



M.S.P. Mandal's

**Shri Shivaji Institute of Engineering & Management Studies,
Vasmat Road, Parbhani – 431 401 (M.S.).**

Ph. (02452) 234109, Fax (02452) 221958

Email: director.ssiems@gmail.com web: www.ssiems.org.in

DTE Code: 2252

University Code: 2252

APPLIED SCIENCE & HUMINITIES DEPARMENT

Program Outcomes (PO)

Engineering Graduate will be able to –

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **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.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specific needs with appropriate consideration for the public health and safety, and the cultural, social, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **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.
6. **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.
7. **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.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **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.
11. **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.

12. **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.



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CIVIL ENGINEERING DEPARTMENT

Programme Outcomes (PO)

- PO 1** Apply the basic knowledge of mathematics, science and engineering to solve the civil engineering problems.
- PO 2** Assess societal, health, safety, cultural issues and responsibility related to civil engineering problem.
- PO 3** Demonstrate the ability to design and conduct experiments, interpret and analyze the data and report results.
- PO 4** Select and use appropriate modern civil engineering tools to analyze and solve civil engineering problems.
- PO 5** Design solution for complex civil engineering problem that will satisfy the specific need.
- PO 6** Work effectively as an individual as well as in the teams and in multi-disciplinary environment.
- PO 7** Communicate effectively in both verbal and written forms of communication.
- PO 8** Recognize the need for lifelong learning and will be engaged in it in the context of technological advancements.
- PO 9** Work effective as an individual as well in team in multi-disciplinary environment.

PO 10 Communicate effectively in written forms of communication

PO 11 Demonstrate knowledge of engineering and management principles and apply them to manage projects and finance.

PO 12 Recognize the need for lifelong learning and will be engaged in it in the context of technological advancement.




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COMPUTER SCIENCE & ENGINEERING DEPARTMENT

Programme Outcomes (PO)

After undergoing the learning process of four years, students of B.Tech. (Computer Science & Engineering) at Dr. Babasaheb Ambedkar Technological University will have an ability to build information systems and provide computer based solutions to real life problems. The graduates of this programme will demonstrate following abilities and skill sets.

Outcome

Outcomes

Identifier

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 possess the knowledge of advanced and emerging topics in the fields of operating systems, databases and computer networks.

PO8 The graduates will possess 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, and middle-ware and internet protocols in realizing distributed information environment.




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ELECTRICAL ENGINEERING DEPARTMENT

Program Outcomes (POs)

Engineering Graduate will be able to –

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **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.
3. **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.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **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.
6. **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.
7. **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.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **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.

11. **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.
12. **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.




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MECHANICAL ENGINEERING

Programme Outcomes (PO)

- PO 1** Apply the basic knowledge of mathematics, science and engineering to solve the mechanical engineering problems.
- PO 2** Assess societal, health, safety, cultural issues and responsibility related to mechanical engineering problem.
- PO 3** Demonstrate the ability to design and conduct experiments, interpret and analyze the data and report results
- PO 4** Select and use appropriate modern mechanical engineering tools to analyze and solve mechanical engineering problems.
- PO 5** Design solution for complex mechanical engineering problem that will satisfy the specific need.
- PO 6** Work effectively as an individual as well as in the teams and in multi-disciplinary environment.

PO 7 Communicate effectively in both verbal and written forms of communication.

PO 8 Recognize the need for lifelong learning and will be engaged in it in the context of technological advancements.

PO 9 Work effective as an individual as well in team in multi-disciplinary environment.

PO 10 Communicate effectively in written forms of communication

PO 11 Demonstrate knowledge of engineering and management principles and apply them to manage projects and finance.

PO 12 Recognize the need for lifelong learning and will be engaged in it in the context of technological advancement.



