To develop skills of using recent machine learning algorithm for solving practical problems. 4. Understand the concept behind neural networks for learning non-linear functions.

4)	**INTERNET OF THINGS (BTCOE604B)**	1. Apply the concepts of IOT. 2. Identify the different technology. 3. Apply IOT to different applications. 4. Analysis and evaluate protocols used in IOT. 5. Design and develop applications in IOT. 6. Analyze and evaluate the data received through sensors in IoT.
5)	**EMPLOYABILITY AND SKILL DEVELOPMENT (BTHM605B)**	1. Have skills and preparedness for aptitude tests. 2. Be equipped with essential communication skills (writing, verbal and non-verbal) 3. Master the presentation skill and be ready for facing interviews. 4. Build team and lead it for problem solving
6)	**CONSUMER BEHAVIOUR (BTCOE605C)**	1. To understand consumer behaviour in an informed and systematic way. 2. To analyse personal, socio-cultural, and environmental dimensions that influence consumer decisions making. 3. To enable students in designing and evaluating the marketing strategies based on fundamentals of consumer buying behaviour. 4. To give the students a perspective to understand the application of market research in framing effective marketing strategies

SEMETER-VII **(B.TECH-I)**

Sr. No.	Subject Name	Course Outcomes
1)	**SOFTWARE ENGINEERING (BTCOC701)**	1. Apply software engineering principles to develop software. 2. Analyze software requirements and formulate design solution for a software 3. Explain concepts of project estimation, planning and scheduling. 4. Explain risk management and software configuration management. 5. Explain various types of software testing.

2)	**DISTRIBUTED SYSTEM (BTCOE702A)**	1. To learn the principles, architectures, algorithms and programming models used in distributed systems. 2. Ability to write distributed programs using sockets, RPC/RMI, etc. 3. Appreciation of the differences in the handling of issues like mutual exclusion, deadlock detection, fault handling, etc. In a centralized system and a distributed system 4. To gain experience in the application of fundamental computer science methods and algorithms in the development of distributed systems and distributed systems applications
3)	**CLOUD COMPUTING (BTCOE703A)**	1. Implement the concept of virtualization and how this has enabled the development of cloud computing. 2. Know the fundamentals of cloud; cloud architectures and types of services in cloud. 3. Understand scaling, cloud security and disaster management. 4. Design different applications in cloud. 5. Explore some important cloud computing driven commercial systems.
4)	**BLOCKCHAIN TECHNOLOGY (BTCOE704A)**	1. Discuss and overview the concepts of crypto-currency, bit coin and blockchain technology 2. Study and apply basic crypto primitives such as hash function, public key cryptography and digital signatures 3. Se permissioned model and its use cases in blockchain technology and discuss the design issues for permissioned blockchain and contracts execution. 4. Design and implement enterprise applications of blockchain such as cross border payment, kyc, food security etc 5. Develop blockchain application development hyperledger fabric- architecture.

SEMETER-VIII **(B.TECH-II)**

Sr. No.	**Subject Name**	Course Outcomes

1)	**DEEP LEARNING (BTCOE801A)**	1. Explain the basic concepts in neural networks and applications 2. Discuss feed forward networks and their training issues 3. Distinguish different types of ANN architectures 4. Explain the deep learning concepts using back propagation network
2)	**INTRODUCTION TO INDUSTRY 4.0 AND INDUSTRIAL INTERNET OF THINGS**	1. To understand the technological aspects of industry 4.0 and IIOT 2. To study predictive and prescriptive analytics applied in IIOT-based implementations 3. To understand applications and case studies of IIOT

Name of the Department- Electronics & Telecommunication Engineering

Course Outcomes (COs)

SEMETER-V **(T.Y.-I)**

Sr. No.	Subject Name	Course Outcomes
1)	**Electromagnetic Field Theory (BTETC501)**	1. Understand characteristics and wave propagation on high frequency transmission lines 2. Carryout impedance transformation on TL 3. Use sections of transmission line sections for realizing circuit elements 4. Characterize uniform plane wave 5. Calculate reflection and transmission of waves at media interface 6. Analyze wave propagation on metallic waveguides in modal form 7. Understand principle of radiation and radiation characteristics of an antenna
2)	**Analog Communication(BTETC503)**	1. Understand and identify the fundamental concepts and various components of analog communication systems 2. Understand the concepts of modulation and demodulation techniques. 3. Design circuits to generate modulated and demodulated wave. 4. Equip students with various issues related to analog communication such as modulation, demodulation, transmitters and receivers and noise performance. 5. Understand the concepts of modulation and demodulation techniques of angle modulation (frequency and phase). 6. Explain signal to noise ratio, noise figure and noise temperature for single and cascaded stages in a communication system. 7. Develop the ability to compare and contrast the strengths and weaknesses of various communication systems

3)	**Embedded System Design (BTETPE504B)**	1. The student will study ARM Processor based Embedded System design 2. The student will be able to do programming in Embedded programming in C,C++ 3. The student will understand Linux operating system and device driver 4. The student will demonstrate the knowledge of Real Time Operating System .
4)	**Digital Signal Processing (BTETC502)**	1. Understand use of different transforms and analyze the discrete time signals and systems. 2. Realize the use of LTI filters for filtering different real world signals. 3. Capable of calibrating and resolving different frequencies existing in any signal. 4. Design and implement multistage sampling rate converter. 5. Design of different types of digital filters for various applications.
5)	**Artificial Intelligence and Machine Learning(BTETOE505B)**	1. Identify the AI based problems. 2.Apply techniques to solve the AI problems 3.Define learning and explain various logic inferences 4.Discuss different learning techniques

SEMETER-VI **(T.Y.-II)**

Sr. No.	Subject Name	Course Outcomes
1)	**Antennas and Wave Propagation (BTETC601)**	1. Formulate the wave equation and solve it for uniform plane wave. 2. Analyze the given wire antenna and its radiation characteristics. 3. Identify the suitable antenna for a given communication system.

2)	**Microprocessors and Microcontrollers(BTETPE603A)**	1. Students get ability to conduct experiments based on interfacing of devices to or interfacing to real world applications. 2. Students get ability to interface mechanical system to function in multidisciplinary system like in robotics, Automobiles. 3.Students can identify and formulate control and monitoring systems using microprocessors 4 Learn use of hardware and software tools. 5.Develop interfacing to real world devices. 6. Graduates will be able to design real time controllers using microcontroller-based system. 7. Learn importance of microcontroller in designing embedded application.
3)	**Patents and IPR(BTETOE604F)**	1. Understanding that when IPR would take such important place in growth of individuals & nation, it is needless to emphasis the need of information about Intellectual Property Right to be promoted among students in general & engineering in particular. 2. Understand that IPR protection provides an incentive to inventors for further research work and investment in R & D, which leads to creation of new and better products, and in turn brings about, economic growth and social benefits.
4)	**Employability & Skill Development (BTHM605)**	1. Have skills and preparedness for aptitude tests. 2.Be equipped with essential communication skills (writing, verbal and non-verbal) 3. Master the presentation skill and be ready for facing interviews. 4. Build team and lead it for problem solving.
5)	**Digital Communication (BTETC701)**	1. Analyze the performance of a baseband and pass band digital communication system in terms of error rate and spectral efficiency 2. Perform the time and frequency domain analysis of the signals in a digital communication System 3. Select the blocks in a design of digital communication system. 4. Analyze Performance of spread spectrum communication system.

Name of the Department- Electrical Engineering

Course Outcomes (COs)

SEMETER-III **(S.Y.-I)**

Sr. No.	Subject Name	Course Outcomes
1)	**Engineering Mathematics-III (BTBS301)**	1. Solve higher order linear differential equation using appropriate techniques for modeling and analyzing electrical circuits. 2. Solve problems related to Fourier transform, Laplace transform and applications to Communication systems and Signal processing. 3. Obtain Interpolating polynomials, numerically differentiate and integrate functions, numerical solutions of differential equations using single step and multi-step iterative methods used in modern scientific computing. 4. Perform vector differentiation and integration, analyze the vector fields and apply to Electromagnetic fields. 5. Analyze conformal mappings, transformations and perform contour integration of complex functions in the study of electrostatics and signal processing.
2)	**Electrical Machines – I (BTEEC302)**	1. To build a firm foundation of Electrical Transformers and DC Machines. 2. To clearly understand the basic concepts of the electrical machines working and various types of generators and motors is also carried out. 3. To study diff. types, construction and operating principle of diff. types of electrical machines

3)	**Electrical and Electronic measurement (BTEEC303)**	1. To understand philosophy of measurement 2. To understand different methods analog and digital measurement. 3. To study principle of construction and operation of different transducer and dismay methods.
4)	**Basic Human Rights (BTHM304)**	1. Understand the history of human rights. 2. Learn to respect others caste, religion, region and culture. 3. Be aware of their rights as Indian citizen. 4. Understand the importance of groups and communities in the society. 5. 6. Realize the philosophical and cultural basis and historical perspectives of human rights. 7. Make them aware of their responsibilities towards the nation
5)	**Engineering material science (BTES305)**	1. To study about crystal structure 2. To understand magnetic material structure 3. To study about conducting and superconducting materials 4. To study dielectric and nano materials

SEMETER-IV **(S.Y.-II)**

Sr. No.	Subject Name	Course Outcomes
1)	**Network theory (BTEEC401)**	1. To review basic components of electric network 2. To design and develop network equations and their solutions.

		3. To apply Laplace theorem for electric network analyses 4. To analyze AC circuit.
2)	**Power System (BTEEC402)**	1. To Understand basic operation of power system, power system components and their characteristics. 2. To introduce the students to the general structure of the network for transferring power from generating stations to the consumers.
3)	**Electrical Machine-II (BTEEC403)**	1. To study the principle of operation and the effect of pulsating, rotating magnetic fields on the working of AC machines 2. To understand armature winding layouts and concept of armature reaction with phasor diagrams. 3. To study the different staring, speed control methods and equivalent circuit diagram of poly phase and single phase machines. 4. To study the different staring, speed control methods and equivalent circuit diagram of poly phase and single phase machines. 5. To know the different types of special machines apart from the conventional ac motors.
4)	**Analog and digital electronics (BTBS404)**	1. To review basic number system 2. To understand design and characteristics of digital logic gates. 3. To study different techniques in use of digital circuits. 4. To design digital systems.
5)	**Advance renewable energy sources (BTEEPE405)**	1. To review energy scenario. 2. To understand basic concepts , construction and operational features of different non-conventional sources.

SEMETER-V **(T.Y.-I)**

Sr. No.	Subject Name	Course Outcomes
1)	**Power system analysis (BTEEC 501)**	1. To study different parameters of power system operation and control 2 To study load flow and Diff. methods of reactive power control. 3. To understand diff. methods of fault analysis and stability study
2)	**Microprocessor and microcontroller (BTEEC 502)**	1. To understand interfacing and interrupt features of 8085 and 8051. 2. To know architecture of 8085 and 8051. 3. To develop program for basic applications.
3)	**Power electronics (BTEEC503)**	1. To review principle of construction, operation and characteristics of basic semiconductor devices. 2. To understand and analyze performance of controlled and uncontrolled converters. 3. To understand and analyze performance of DC to DC converters. Dc to AC converters 4 To understand and analyze performance of AC voltage controllers.
4)	**Power quality issues (BTEEPLE 504)**	1. To learn different types of power quality phenomena. 2. To identify sources for voltage sag, voltage swell, interruptions, transients, long duration over voltages and harmonics in a power system. 3. To describe power quality terms and study power quality standards 4. To study various methods of power quality

		monitoring.
5)	**Electrical Safety (BTEEOE505)**	1. Identify the hazards associated with electricity: shock and fire 2. Describe basic safety controls and practices at work 3. Identify and explain how to respond to electrical emergencies

SEMETER-VI **(T.Y.-II)**

1)	**Switchgear and protection (BTEEC 601)**	1. Student will be able to get the in-depth understanding of how the major equipment's used in the power system are being protected against faults and abnormal conditions 2. To learn Protection concept of Alternator, Transformer, Motor, Busbar & Transmission line. 3 To identify various types of Circuit interrupting devices.
2)	**Electrical Machine Design (BTEEC602)**	1. To understand principles of electric machine design. 2. To design different components of electric machine. 3. To design Transformer 4. To understand CAD and use it for transformer design
3)	**Control system engineering (BTEEC603)**	1. To understand the behavior of nonlinear control system. 2. To design and analyze PID controller. 3. To understand and analyze state variable technique.

		4. To design and analyze suitable control system for engineering application.
4)	**Modeling, simulation and control of electrical drives (BTEEPE604C)**	1. Students will Gain an ability to design and conduct performance experiments, as well as to identify, formulate and solve drives related problems. 2. To understand the basic concept of working and control of modern electrical drives.
5)	**Power plant Engineering (BTEEOE605)**	1. To study the power generation scenario, the components of thermal power plant, improved Rankin cycle, Cogeneration cycle. 2. To understand details of steam condensing plant, analysis of condenser, the environmental impacts of thermal power plant, method to reduce various pollution from thermal power plant. 3. To study layout, component details of hydroelectric power plant, hydrology and elements, types of nuclear power plant 4. To understand components; layout of diesel power plant , components; different cycles ; methods to improve thermal efficiency of gas power plant

SEMETER-VII **(B.TECH-I)**

Sr. No.	Subject Name	Course Outcomes
1)	**Power System Operation & Control (BTEEC701)**	1. To understand the fundamental concepts of power system. 2. To obtain mathematical model of Synchronous machine, excitation and speed governing system. 3. To analyze the transient stability of power system. 4. To understand the economic operation of

		power system. 5. To explain various techniques of reactive power and voltage Control
2)	**High Voltage Engineering (BTEEC702)**	1. To study conduction and breakdown in gases, liquids and solids. 2. To understand the methods and measurement of high voltage generation and measurement 3. To explain the lightening phenomenon and insulation co-ordination. 4. To know different non-destructive testing and standards in HV.
1)	**Electrical drives (BTEEC703)**	1. Students will be able to understand the dynamics of drive system. 2. Students will be able to use various methods of speed control of AC and DC Drive. 3. Students will be have the ability to analyze the drive system 4. Students will be able to select proficiently and the proper drive system for particular application. CO5 Students will be able to have basic knowledge of recent advancement in Electric Drive.
2)	**HVDC transmission and facts (BTEEE705D)**	1. To understand importance, configuration and types of HVDC transmission. 2. To analyst the operation of HVDC converter, system control and protection. 3. To understand the concept of FACTS, their role, type and functionality. 4. To analyze the operation of static series and shunt compensator.
3)	**Electric traction & utilization (BTEEE704B)**	1. To possess knowledge of advanced and emerging topics in traction mechanism and illumination engineering and their applications in the field.

		2. An ability to design a traction system, a component, to meet desired needs of locomotive industry within realistic constraints and confirms manufacturability, and sustainability. 3. To mold students professionally to possess in-depth and advanced knowledge by course contents along with emerging topics.

SEMETER-VII **(B.TECH-I)**

Sr. No.	Subject Name	Course Outcomes
1)	**DC power transmission system**	1. This course gives an introduction to the DC power transmission system using the conventional line commutated converters. 2. The topic covered include detail analysis of the 6 pulse line commutated converter, DC link control and design of single tuned filter.
2)	**Entrepreneurship essentials**	1. Acquire fundamental knowledge of the various systems of an automobile, 2. Associate the functions of each system with its design and layout, depict the various systems using simple schematics, and apply concepts learnt in core undergraduate courses to synthesize mathematical models of the various systems.

Name of the Department- Mechanical Engineering

Course Outcomes (COs)

SEMETER-III **(S.Y.-I)**

Sr. No.	Subject Name	Course Outcomes
1.	**Engineering Mathematics-III (BTBS301)**	1. Solve higher order linear differential equation using appropriate techniques for modeling and analyzing electrical circuits. 2. Solve problems related to Fourier transform, Laplace transform and applications to Communication systems and Signal processing. 3. Obtain Interpolating polynomials, numerically differentiate and integrate functions, numerical solutions of differential equations using single step and multi-step iterative methods used in modern scientific computing. 4. Perform vector differentiation and integration, analyze the vector fields and apply to Electromagnetic fields. 5. Analyze conformal mappings, transformations and perform contour integration of complex functions in the study of electrostatics and signal processing.
2	**Fluid Mechanics (BTMC302)**	1. Define fluid, define and calculate various properties of fluid 2. Calculate hydrostatic forces on the plane and curved surfaces and explain stability of 3. floating bodies 4. Explain various types of flow. Calculate acceleration of fluid particles 5. Apply Bernoulli's equation to simple problems in fluid mechanics 6. Explain laminar and turbulent flows on flat plates and through pipes 7. Explain and use dimensional analysis to simple problems in fluid mechanics

		8. Understand centrifugal pump.
3	**Thermodynamics (BTMC303)**	1. Define the terms like system, boundary, properties, equilibrium, work, heat, ideal gas, entropy etc. used in thermodynamics. 2. Studied different laws of thermodynamics and apply these to simple thermal systems to study energy balance. 3. Studied Entropy, application and disorder. 4. Studied various types of processes like isothermal, adiabatic, etc. considering system with ideal gas and represent them on p-v and T-s planes. 5. Represent phase diagram of pure substance (steam) on different thermodynamic planes like p-v, T-s, h-s, etc. Show various constant property lines on them.
4.	**Material Science and Metallurgy(BTMES304)**	1. Study various crystal structures of materials 2. Understand mechanical properties of materials and calculations of same using appropriate equations 3. Evaluate phase diagrams of various materials 4. Suggest appropriate heat treatment process for a given application 5. Prepare samples of different materials for metallography 6. Recommend appropriate NDT technique for a given application
5.	**Machine Drawing and CAD Lab (BTMCL305)**	1. Interpret the object with the help of given sectional and orthographic views. 2. Construct the curve of intersection of two solids 3. Draw machine element using keys, cotter, knuckle, bolted and welded joint 4. Assemble details of any given part. i. e. valve, pump , machine tool part etc. 5. Represent tolerances and level of surface finish on

		production drawings 6. Understand various creating and editing commands in Auto Cad

SEMETER-IV **(S.Y.-II)**

Sr. No.	Subject Name	Course Outcomes
1.	**Manufacturing Processes-I (BTMC401)**	1. Identify castings processes, working principles and applications and list various defects in metal casting 2. Understand the various metal forming processes, working principles and applications 3. Classify the basic joining processes and demonstrate principles of welding, brazing and soldering. 4. Study center lathe and its operations including plain, taper turning, work holding devices and cutting tool. 5. Understand milling machines and operations, cutters and indexing for gear cutting. 6. Study shaping, planning and drilling, their types and related tooling's
2.	**Theory of Machines- I (BTMC402)**	1. Define basic terminology of kinematics of mechanisms 2. Classify planar mechanisms and calculate its degree of freedom 3. Perform kinematic analysis of a given mechanism using ICR and RV methods 4. Introduction of different types of lubrication system. 5. Perform kinematic analysis of slider crank mechanism using Klein's construction and analytical approach 6. Perform balancing of unbalance forces in rotating masses, different types of single/multi cylinder reciprocating

		engines in different positions.
3.	**Basic Human Rights (BTHM403)**	1. Understand the history of human rights. 2. Learn to respect others caste, religion, region and culture. 3. Be aware of their rights as Indian citizen. 4. Understand the importance of groups and communities in the society. 5. Realize the philosophical and cultural basis and historical perspectives of human rights. 6. Make them aware of their responsibilities towards the nation
4.	**Strength of Materials (BTMES404)**	1. State the basic definitions of fundamental terms such as axial load, eccentric load, stress, strain, E, μ, principle stresses, etc. 2. Analyze the stresses and strain energy in different load cases 3. Design the columns based on deflection 4. Design a beam based on bending and shafts based on torsion 5. Analyze given beam for calculations of SF and BM 6. Calculate slope and deflection at a point on cantilever /simply supported beam using double integration, Macaulay's , Area-moment and superposition methods
5	**Sheet Metal Engineering (BTMPE405B)**	1. Recognize common manufacturing processes of Sheet Metal Fabrication 2. Understand the principles of design and fabricate of sheet metal products and recognize common material used in the industry 3. Distinguish Shearing, Drawing and Pressing etc. processes. 4. Know types of dies and formability.

		5. Select mechanical or hydraulic presses for the given process

SEMETER-V **(T.Y.-I)**

Sr. No.	Subject Name	Course Outcomes
1)	**Heat Transfer (BTMC 501)**	1. 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 2. Describe the critical radius of insulation, overall heat transfer coefficient, thermal conductivity and lumped heat transfer 3. Interpret the extended surfaces 4. Illustrate the boundary layer concept, dimensional analysis, forced and free convection under different conditions 5. Describe the Boiling heat transfer, Evaluate the heat exchanger and examine the LMTD and NTU methods applied to engineering problems 6. Explain the thermal radiation black body, emissivity and reflectivity and evaluation of view factor and radiation shields
2)	**Machine Design – I (BTMC 502)**	1. Formulate the problem by identifying customer need and convert into design Specification 2. Understand component behavior subjected to loads and identify failure criteria 3. Analyze the stresses and strain induced in the component 4. Design of machine component using theories of failures 5. Design of component for finite life and infinite life when subjected to fluctuating load

		6. Design of components like shaft, key, coupling, screw and spring
3)	**(Theory of Machines – II) BTMC 503**	1. Identify and select type of belt and rope drive for a particular application 2. Evaluate gear tooth geometry and select appropriate gears, gear trains 3. Define governor and select/suggest an appropriate governor 4. Characterize flywheels as per engine requirement 5. Understand gyroscopic effects in ships, aero planes, and road vehicles. 6. Understand free and forced vibrations of single degree freedom systems
4)	**Automobile Engineering (BTAPE504D)**	1.Identify the different parts of the automobile 2.Explain the working of various parts like engine, transmission, clutch, brakes etc., 3.Demonstrate various types of drive systems; front and rear wheels, two and four wheel drive 4.Apply vehicle troubleshooting and maintenance procedures. 5.Analyze the environmental implications of automobile emissions. And suggest suitable regulatory modifications.
5)	**Renewable Energy Sources (BTMOE505B)**	1. Explain the difference between renewable and non-renewable energy 2. Describe working of solar collectors 3. Explain various applications of solar energy 4. Describe working of other renewable energies such as wind, biomass , nuclear
		1. Define the terms like calorific value of fuel, stoichiometric air-fuel ratio, excess air, equivalent evaporation, boiler efficiency, etc. Calculate

6)	**Applied Thermodynamics (BTMC506)**	minimum air required for combustion of fuel. 2. Studied and Analyze gas power cycles and vapour power cycles and derive expressions for the performance parameters like thermal efficiency. 3. Classify various types of boilers, nozzle, steam turbine and condenser used in steam power plant. 4. Classify various types' condenser, nozzle and derived equations for its efficiency. 5. Draw P-v diagram for single-stage reciprocating air compressor, with and without clearance volume, and evaluate its performance. Differentiate between reciprocating and rotary air compressors.
7)	**Mechanical Engineering Lab – III (BTMCL 507)**	1. Understand the various heat transfer mode of heat transfer and its application and verify 2. Learn the experimental methodology 3. Explain various types of gear boxes, gear trains, belt and rope drives 4. Interpreting physical principles and phenomenon of governor, gyroscopic, flywheel 5. Apply design process to an open ended problem 6. Determine suitable material and size for structural component of machine/system
8)	**IT – 2 Evaluation(BTMI408)**	1. To make the students aware of industrial culture and organizational setup 2. To create awareness about technical report writing among the student.

SEMETER-VI **(T.Y.-II)**

1)	**Manufacturing Processes - II (BTMC 601)**	1. Understand the process of powder metallurgy and its applications 2. Calculate the cutting forces in orthogonal and oblique cutting 3. Evaluate the machinability of materials 4. Understand the abrasive processes 5. Explain the different precision machining processes 6. Understanding plastic
2)	**Machine Design – II (BTMC602)**	1. Define function of bearing and classify bearings. 2. Understanding failure of bearing and their influence on its selection. 3. Classify the friction clutches and brakes and decide the torque capacity and friction disk parameter. 4. Select materials and configuration for machine element like gears. 5. Design of elements like gears, belts for given power rating
3)	**IC Engines (BTMPE603A)**	1. Understand various types of I.C. Engines and Cycles of operation. 2. Analyze the effect of various operating variables on engine performance 3. Identify fuel metering and fuel supply systems for different types of engines 4. Understand normal and abnormal combustion phenomena in SI and CI engines 5. Evaluate performance Analysis of IC Engine and Justify the suitability of IC Engine for

		different application 6. Understand the conventional and non-conventional fuels for IC engines and effects of emission formation of IC engines, its effects and the legislation standards
4)	**Robotics (BTMPE604D)**	1. List the various components of a typical Robot, grippers, sensors, drive system and describe their functions 2. Calculate the word to joint and joint to word coordinates using forward and reverse transformations 3. Calculate the gripper forces, drive sizes, etc. 4. Develop simple robot program for tasks such as pick and place, arc welding, etc. using some robotic language such as VAL-II, AL, AML, RAIL, RPL, VAL 5. Evaluate the application of robots in applications such as Material Handling, process operations and Assembly and inspection 6. Discuss the implementation issues and social aspects of robotics
5)	**Energy Conservation and Management (BTMOE605C)**	1. Understand energy problem and need of energy management 2. Carry out energy audit of simple units 3. Study various financial appraisal methods 4. Analyze cogeneration and waste heat recovery systems 5. Do simple calculations regarding thermal insulation and electrical energy conservation

6)	**Mechanical Engineering Lab – IV**	1. Apply design process to an open ended problems 2. Determine suitable material and size for structural component of machine/system 3. Conduct test on IC Engines to study their performance. 4. Draw performance curves of these machines/systems
7)	**B. Tech Seminar (BTMS607)**	1.To expose and make students aware with latest research and research publications 2. To understand the research and research publication, references, citation 3. To enhance the presentation skill 4. To enhance the report writing 5. To make the student aware about research publication sites
8)	**Mini Project (BTAP608)**	1.Visit nearby places to understand the problems of the community 2. Select one of the problems for the study, state the exact title of the project and define scope of the problem 3. Explain the motivation, objectives and scope of the project

SEMETER-VII **(B.TECH-I)**

Sr. No.	Subject Name	Course Outcomes
		1. Define sensor, transducer and understand the applications of different sensors and transducers 2. Explain the signal conditioning and data representation techniques 3. Design pneumatic and hydraulic circuits for a given application 4. Write a PLC program using Ladder logic for a

1)	**Mechatronics (BTMEC701)**	given application 5. Understand applications of microprocessor and micro controller 6. Analyse PI, PD and PID controllers for a given application
2)	**CAD/CAM (BTMEC702)**	1. List and describe the various input and output devices for a CAD work station 2. Carry out/calculate the 2-D and 3-D transformation positions (Solve problems on 2-Dand 3-D transformations) 3. Describe various CAD modeling techniques with their relative advantages and limitations 4. Describe various CAD modeling techniques with their relative advantages and limitations 5. Develop NC part program for the given component, and robotic tasks 6. Describe the basic Finite Element procedure 7. Explain various components of a typical FMS system, Robotics, and CIM 8. Classify parts in part families for GT 9. Describe and differentiate the CAPP systems
3)	**Manufacturing Processes – III (BTMEC703)**	1. Differentiate clearly between NC and CNC machines 2. Prepare and execute a part program for producing a given product 3. Select appropriate non-traditional machining process for a given application 4. Compare different surface coating techniques 5. Explain different rapid prototyping techniques 6. Illustrate the working principle of various micro-manufacturing processes
		1. Impart fundamental knowledge and skill sets required in the Industrial Management and