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MSPM'S

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Department of Computer Science and Engineering

COURSE OUTCOMES (A.Y. 2023-24)

ACADEMIC YEAR	CLASS	COURSE NAME	COURSE CODE	CO NO	Course Outcome
	SY	Engineering Mathematics-III	BTBS301	CO1	Solve higher order linear differential equation using appropriate techniques for modeling and analyzing electrical circuits
				CO2	Solve problems related to Fourier transform, Laplace transform and applications to Communication systems and Signal processing
				CO3	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
				CO4	Perform vector differentiation and integration, analyze the vector fields and apply to Electromagnetic fields
				CO5	Analyze conformal mappings, transformations and perform contour integration of complex functions in the study of electrostatics and signal processing.
	SY	Discrete Mathematics	BTCOC302	CO1	Understand sets, relations, functions and discrete structures. Apply Propositional logic and First order logic to solve problems.
				CO2	Express and solve number theoretic problems using algebraic properties of groups, rings and fields.
				CO3	To design and develop real time application using graph theory.
				CO4	Students would be able to model and analyze computational processes using analytic and combinatorial methods.
				CO5	Students will be able to use the methods learnt as part of this subject in subsequent courses in the design and analysis of algorithms, theory of computation, and compilers
				CO6	Develop a discrete model for a given computational problem and solve.
	SY	Computer Architecture and Organization	BTCOC304	CO1	Concept of computer organization and architecture, Fundamental unit, Computer function and interconnection,
				CO2	Assembly language, Addressing modes, instruction format, Types of instruction, Instruction execution, Machine state and processor status, Structure of program, Introduction to RISC and CISC architecture
				CO3	The arithmetic and logic Unit, Introduction of arithmetic co-processor.
				CO4	Internal Memory: Semiconductor main memory, Error correction, Advanced DRAM organization, Virtual memory systems and cache memory systems
				CO5	Control unit operation, Input/output Organization
	SY	Object Oriented in C++	BTCOC305A	CO1	Appreciation and understanding of object oriented concepts and their utility.
				CO2	Apply Object oriented approach to design software.
				CO3	Ability to formulate the problem, come up with object oriented design.
				CO4	Practicing use of different features of Object Oriented Methodology like templates, exception handling, reflection etc.
CO5				Study different systems and apply different design methodologies based on the problem specification and objectives.	
SY	Data Structures	BTCOC303	CO1	Understand basic data structures such as arrays, strings, and linked lists	
			CO2	Study linear data structures such as stacks and queues and understand their differences.	
			CO3	Describe the hash function and concepts of collision and its resolution methods.	
			CO4	Understand the concept of memory management.	
			CO5	Study tree, heap and graph along with their basic operations.	
			CO6	Study different techniques for solving problems like sorting and searching	


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2023-24(ODD SEM)

2023-24(ODD SEM)	TY	Database Systems	BTCOC501	CO1	Model, design and normalize databases for real life applications.
				CO2	To learn data models, conceptualize and depict database system using ER diagram.
				CO3	Understand validation framework like integrity constraints, triggers and assertions.
				CO4	To know the limitations of computation, i.e. the unsolvability of problems.
				CO5	Understand various storage structures and query optimization.
	TY	Theory of Computation	BTCOC502	CO1	Design finite state machines, regular expressions and grammars for given languages.
				CO2	Understand formal machines, languages and computations
				CO3	Develop analytical thinking and intuition for problem solving situations in related areas of theory of computation.
				CO4	To know the limitations of computation, i.e. the unsolvability of problems.
	TY	Software Engineering	BTCOC503	CO1	To understand the Software Engineering Practice & Process Models.
				CO2	To understand Design Engineering, Web applications, and Software Project Management.
				CO3	An understanding of some ethical and professional issues that are important for software engineers.
				CO4	To develop an ability to look at the Computer Science discipline from Software Engineering Systems perspective.
	TY	Human computer interaction	BTCOE504A	CO1	Demonstrate an understanding of guidelines, principles, and theories influencing human computer interaction
				CO2	Describe the key design principles for user interfaces.
				CO3	Carry out the steps of experimental design, usability and experimental testing, and evaluation of human computer interaction systems.
				CO4	Develop and implement a process to gather requirements for, engage in iterative design of, and evaluate the usability of a user interface.
	TY	Numerical Methods	BTCOE504B	CO1	Demonstrate understanding of common numerical methods and how they are used to obtain approximate solutions to otherwise intractable mathematical problems
				CO2	Apply numerical methods to obtain approximate solutions to mathematical problems.
				CO3	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.
CO4				Analyze and evaluate the accuracy of common numerical methods	
CO5				Implement numerical methods in Matlab.	
CO6				Write efficient, well-documented Matlab code and present numerical results in an informative way.	
TY	Business Communication	BTHM505B	CO1	Familiarize and use appropriate business vocabulary and etiquettes in verbal communication in the professional context	
			CO2	Understand organizational structures, pay structures and performance assessments	
			CO3	Apply language skills in drafting various business documents and other necessary communications in the business context	
			CO4	Understand and address cross cultural differences in the corporate environment	
			CO5	Participate in planned and extempore enactments of various business situations	