4)	**Industrial Engineering and Management (BTMEC704B)**	Engineering profession, which include the ability to apply basic knowledge of mathematics, probability and statistics, and the domain knowledge of Industrial Management and Engineering 2. Produce ability to adopt a system approach to design, develop, implement and innovate integrated systems that include people, materials, information, equipment and energy. 3. Understand the interactions between engineering, businesses, technological and environmental spheres in the modern society. 4. Understand their role as engineers and their impact to society at the national and global context.
5)	**Intellectual Property Rights (BTMC705B)**	1. State the basic fundamental terms such as copyrights, Patents, Trademarks etc., 2. Interpret Laws of copy-rights, Patents, Trademarks and various IP registration Processes. 3. Exhibit the enhance capability to do economic analysis of IP rights, technology and innovation related policy issues and firms commercial strategies. 4. Create awareness at all levels (research and innovation) to develop patentable technologies. 5. Apply trade mark law, copy right law, patent law and also carry out intellectual property audits. 6. Manage and safeguard the intellectual property and protect it against unauthorized use
		1. Understand the various types of sensors and their applications 2. Design a pneumatic circuit for a given application 3. Design a hydraulic circuit for a given

6)	**Mechatronics Lab (BTMEL707)**	application 4. Write a PLC program using Ladder logic 5. Experiment PID controller for controlling temperature 6. Demonstrate the capacitance sensor for measuring level
7)	**CAD/CAM Lab (BTMEL708)**	1. Construct CAD part models, assembly model and drafting of machine elements using CAD software. 2. Evaluate stresses in components subjected to simple structural loading using FE software 3. Write NC programs for turning and milling 4. Describe case study of industrial robots
8)	**Seminar (BTMES709)**	1. State the exact title of the seminar 2. Explain the motivation for selecting the seminar topic and its scope 3. Search pertinent literature and information on the topic 4. Critically review the literature and information collected 5. Demonstrate effective written and verbal communication
9)	**Field Training/Internship/Industrial Training – III (BTMEF710)**	1. To make the students aware of industrial culture and organizational setup 2. To create awareness about technical report writing among the student.
		1. State the exact title of the project and problem definition 2. Explain the motivation, objectives and scope of the project 3. Review the literature related to the selected topic of the project

10)	**Project Stage – (IBTMEP711)**	4. Design the mechanism, components of the system and prepare detailed drawings. 5. Evaluate the cost considering different materials/manufacturing processes

SEMETER-VII **(B.TECH-II)**

Sr. No.	**Subject Name**	Course Outcomes
1)	**Project Stage – II/Internship and Project (BTMEP803)**	1. State the aim and objectives for this stage of the project 2. Construct and conduct the tests on the system/product 3. Analyze the results of the tests. 4. Discuss the findings, draw conclusions, and modify the system/product, if necessary
2)	**Fundamentals of Automotive Systems (BTMEC801A)**	1. Acquire fundamental knowledge of the various systems of an automobile, 2. Associate the functions of each system with its design and layout, depict the various systems using simple schematics, and apply concepts learnt in core undergraduate courses to synthesize mathematical models of the various systems.
3)	**Non-Conventional Energy Resources (BTMEC801F)**	1. Understand Of Renewable and Non-Renewable Sources of Energy 2. Gain Knowledge About Working Principle Of Various Solar Energy Systems 3. Understand The Application Of Wind Energy And Wind Energy Conversion System 4. Understand The Applications Of Different Renewable Energy Sources Like Biomass, Geothermal Energy Etc. 5. Understand The Various Energy Storage Systems

Name of the Department- Basic Sciences & Humanities (UG)

Course Outcomes (COs)

SEMETER-I **(F.Y.-I)**

Sr. No.	Subject Name	Course Outcomes
1	**Engineering Mathematics-I (BTBS101)**	1. Apply the matrix technique (Linear algebra) to find solutions of system of linear equations arising in many engineering problem 2. Demonstrate the concept partial derivatives and their applications to Maxima/ Minima,series expansion of multi valued functions. 3. Compute Jacobian of functions of several variables and their applications to engineering problems 4. Identify and sketch of curves in various coordinate system. 5. Evaluate multiple integrals and their applications to area and volume.
2	**Engineering Physics (BTBS102/202)**	1. Explain & apply the concept of types of Oscillation, Dielectric properties & ultrsonics 2. Explain & compare between Interference & Polarisation of light ,working Principle of Lasers & Fiber optics 3. Interprete,apply &demonstrate principle of motion of charged particles in EF&MF,BAinbridge Mass spectrograph &G M counter 4. Identify Types of crystals & crystal planes using Miller indices,Experemental apprroach.
3	**Engineering Graphics (BTES103/203)**	1. Use of drawing instruments effectively for drawing and dimensioning. 2. Explain conventions and methods of engineering drawing. 3. Apply concept of projections of points, lines, planes, solids and section of solids.

		4. Construct isometric and orthographic views of given objects.
4.	**Communication Skills (BTHM104/204)**	1. Apply speaking and writing skills in professional as well as social situations 2. Overcome Mother Tongue Influence and demonstrate neutral accent while exercising English 3. Apply communication skills for Presentations, Group Discussion and interpersonal interactions. 4. Apply grammar correctly during Speaking and Writing situations especially in context with Presentations, Public Speaking, Report writing and Business Correspondence
5.	**Energy and Environment Engineering (BTES105/205)**	1. Identify conventional ,non conventional energy sources. 2. Know and discuss power consuming and power developing devices for effective utilization and power consumption 3. Identify various sources of air, water pollution and its effects. 4. Know and discuss noise,soil, thermal pollution and Identify solid, biomedical and hazardous waste.
6.	**Basic Civil and Mechanical Engineering (BTES106/206)**	1. Identify various Civil Engineering materials and choose suitable material among various options 2. Apply principles of surveying to solve engineering problem 3. Identify various Civil Engineering structural components and select appropriate structural system among various options 4. Explain and define various properties of basic thermodynamics, materials and manufacturing processes. 5. Know and discuss the working principle of various

		power consuming and power developing devices

SEMETER-I **(F.Y.-II)**

7.	**Engineering Mathematics – II (BTBS201)**	1. Discuss the need and use of complex variables to find roots ,to separate complex quantities and to establish relation between circular and hyperbolic functions. 2. Solve first and higher order differential equations and apply them as a mathematical modeling in electric and mechanical systems. 3. Determine Fourier series representation of periodic functions over different intervals. 4. Demonstrate the concept of vector differentiation and interpret the physical and geometrical meaning of gradient, divergence &curl in various engineering streams. 5. Apply the principles of vector integration to transform line integral to surface integral ,surface to volume integral &vice versa using Green‟s , Stoke‟s and Gauss divergence theorems.
8.	**Engineering Chemistry (BTBS102/202)**	1. Demonstrate knowledge of chemistry in technical fields 2. Bring adaptability to new developments in Engineering Chemistry and to acquire the skills required to become a perfect engineer. 3. Develop the importance of water in industrial and domestic usage. 4. Identify the concepts of Chemistry to lay the ground work for subsequent studies in various engineering fields.

		5. Examine a fuel and suggest alternative fuels.
9.	**Engineering Mechanics (BTES103/203)**	1. Apply fundamental Laws of Engineering Mechanics 2. Apply Conditions of static equilibrium to analyze given force system 3. Compute Centre of gravity and Moment of Inertia of plane surfaces 4. Compute the motion characteristics of a body/particle for a Rectilinear and Curvilinear Motion 5. Know and discuss relation between force and motion characteristics
10.	**Computer Programming in C (BTES104/204)**	1. Gain a broad perspective about the uses of computers in engineering industry and C Programming. 2. Develop the basic concept of algorithm, algorithmic thinking and flowchart. 3. Apply the use of C programming language to implement various algorithms and develops the basic concepts and terminology of programming in general 4. Use the more advanced features of the C language 5. Identify tasks in which the numerical techniques learned are applicable and apply them to write programs and hence use computers effectively to solve the task.
11.	**Basic Electrical and Electronics Engineering (BTES106/206)**	1. Apply basic ideas and principles of electrical engineering. 2. Identify protection equipment and energy storage devices. 3. Differentiate electrical and electronics domains and explain the operation of diodes and

		transistors. 4. Acquire knowledge of digital electronics 5. Design simple combinational and sequential logic circuits.

PRGRAMM OUTCOMES (PO's) AND PROGRAM EDUCATIONAL OBJECTIVES (PEO's) (PG)

Name of the Department- Electrical Engineering

Program Outcomes (PO's)

PO1	Ability to apply knowledge of science, mathematics, and engineering principles for solving problems.
PO2	Ability to identify, formulate and solve electrical power system problems
PO3	Ability to understand and use different software tools in the domain of Power electronics, power system and control system simulations.
PO4	Ability to design and conduct experiments and analyze and interpret data.
PO5	Ability to coherently work in a multidisciplinary team.
PO6	Demonstrate sensitivity towards professional and ethical responsibility.
PO7	Ability to communicate effectively in writing as well as through public speaking.
PO8	Demonstrate ability to appreciate and engage in lifelong learning.
PO9	Demonstrated knowledge of contemporary issues
PO10	An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
PO11	The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.

Program Educational Objectives (PEOs)

PEO1	To prepare graduates meet the challenges of modern society through viable engineering solutions.
PEO2	To prepare graduates to develop economically viable cutting edge technology for local industry. Need.
PEO3	To prepare graduates to inspire next generation graduates as successful engineer/ entrepreneur, scientist and researcher.

Name of the Department- Mechanical Engineering

Program Outcomes (PO's)

PO 1	Acquire, demonstrate and apply advanced knowledge in the area of mechanical engineering.
PO 2	Identify problems in the field of mechanical engineering, formulate them and Solve by using advanced techniques.
PO 3	Conducting dependent research and generate new knowledge for the benefit of community, society Industry and country.
PO 4	Apply various numerical methods, advanced software and engineering tools to model, Analyze and solve mechanical engineering problems.
PO 5	Work effectively in interdisciplinary teams for solving real life problems in the related field.
PO 6	Apply engineering and scientific principles for the effective management of mechanical systems.
PO 7	Effectively communicate through Technical reports, presentations and scientific publications with the engineering community as well as society at large.
PO 8	Demonstrate traits of management in handling engineering projects, related finance, and coordinate with workforce towards achieving goals.
PO 9	Demonstrate high level of professional and intellectual integrity, ethics of research and scholarly standards.
PO 10	Examine critically the outcomes of one's actions and make Corrective measures subsequently.
PO 11	Demonstrate the ability to work in team in the laboratory in achieving multidisciplinary tasks required for the project.
PO 12	Engage in life-long reflective and independent learning with high level of Enthusiasm and commitment.

Program Educational Objectives (PEOs)

No.	PEO
PEO1	To train students with in depth and advanced knowledge to become professional and capable of identifying, analyzing and solving complex problems in the areas Heat power engineering.
PEO2	To enable post graduates to carry out innovative and independent research work, disseminate the knowledge in Academia/Industry/Research Organizations to velop systems and processes in the related field.
PEO3	To prepare the students to exhibit a high level of professionalism, integrity, effective communication skills and environmental and social responsibility.
PEO4	To provide an academic environment that gives adequate opportunity to the students to cultivate life-long independent learning ability for their successful professional career.

COURSE OUTCOMES
(CO's)
(PG)

Name of the Department- Electrical Engineering

Course Outcomes

Semester: I **(M.Tech-I)**

Sr.No.	Subject Name	Course Outcome
1	**POWER SYSTEM MODELING**	1. Develop power system components modeling and analyze their performance 2. Develop modeling of synchronous machine and analyze its performance 3. Perform steady state and dynamic analysis on simulation models 4. Understand configuration and functioning of synchronous machine excitation system. 5. Develop excitation system components modeling and analyze their performance. 6. Understand and transmission line, load and reactive power compensator modeling.
2	**ADVANCED POWER ELECTRONICS**	1. Understand the behavior of power semiconductor devices operated as power switches. 2. analyze operation of various power converters 3. Understand advance power conversion techniques 4. Apply power conversion technology for exploring RES 5. Ability to design and test power electronic circuits in the laboratory
		1. Analyze dynamics of a linear system by State Space Representation. 2. Determine the stability of a linear system

3	**MODERN CONTROL SYSTEM**	using pole-placement technique. 3. Design state observers. 4. Analyze basics of Non-linear control system. 5. Determine the stability of Non-linear systems. 6. Formulate and solve deterministic optimal control problems in terms of performance indices. 7. Realize the structure of a discrete time system and model its action mathematically.
4	**ELECTRICAL TRANSIENTS IN POWER SYSTEM**	1. Understand basic concepts of travelling wave 2. Understand and analyze the electrical transients and effects on transmission line 3. Evaluate system parameters and model the overhead lines and underground cables 4. systems using advance digital computing tools.

Semester: II **(M.Tech-II)**

	Subject Name	**Course Outcomes**
1	**AC/ DC DRIVES**	1. Explain the basics of Electrical Drives. 2. Develop the closed loop controlled DC drives. 3. Describe the modern trends of DC Dives. 4. Explain the basics methods of speed control of Induction motor. 5. Apply the various speed control methods for controlling the speed of Induction motor. 6. Apply the various speed control methods for controlling the speed of synchronous motor. 7. Use vector control method for controlling

		the Induction motor drive.
2	**ADVANCED POWER SYSTEM PROTECTION**	1. Understand philosophy of various relays used in power system protection. 2. Understand basic principle of digital relaying
3	**DISTRIBUTED GENERATION AND MICROGRID**	1. Understand exploration of renewable energy sources 2. Understand philosophy of distributed generation 3. Understand various issues of DG with grid integration 4. Understand the concept of micro grid and various power quality issues.

Name of the Department- Mechanical Engineering

Course Outcomes

Semester: I **(M. tech-I)**

Sr. No.	Subject Name	Course Outcomes
1)	**Engineering Thermodynamics (MMECH11)**	1. Review the laws of thermodynamics 2. Explain the use of Maxwell's relations, Clapeyron equation and apply equations of state for real gases and compare. 3. Analysis of second law of thermodynamics for various processes. CO4. Analyze gas turbine cycles. 4. Illustrate the ideal gas, real gas, its deviation with compressibility chart
2)	**Machining and Forming Processes (MMECH12)**	1. Classify conventional and non-conventional machining processes. 2. Understand mechanism of metal cutting, introduction to tool life, cutting fluids. 3. Describe the mechanism and mechanics of grinding processes, various non-conventional machining processes. 4. Rolling, extrusion and wire drawing processes. 5. Forging in plain stain, calculations of forging loads in Closed die forging ,residual stresses in forgings, Forging defects 6. Sheet metal working processes.
3)	**Mechanical Vibrations (MMECH13)**	1. To develop in our students the ability to engage themselves to solve vibration problems. 2. To be creative problem solvers whilst dealing with machinery involving periodic phenomena 3. To integrate empirical analysis and add to the world of field expertise where possible 4. To adapt to recent advances in knowledge
4)	**Advanced Machine**	1. To analyze variance, factorial design and regression and

	Design (MDE14A)	understand reliability theory, design and analysis of reliability. 2. Students will have the ability to analyze behavior of mechanical elements under fatigue and creep 3. To study optimization and its methods. 4. To study composite materials and its characteristics. 5. To design mechanical components for various materials and process.
5)	**Utilization of Solar Energy: (MTE14B)**	1. Describe measurement of direct, diffuse and global solar radiations falling on horizontal and inclined surfaces, Basic earth sun angles, Beam and diffuse radiations, Radiation on titled surfaces. 2. Analyze the performance by conducting research on flat plate collector, air heater and concentrating type collector. 3. Understand test procedures and apply these while testing different types of collectors. 4. Demonstrate and Design various types of thermal energy storage systems. 5. Analyze payback period and annual solar savings due to replacement of conventional systems 6. Demonstrate the importance of solar energy effectively to increase awareness of it in society
6	**Advanced I.C. Engines (MTE14C)**	1. Demonstrate energy management principles, identify need, organizing it. carry out energy auditing. 2. Conduct economic analysis of any industry or power plant, obtain conclusion and suggest it to industry. 3. Interpret financial appraisal methods, and thermodynamic analysis, and estimate financial budget of visited industry.
7	**Additive Manufacturing (MME14D)**	1. Understand the importance of Additive Manufacturing 2. Classify the different AM processes 3. Design for AM processes 4. Understand the applications of AM 5. Apply the AM Processes bio-medical applications

8	**Manufacturing Planning and Control (MMECH15A)**	1. Apply the systems concept for the design of production and service systems. 2. Make forecasts in the manufacturing and service sectors using selected quantitative and qualitative techniques. 3. Apply the principles and techniques for planning and control of the production and service systems to optimize/make best use of resources. 4. Understand the importance and function of inventory and to be able to apply selected techniques for its control and management under dependent and independent demand circumstances. 5. Understand the lot sizing and production scheduling. 6. Study about quality planning, cost planning and control.
9	**Hydraulic, Pneumatic and Fluidic Control (ME-XX15C)**	1. Understand the type of control system and their utility 2. Describe the hydraulic power generation 3. Design pneumatic and hydraulic circuits for a given application 4. Discuss steady state operating forces, transient forces and valve instability 5. Design of pure fluid digital elements, Lumped and distributed parameter fluid systems
10	**Wind Energy (MTE15D)**	1. Identify and describe history of wind energy and its scope in future. 2. Survey and analyze through a literature review world distribution of wind, Weibull 25 statistic, variation in wind energy etc., 3. Conduct an experiment to use various wind energy measurement indicators, anemometers, and apply it to analyze and check data obtained from surveys. 4. Demonstrate and calculate performance parameters wind energy turbine. 5. Illustrate various electrical systems used in wind energy power plant. 6. Examine and justify economics of wind system.

11	**Finite Element Method (MME15E)**	1. Understand the basics principle of FE method 2. Identify mathematical model for solution of common problems CO3 Solve structural, thermal problem using FE in 1D Case 3. Derive element stiffness matrix by different methods 4. Understand the formulation for 2D and 3D case 5. Recognize need for and engage in lifelong learning
12	**Communication Skills (BSH16)**	1. Understand the basics principle of communication 2. Develop presentation skill techniques
13	**Mechanical Engineering Lab (MMECH17)**	1. Conduct test on hydraulic turbines like Pelton wheel, Francis turbine, IC Engines, Refrigeration 2. and air conditioning test units, solar system etc. to study their performance and analyze the result. 3. Draw and analyze performance curves of these machines/systems. 4. Analyze the results obtained from the tests.

SEMETER-II **(M.TECH.-II)**

Sr. No.	Subject Name	Course Outcomes
1)	**Advanced Fluid Mechanics and Heat Transfer (MMECH21)**	1. Analyze steady state and transient heat conduction problems of real life Thermal systems 2. Analyze extended surface heat transfer problems and problems of phase change heat transfer like boiling and condensation 3. Apply the basic principles of classical heat transfer in real engineering application 4. Analyze the analytical and numerical solutions for heat transfer problem. 5. Understand the basic concepts of turbulence and their impact on heat transfer 6. Analyze convective heat transfer in common geometries

		like tube, plate, cylinder
2)	**Mechanical Design Analysis (MMECH22)**	1. To analyze variance, factorial design and regression and understand reliability theory, design and analysis of reliability. 2. Students will have the ability to analyze behavior of mechanical elements under fatigue and creep 3. To study optimization and its methods. 4. To study composite materials and and its characteristics. 5. To design mechanical components for various materials and process
3)	**Numerical Methods and Computational Techniques (MMECH23A)**	1. Describe the concept of error 2. Illustrate the concept of various Numerical Techniques 3. Evaluate the given Engineering problem using the suitable Numerical Technique 4. Develop the computer programming based on the Numerical Techniques
4)	**CAD-CAE (ME-XX23B)**	1. Demonstrate - Polynomial and spline interpolation, Bezier curves, B-splinesto surfaces representation, patches and composite surfaces. 2. Design and create Solid model assembly of thermal and fluid engineering system in CAD software. 3. Analyze simple Engineering problem by selecting appropriate Mesh generation. 4. Modeling and Meshing of Thermal and Fluid Flow equipment in CAD. 5. Simulate and demonstrate Thermal and Fluid systems by using ANSYS, EES, MATLAB etc. 6. Understand and simulate computer aided manufacturing
5)	**Computational Fluid Dynamics (MTE23B)**	1. Identify applications of finite volume and finite element methods to solve Navier-Stokes

		equations. 2. Evaluate solution of aerodynamic flows. Appraise & compare current CFD software. Simplify flow problems and solve them exactly. 3. Design and setup flow problem properly within CFD context, performing solid using CAD package and producing grids via meshing tool. 4. Interpret both flow physics and mathematical properties of governing Navier-Stokes equations and define proper boundary conditions for solution. 5. Use CFD software to model relevant engineering flow problems. Analyse the CFD results. Compare with available data, and discuss the findings
6	**Advanced Refrigeration (MTE23C)**	1. Formulate and solve vapor compression refrigeration and multi-stage vapor compression systems. 2. Study and identify various types of refrigerants and their properties., such as zeotropic, azeotropic etc., 3. Illustrate Nomenclature, Refrigerants, alternative refrigerants, CFC/HCFC phase-out regulations, action with lubricating oil, retrofitting, refrigerant blends, effects on refrigeration components. 4. Design and analyze vapor absorption system 5. Select refrigerant control techniques,and do piping designing for refrigeration plant
7	**Design of Heat Exchangers (MTE23D)**	1. Demonstrate and of heat exchanger design methodology, and design considerations 2. Analyze performance of Heat exchanger by applying basic design theory. 3. Design and conduct experiment on one from double pipe, shell and tube, tube fin, plate type and plate-fin heat exchanger. 4. Demonstrate selection criteria of HEX and

		conduct an independent research to suggest suitable HEX. 5. Model and illustrate heat exchanger based on I-law and irreversibility. CO6 Study and analyze losses in HEX, and upcoming advancements.
8	**Alternative Fuels for IC Engine (MTE23E)**	1. Demonstrate Structure of petroleum, Refining process, Products of refining process, Select suitable fuels for use in SI engines. Understand various performances rating in SI engines. 2. Illustrate properties of petroleum products and classify them on their characteristic. 3. Describe and analyze Need for alternative fuels such as Ethanol, Methanol, LPG, CNG, Hydrogen and their manufacturing procedure. 43 4. calculate and estimate performance and emission characteristics of alternative fuels 5. Analyze environmental effects of combustion of various fuels, suggest modification in their usage.
9	**Steam and Gas Turbines (MTE24A)**	1. Illustrate properties of Steam, Draw P-V, T-s, H-s(Mollier) diagrams for steam, Describe Theoretical steam turbine cycle. 2. Demonstrate and analyze vortex flow, energy lines and reheat factors of steam turbines. Solve problems of finding performance steam turbine power plant. 3. Demonstrate simple Brayton cycle for gas turbine analyze its performance on computer simulation, suggest suitable modification and then analyze it. 4. Study and apply various Performance Improvement Techniques in steam and gas Turbines 5. Design and suggest and analyze cooling accessories and protective material for steam turbine. 6. Visit thermal power plant and enumerate performance and maintenance and

		troubleshooting criteria for steam turbine
10	**Cryogenic Engineering (MTE24B)**	1. Demonstrate and identify role of cryogenics in the industrial applications. 2. Describe mechanical, thermal, thermo-electric properties of cryogenic fluids. 3. Illustrate Ideal separation, properties of mixtures, Rectifiers column, separation of air, purification. 4. List and give details about various types of cryogenic refrigeration system, such as J-T Refrigeration systems, Philips refrigerator, Vuilleumier refrigerator, Solve refrigerator, G-M refrigerator 5. Study and describe Insulation and storage systems in cryogenic engineering
11	**Surface Engineering (MME24B)**	1. Learn the importance and need of surface engineering. 2. Describe various surface cleaning and modification techniques. 3. Understand the concepts of surface integrity. 4. Compare various surface coating technologies. 5. Select appropriate method of coating for a given application. 6. Apply measurement techniques and carry out characterization of coated surfaces.
12	**Nanotechnology (MMECH24C)**	1. Demonstrate the understanding of length scales concepts, nanostructures and nanotechnology. 2. Identify and to compare various synthesis and characterization techniques involved in Nanotechnology. 3. Define and interpret the interactions at molecular scale. 4. Evaluate and analyze the mechanical properties of bulk nano-structured metals and alloys, nano-composites and carbon nanotubes.

		5. Compare andanalyze the effects of using nanoparticles over conventional methods
13	**World Class Manufacturing (MME24F)**	1. Define challenges in world class manufacturing 2. Study various world class manufacturing strategies. 3. Understand total quality and employee involvement in manufacturing. 4. Discuss different world class information system for change management. 5. Identify various methods and processes for WCM using brain storming. 6. Describe method to monitor performance in WCM
14	**Research Methodology (MOE25A)**	1. Understand and Describe importance of research. 2. Classify and select appropriate resources for Research. 3. Analyze the contents of literature and identify further scope. 4. Formulate a Research Problem. 5. Develop effective written and oral Presentation skills.
15	**Design of Experiments (MOE25B)**	1. Define Taguchi, factorial experiments, variability, orthogonal array, quality loss. 2. Plan and design the experimental investigations efficiently and effectively. 3. Understand strategy in planning and conducting experiments. 4. Evaluate variability in the experimental data using ANOVA. 5. Practice statistical software to achieve robust design of experiments.
16	**Advanced Optimization Techniques (MOE25C)**	1. Enables to acquire mathematical methods and apply in engineering disciplines.

		2. Apply methods of optimization to solve a linear,non-linear programming problem by various methods 3. Optimize engineering problem of nonlinear-programming with/without constraints, by using this technique. 4. Use of dynamic programming problem in controlling in industrial managements. 5. Simulate Thermal engineering system problem. Understand integer programming and stochastic programming to evaluate advanced optimization techniques.
17	**Environmental Engineering and Pollution Control (MOE25D)**	1. Identify effects of industrialization on environmental pollution in various field. 2. Describe photochemical smog, acid Rain, Greenhouse effect, ozone depletion, global warming. 3. Suggest pollution control techniques for vehicles, refrigeration, industries, chemical and power plant. 4. Do Case study on any industry and analyze carbon exertion rate, water pollution, soil pollution etc. 5. Design pollution control devices for vehicle, analyze and find out replacement CFC refrigerant with HC refrigerant
18	**Seminar (MMECH26)**	1. Identify the topic for seminar from the recent areas and technologies in thermal and fluids engineering or related areas. 2. Carry out detailed comprehensive survey of the literature related to the topic selected. Use information available from various sources like research papers, patents, websites, discussion with experts on the topic etc. 3. Comprehend the information, organize it and write technical report. Give presentations on the

		topic to the group of students. 4. Identify and report latest developments and unresolved issues in the selected topic/area. 5. Analyze the impact of the technologies on the environment. Identify green technologies related to selected topic.
19	**Mini Project (MMECH27)**	1. Identify methods and materials to carry out experiments/develop code. 2. Reorganize the procedures with a concern for society, environment and ethics. 3. Analyze and discuss the results to draw valid conclusions. CO4 Prepare a report as per recommended format and defend the work 4. Explore the possibility of publishing papers in peer reviewed journals/conference proceedings.

SEMETER-III **(M.TECH.-III)**

Sr. No.	Subject Name	Course Outcomes
1)	**Intellectual Property Rights (MMECH32)**	1. Enumerate and demonstrate fundamental terms such as copy-rights ,Patents ,Trademarks etc., 2. Interpret and follow Laws of copy-rights, Patents, Trademarks and various IP registration Processes to register own project research. 3. Exhibit the enhance capability to do economic analysis of IP rights, technology and innovation related policy issues and firms' commercial strategies. 4. Develop awareness at all levels (research and innovation) of society to develop patentable technologies. 5. Apply trade mark law, copy right law, patent law and also carry out intellectual property audits 6. Manage and safeguard the intellectual property and protect it against unauthorized use

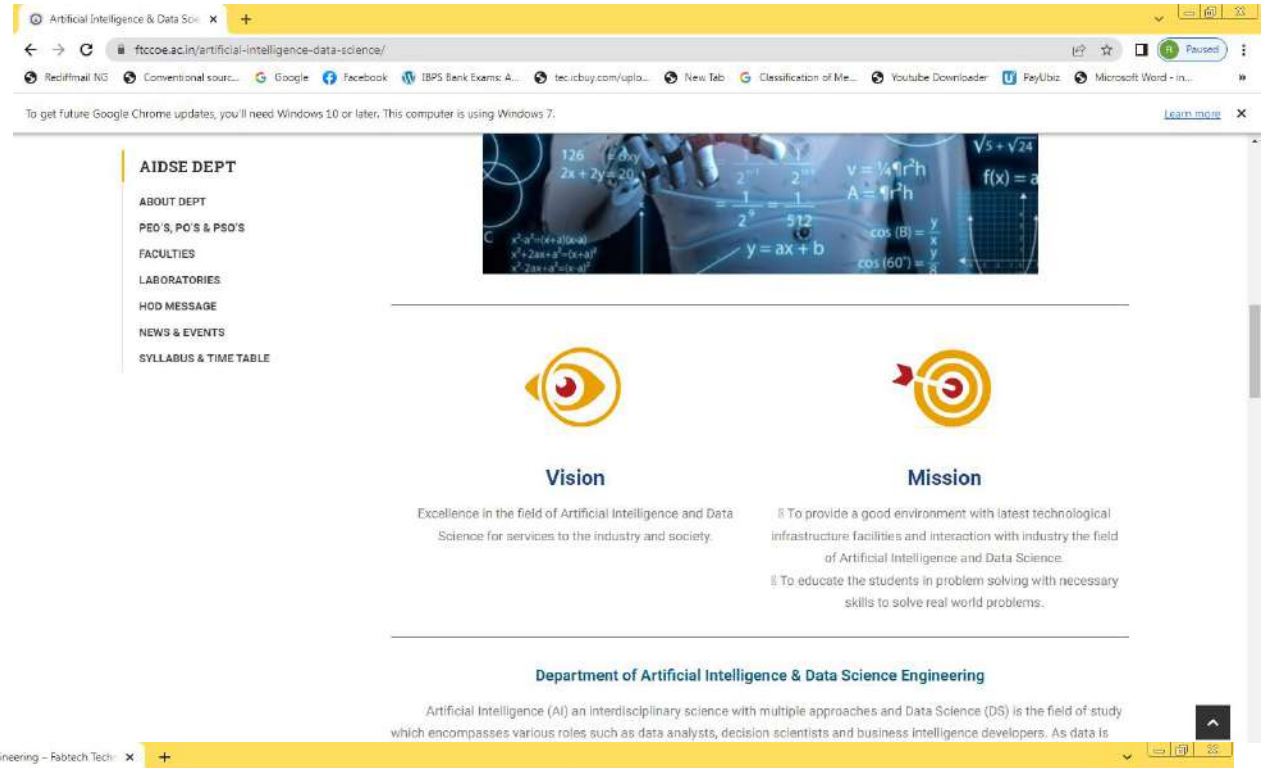
2)	**Project Stage-I (MMECH33)**	1. Identify problems and to plan methodologies to solve problems. 2. Carry out exhaustive literature review, study &evaluate collected literature critically and identify the gaps based on the review. 3. Select the specific problem for the study as a project 4. Demonstrate technical writing while preparing project report and present it to evaluation committee to demonstrate presentation skills acquired

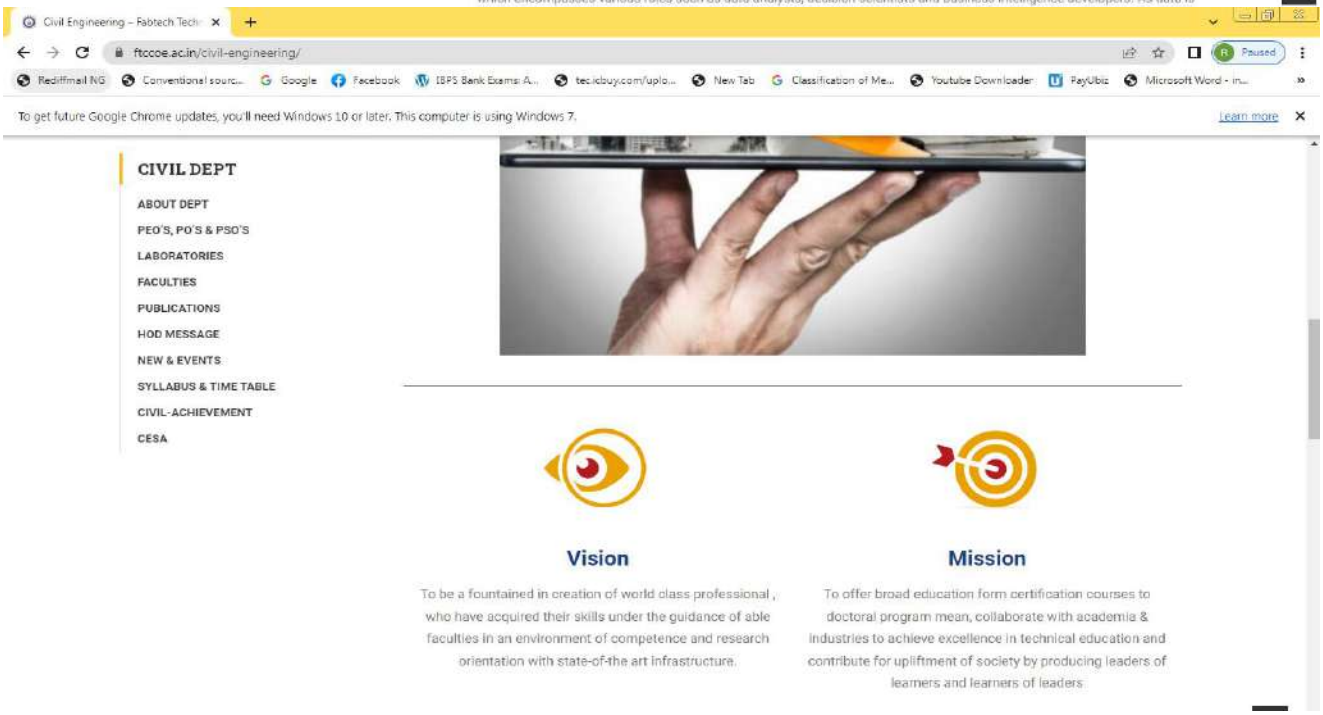
SEMETER-IV **(M.TECH-IV)**

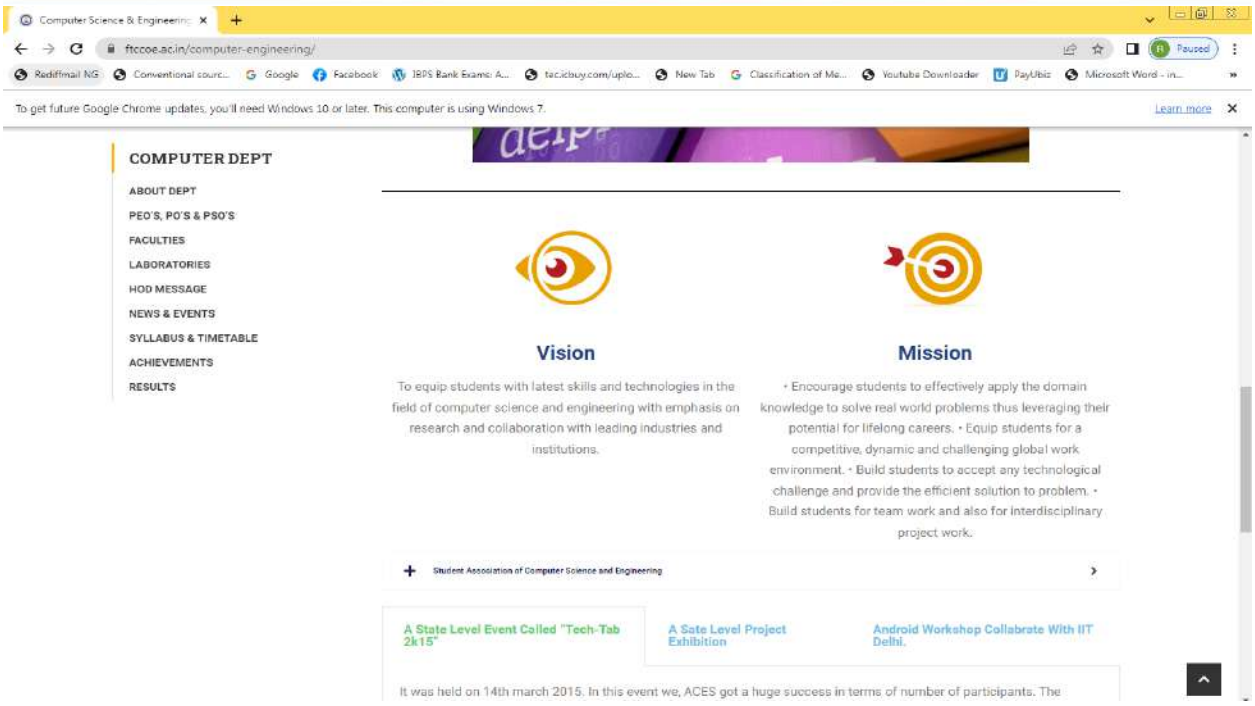
Sr. No.	Subject Name	Course Outcomes
1)	**Project Stage-II (MMECH41)**	1. Solve identified technical problem using acquired knowledge and skill. 2. Use latest equipment, instruments, software tools, infrastructure and learning resources available to solve the identified project problem. Procure resources, if required. 3. Interpret theoretical/experimental findings using available tools 4. Compare the results obtained with results of similar studies 5. Draw conclusions based on the results.

Vision and Mission statements are displayed on the college website and various places like entrance of the College, Corridor, Principal Cabin, Trustee Cabin, Library and Seminar Hall, IQAC Office etc.

➢ Vision, Mission Display on College Website:



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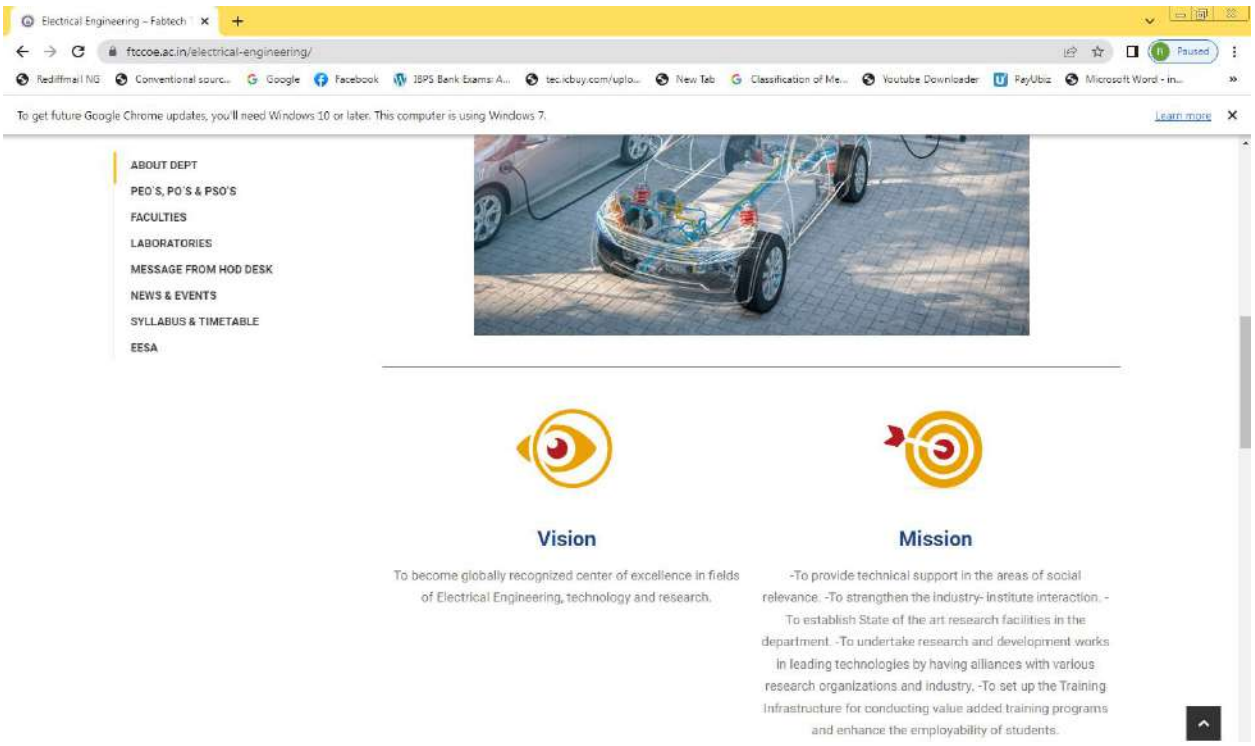
Vision
To equip students with latest skills and technologies in the field of computer science and engineering with emphasis on research and collaboration with leading industries and institutions.
Mission
• Encourage students to effectively apply the domain knowledge to solve real world problems thus leveraging their potential for lifelong careers. • Equip students for a competitive, dynamic and challenging global work environment. • Build students to accept any technological challenge and provide the efficient solution to problem. • Build students for team work and also for interdisciplinary project work.
Student Association of Computer Science and Engineering
A State Level Event Called "Tech-Tab 2k15"
A Sate Level Project Exhibition
Android Workshop Collabrate With IIT Delhi.
It was held on 14th march 2015. In this event we, ACES got a huge success in terms of number of participants. The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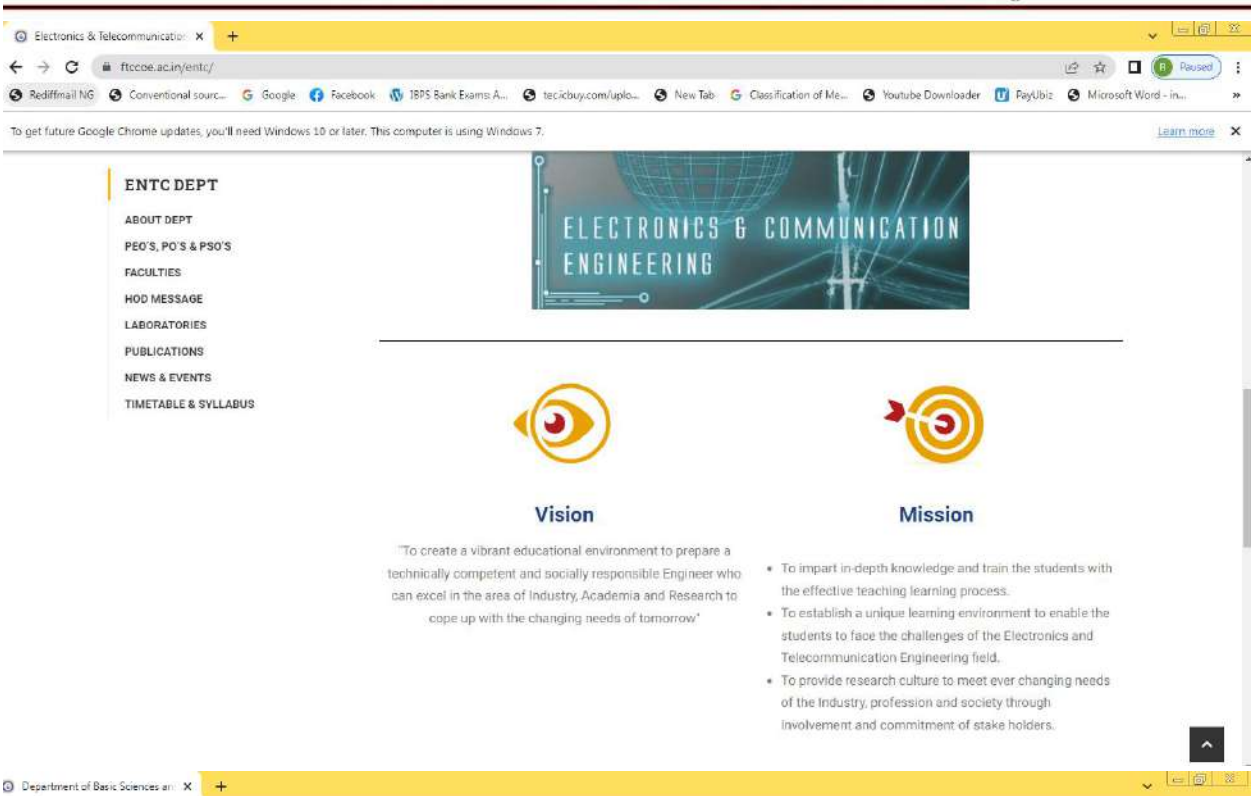
EESA
Vision
To become globally recognized center of excellence in fields of Electrical Engineering, technology and research.
Mission
-To provide technical support in the areas of social relevance. -To strengthen the industry- institute interaction. -To establish State of the art research facilities in the department. -To undertake research and development works in leading technologies by having alliances with various research organizations and industry. -To set up the Training Infrastructure for conducting value added training programs and enhance the employability of students.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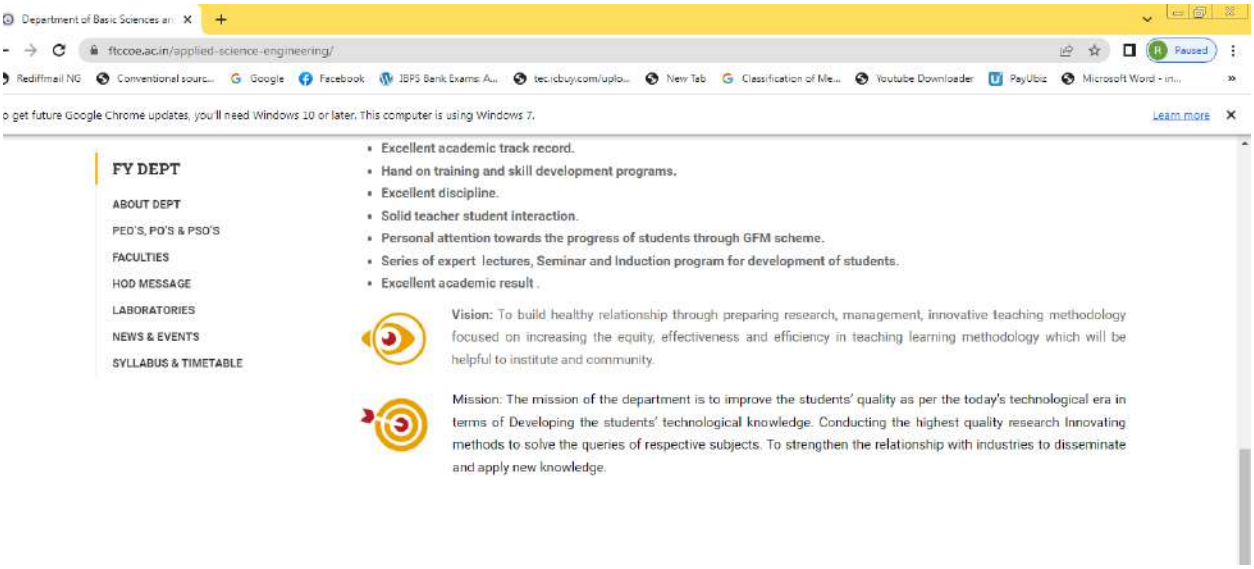
ELECTRONICS & COMMUNICATION ENGINEERING
Vision
"To create a vibrant educational environment to prepare a technically competent and socially responsible Engineer who can excel in the area of Industry, Academia and Research to cope up with the changing needs of tomorrow"
Mission
To impart in-depth knowledge and train the students with the effective teaching learning process.
To establish a unique learning environment to enable the students to face the challenges of the Electronics and Telecommunication Engineering field.
To provide research culture to meet ever changing needs of the Industry, profession and society through involvement and commitment of stake holders.


Department of Basic Sciences an
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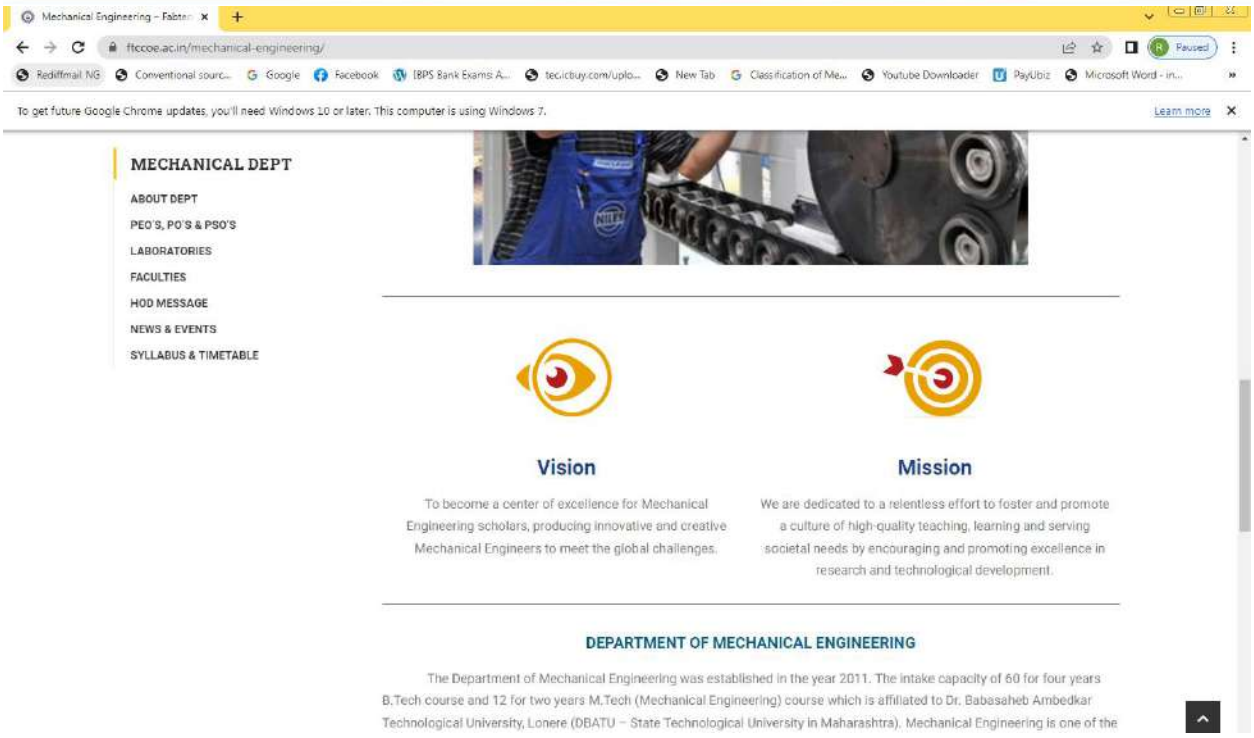
Excellent academic track record.
Hand on training and skill development programs.
Excellent discipline.
Solid teacher student interaction.
Personal attention towards the progress of students through GFM scheme.
Series of expert lectures, Seminar and Induction program for development of students.
Excellent academic result .
Vision: To build healthy relationship through preparing research, management, innovative teaching methodology focused on increasing the equity, effectiveness and efficiency in teaching learning methodology which will be helpful to institute and community.
Mission: The mission of the department is to improve the students' quality as per the today's technological era in terms of Developing the students' technological knowledge. Conducting the highest quality research Innovating methods to solve the queries of respective subjects. To strengthen the relationship with industries to disseminate and apply new knowledge.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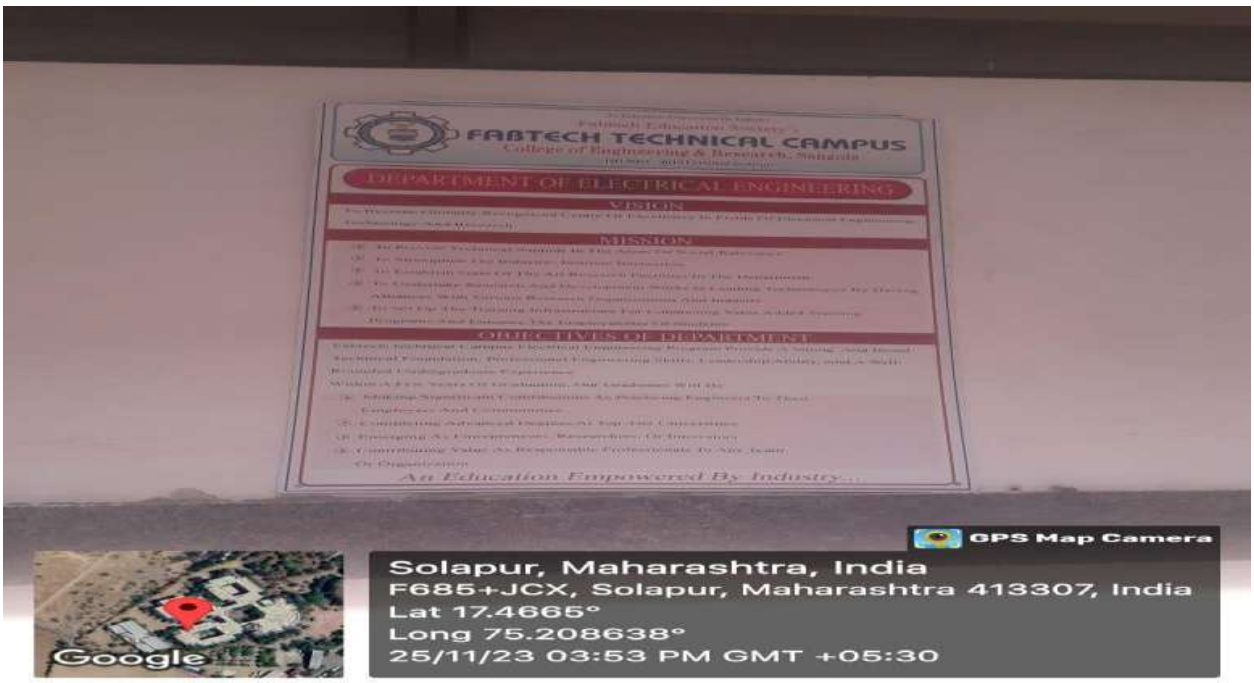
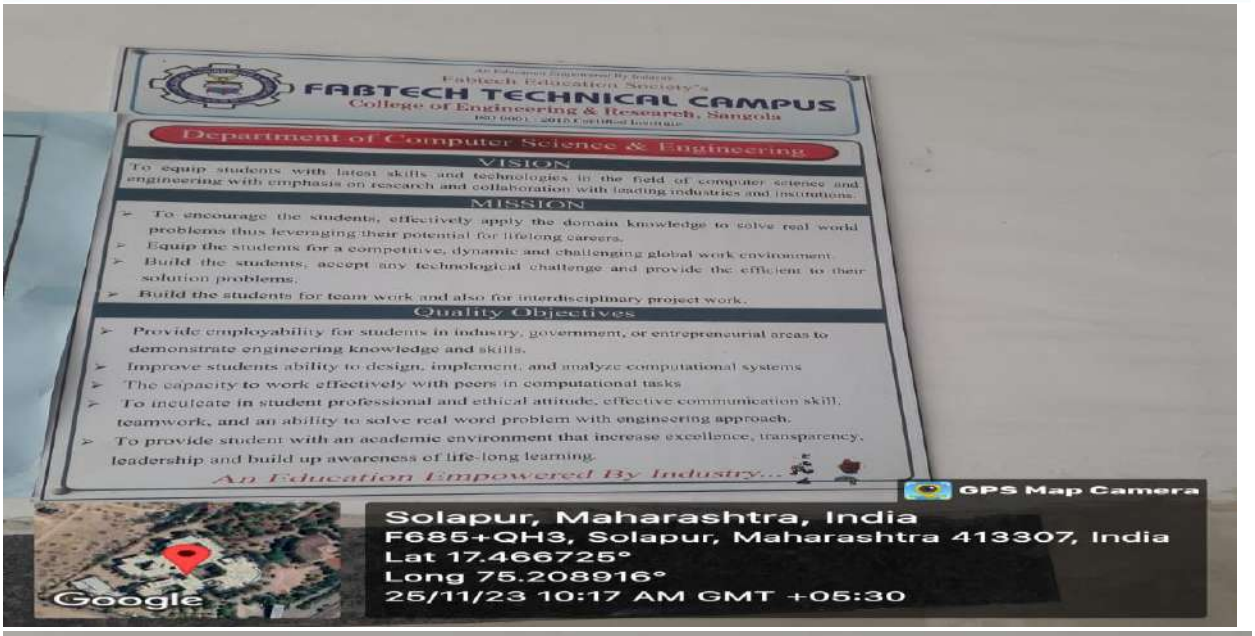
Vision
To become a center of excellence for Mechanical Engineering scholars, producing innovative and creative Mechanical Engineers to meet the global challenges.
Mission
We are dedicated to a relentless effort to foster and promote a culture of high-quality teaching, learning and serving societal needs by encouraging and promoting excellence in research and technological development.
DEPARTMENT OF MECHANICAL ENGINEERING
The Department of Mechanical Engineering was established in the year 2011. The intake capacity of 60 for four years B.Tech course and 12 for two years M.Tech (Mechanical Engineering) course which is affiliated to Dr. Babasaheb Ambedkar Technological University, Lonere (DBATU – State Technological University in Maharashtra). Mechanical Engineering is one of the

- **Vision, Mission Display in departments:**




FABTECH TECHNICAL CAMPUS
College of Engineering & Research, Sangola
Department of Computer Science & Engineering
VISION
To equip students with latest skills and technologies in the field of computer science and engineering with emphasis on research and collaboration with leading industries and institutions.
MISSION
To encourage the students, effectively apply the domain knowledge to solve real world problems thus leveraging their potential for lifelong careers.
Equip the students for a competitive, dynamic and challenging global work environment.
Build the students, accept any technological challenge and provide the efficient to their solution problems.
Build the students for team work and also for interdisciplinary project work.
Quality Objectives
Provide employability for students in industry, government, or entrepreneurial areas to demonstrate engineering knowledge and skills.
Improve students ability to design, implement, and analyze computational systems
The capacity to work effectively with peers in computational tasks
To inculcate in student professional and ethical attitude, effective communication skill, teamwork, and an ability to solve real word problem with engineering approach.
To provide student with an academic environment that increase excellence, transparency, leadership and build up awareness of life-long learning.
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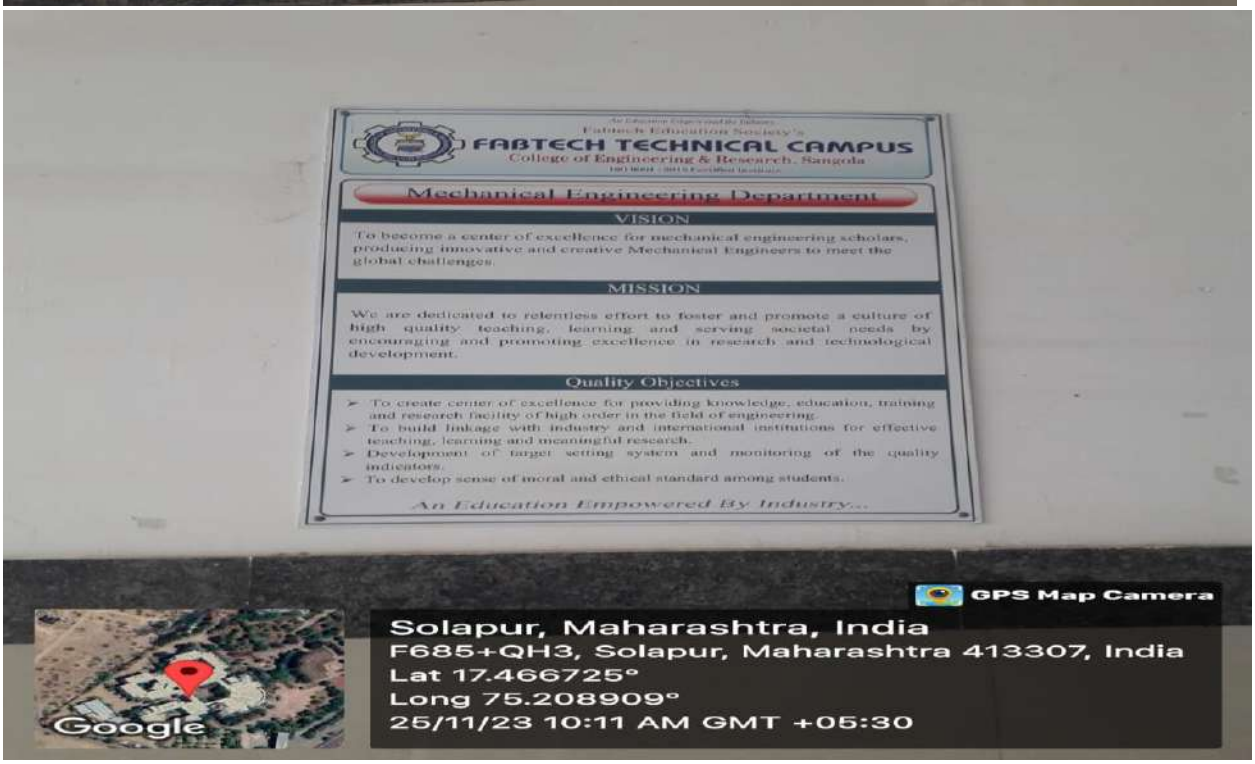
FABTECH TECHNICAL CAMPUS
College of Engineering & Research, Sangola
Mechanical Engineering Department
VISION
To become a center of excellence for mechanical engineering scholars, producing innovative and creative Mechanical Engineers to meet the global challenges.
MISSION
We are dedicated to relentless effort to foster and promote a culture of high quality teaching, learning and serving societal needs by encouraging and promoting excellence in research and technological development.
Quality Objectives
To create center of excellence for providing knowledge, education, training and research facility of high order in the field of engineering.
To build linkage with industry and international institutions for effective teaching, learning and meaningful research.
Development of target setting system and monitoring of the quality indicators.
To develop sense of moral and ethical standard among students.
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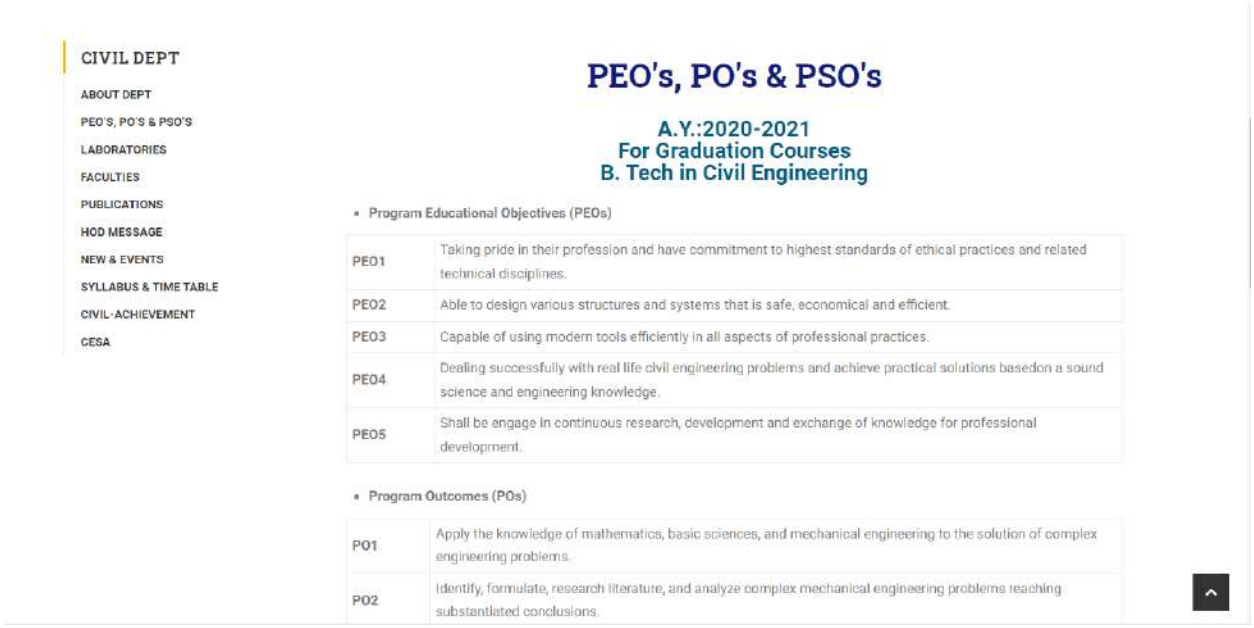
Programme Educational Objectives (PEOs), Programme Outcomes (POs), Programme Specific Outcomes (PSOs) and Course Outcomes (COs) have been defined by College. PEOs, POs and PSOs are disseminated on college website, at the entrance of the College, Corridor, Principal Cabin and Course Files of Teachers.

- **PEOs, POs and PSOs are disseminated on college website:**

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B. Tech in Computer Science Engineering
• Program Educational Objectives (PEOs)
Objective, Identifier
Objectives
PEO1
To provide knowledge of sound mathematical principles underlying various programming concepts.
PEO2
To develop an ability to understand complex issues in the analysis, design, implementation and operation of information systems.
PEO3
To provide knowledge of mechanisms for building large-scale computer-based systems.
PEO4
To develop an ability to provide computer-based solutions to the problems from other disciplines of science and engineering.
PEO5
To impart skills necessary for adapting rapid changes taking place in the field of information and communication technologies.
PEO6
To provide knowledge of ethical issues arising due to deployment of information and communication technologies in the society on large scale.


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Program Educational Objectives (PEOs)


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For Graduation Courses
B. Tech in Electrical Engineering
Program Educational Objectives (PEOs)
PEO1 Will exhibit strong technical ability and creativity to formulate alternative solutions to various electrical Engineering problems with available resources.
PEO2 Will demonstrate good interpersonal communication, team spirit and leadership in their profession.
PEO3 Will follow ethical approach and engage themselves in lifelong learning to meet societal needs and global challenges.
PEO4 Will exhibit industry ready abilities and skills.
Program Outcomes (POs)
PO1 Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2 Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
Design/development of solutions: Design solutions for complex engineering problems and design system


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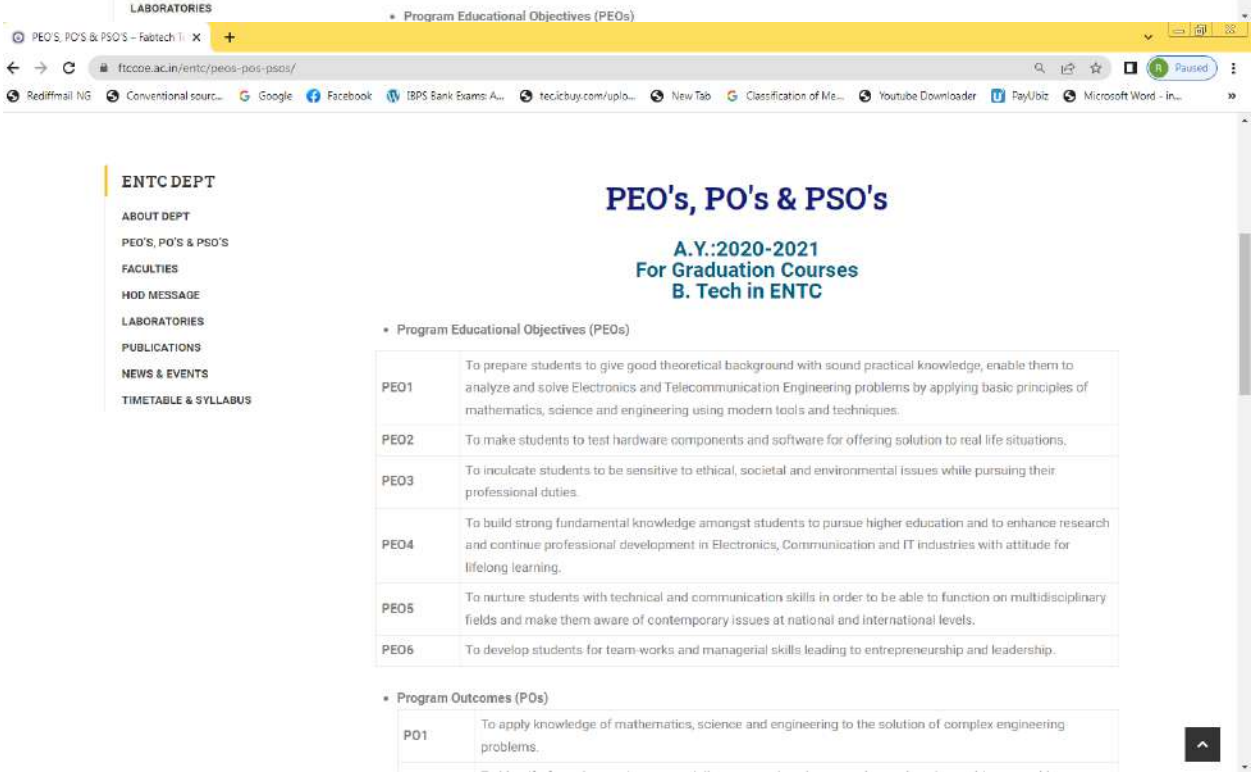
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• Program Educational Objectives (PEOs)

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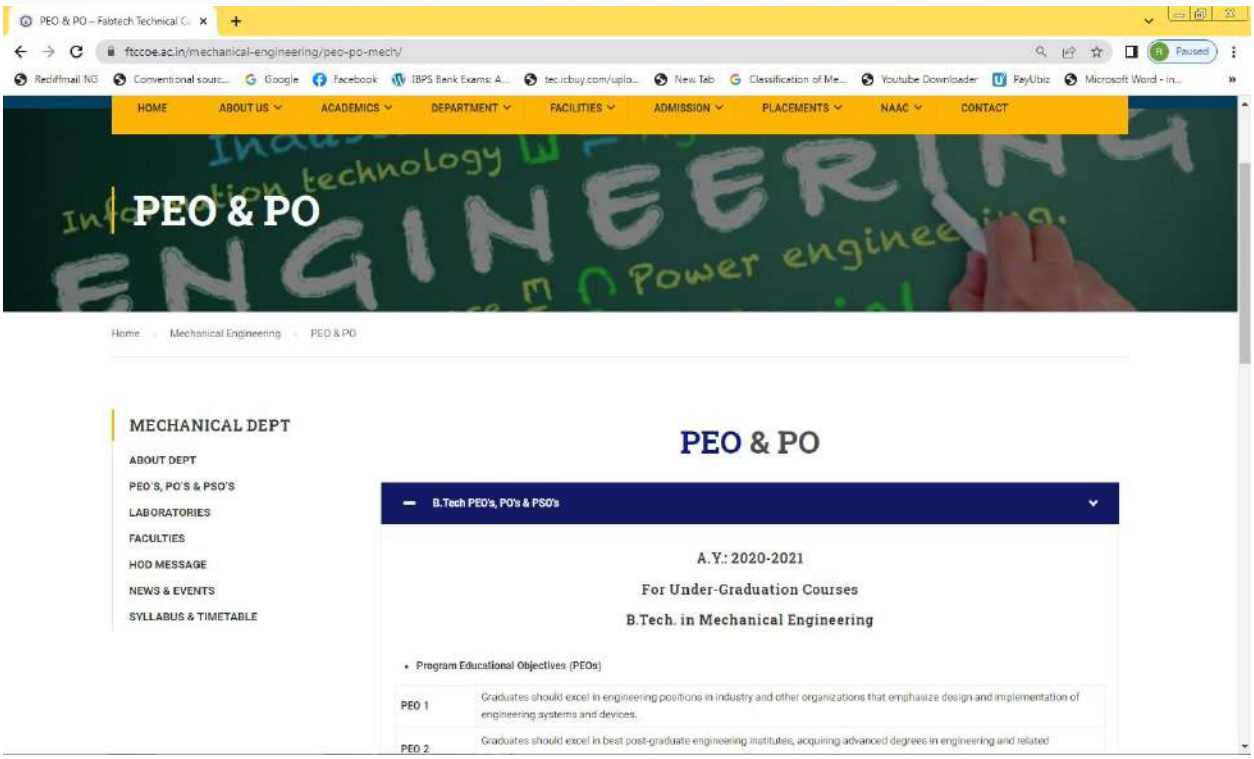
For Graduation Courses
B. Tech in ENTC
• Program Educational Objectives (PEOs)
PEO1 To prepare students to give good theoretical background with sound practical knowledge, enable them to analyze and solve Electronics and Telecommunication Engineering problems by applying basic principles of mathematics, science and engineering using modern tools and techniques.
PEO2 To make students to test hardware components and software for offering solution to real life situations.
PEO3 To inculcate students to be sensitive to ethical, societal and environmental issues while pursuing their professional duties.
PEO4 To build strong fundamental knowledge amongst students to pursue higher education and to enhance research and continue professional development in Electronics, Communication and IT industries with attitude for lifelong learning.
PEO5 To nurture students with technical and communication skills in order to be able to function on multidisciplinary fields and make them aware of contemporary issues at national and international levels.
PEO6 To develop students for team-works and managerial skills leading to entrepreneurship and leadership.
• Program Outcomes (POs)
PO1 To apply knowledge of mathematics, science and engineering to the solution of complex engineering problems.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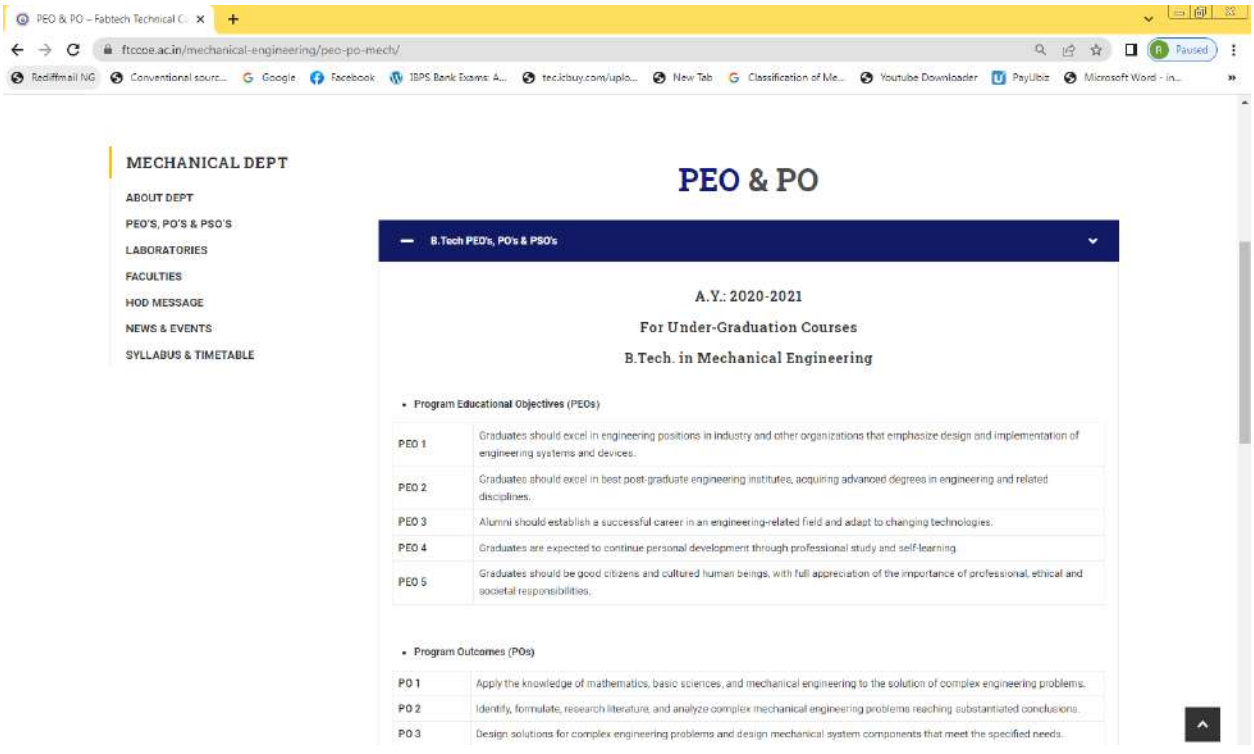
For Under-Graduation Courses
B.Tech. in Mechanical Engineering
Program Educational Objectives (PEOs)
PEO 1
Graduates should excel in engineering positions in industry and other organizations that emphasize design and implementation of engineering systems and devices.
PEO 2
Graduates should excel in best post-graduate engineering institutes, acquiring advanced degrees in engineering and related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For Under-Graduation Courses
B.Tech. in Mechanical Engineering
Program Educational Objectives (PEOs)
PEO 1
Graduates should excel in engineering positions in industry and other organizations that emphasize design and implementation of engineering systems and devices.
PEO 2
Graduates should excel in best post-graduate engineering institutes, acquiring advanced degrees in engineering and related disciplines.
PEO 3
Alumni should establish a successful career in an engineering-related field and adapt to changing technologies.
PEO 4
Graduates are expected to continue personal development through professional study and self-learning.
PEO 5
Graduates should be good citizens and cultured human beings, with full appreciation of the importance of professional, ethical and societal responsibilities.
Program Outcomes (POs)
PO 1
Apply the knowledge of mathematics, basic sciences, and mechanical engineering to the solution of complex engineering problems.
PO 2
Identify, formulate, research literature, and analyze complex mechanical engineering problems reaching substantiated conclusions.
PO 3
Design solutions for complex engineering problems and design mechanical system components that meet the specified needs.

- **PEOs, POs and PSOs are display in department:**


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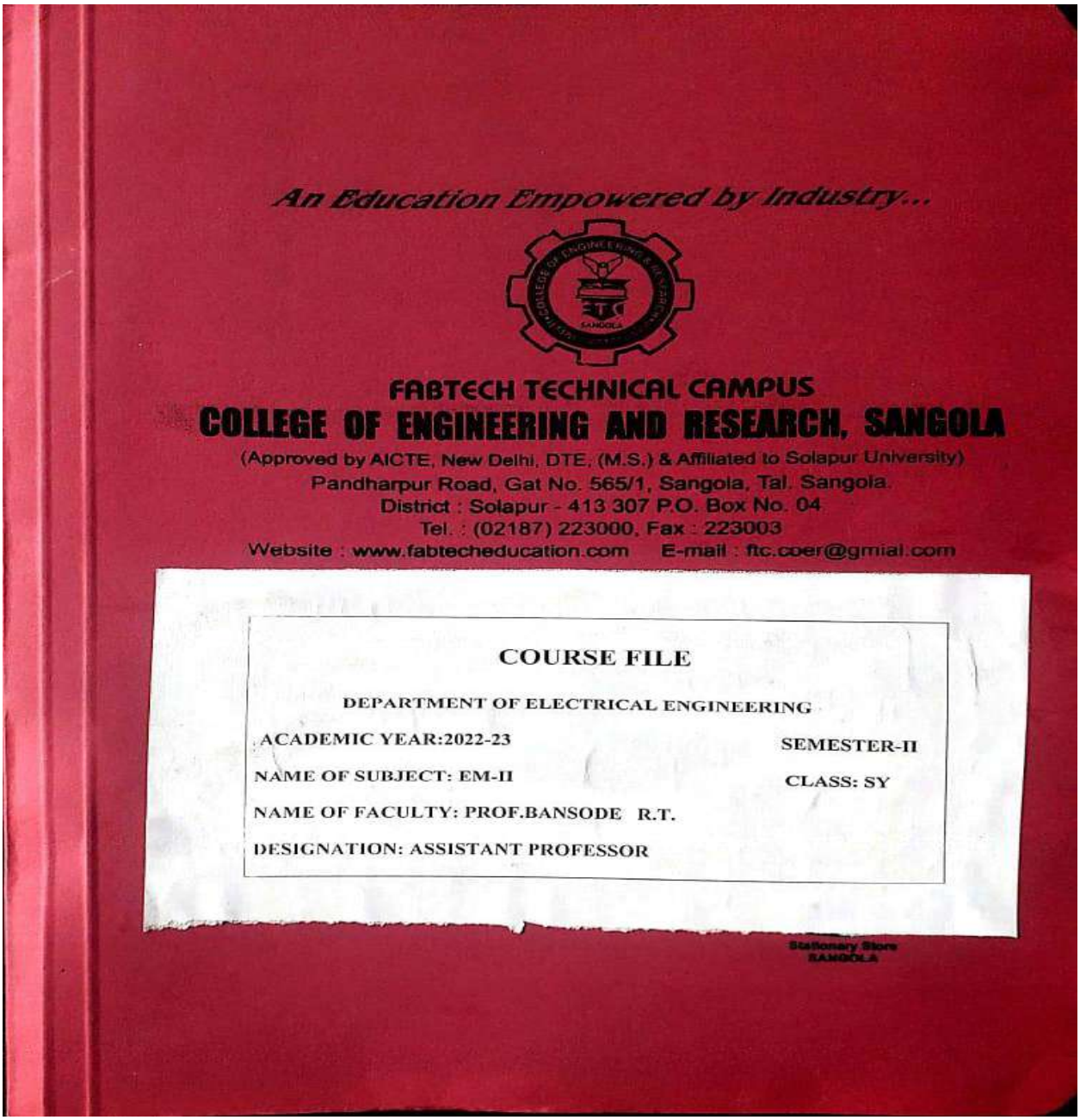
The course outcomes are written by the respective faculty member. All the faculty members were maintaining COs in their course files. COs are discussed by faculty members in the classrooms during introductory lecture of respective Subject /Course.

- **Cos are writen in faculty course file:**



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Pandharpur Road, Gat No. 565/1, Sangola, Taluka:- Sangola, District:- Solapur. - 413 307. P.O. Box No. 04
Contact No. : 8408888657 Website: www.fabtecheducation.com E-mail : ftc.coer@gmail.com

A.Y.:2022-2023
For Graduation Courses
B. Tech in Electrical Engineering

Department: Electrical Engineering **Class : S.Y.**

Subject: Electrical Machine-II

Course Objectives	CO1	To study the principle of operation and the effect of pulsating, rotating magnetic fields on the working of AC machines
	CO2	To understand armature winding layouts and concept of armature reaction with phasor diagrams.
	CO3	To study the different starting, speed control methods and equivalent circuit diagram of poly phase and single phase machines.
	CO4	To study effect of variation of field current upon the stator current and power factor of synchronous motor and Plot V-Curve and inverted V-Curve of synchronous motor for different values of loads.
	CO5	To know the different types of special machines apart from the conventional ac motors.

COURSE OUTCOMES:

CO1	Relate spatially displaced armature windings for the generation of various magnetic fields in AC machines
CO2	Identify different types of armature windings and winding factors for calculating induced EMF
CO3	Illustrate the electromagnetic laws for the operation of three phase synchronous and asynchronous machines.
CO4	Describe different tests for calculating the performance parameters of three phase induction motors.
CO5	Explain the fundamental control practices like starting, reversing and speed control strategies for different applications.

CO6	Describe the different methods for the computation of voltage regulation of an alternator.
CO7	Demonstrate the parallel operation of alternators for load sharing under various loading conditions.
CO8	Illustrate the effect of excitation and variation of loads on armature current and power factor.
CO9	Demonstrate the behavior of synchronous motor for estimation of armature current and power factor at different excitations and loading conditions
CO10	Explain the double revolving, cross field theory for working of the single phase induction motor.