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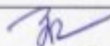


BTECH	Software Engineering	BTCOC701	CO1	How to apply the software engineering lifecycle by demonstrating competence in communication, planning, analysis, design, construction, and deployment
			CO2	An ability to work in one or more significant application domains
			CO3	Work as an individual and as part of a multidisciplinary team to develop and deliver quality software
			CO4	Demonstrate an understanding of and apply current theories, models, and techniques that provide a basis for the software lifecycle
BTECH	Distributed System	BTCOC702(B)	CO1	Demonstrate an ability to use the techniques and tools necessary for engineering practice
			CO2	Apply the fundamental concepts in datacenters to understand the tradeoffs in power, efficiency and cost.
			CO3	Identify resource management fundamentals, i.e. resource abstraction, sharing and sandboxing and outline their role in managing infrastructure in cloud computing.
			CO4	Analyze various cloud programming models and apply them to solve problems on the cloud.
BTECH	Big Data Analytics	BTCOE703C	CO1	Understand fundamentals of Big Data analytics .
			CO2	Understand Hadoop framework and Hadoop Distributed File system.
			CO3	Illustrate the concepts of NoSQL using MongoDB and Cassandra for BigData.
			CO4	Demonstrate the Map Reduce programming model to process the bigdata along with Hadoop tools.
			CO5	Apply machine Learning algorithms for real world big data, web contents and Social Networks to provide analytics with relevant visualization tools.
BTECH	Blockchain Technology	BTCOE704C	CO1	Understand the various technologies and its business use.
			CO2	Analyse the block chain applications in a structure manner.
			CO3	Explain the modern concepts of block chain technology systematically.
			CO4	Handle the cryptocurrency.
BTECH	Deep Learning	BTCOE705B	CO1	deep learning process. Gradient Descent, Feed forward Neural Networks.
			CO2	FeedForward Neural Networks, Backpropagation, Gradient Descent (GD)
			CO3	Auto encoders and relation to PCA, Regularization in auto encoders
			CO4	Convolutional Neural Networks, LeNet, AlexNet
			CO5	Back propagation through time, Encoder Decoder Models, Attention Mechanism, Attention over images.
BTECH	Design Thinking	BTCOE705C	CO1	Demonstrate the critical theories of design, systems thinking, and design methodologies
			CO2	Produce great designs, be a more effective engineer, and communicate with high emotional and intellectual impact
			CO3	Understand the diverse methods employed in design thinking and establish a workable design thinking framework to use in their practices
			CO4	Conceive, organize, lead and implement projects in interdisciplinary domain and address social concerns with innovative approaches


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ACADEMIC YEAR	CLASS	COURSE NAME	COURSE CODE	CO NO	Course Outcome
2023-24(EVEN SEM)	SY	Design and Analysis of Algorithm	BTCOC401	CO1	Analyzing the time and space complexity of given algorithms and data structure operations.
				CO2	Decide the appropriate design methodology for a given problem from among the paradigms of Divide and Conquer, Dynamic Programming, Greedy, Branch and Bound.
				CO3	Design algorithms for network flows.
				CO4	Distinguish between P and NP classes of problems.
				CO5	Students will be able to use the methods learnt as part of this subject in subsequent courses in the design and analysis of algorithms, theory of computation, and compilers.
	SY	Operating Systems	BTCOC402	CO1	Will be able to control access to a computer and the files that may be shared.
				CO2	Demonstrate the knowledge of the components of computer and their respective roles in computing.
				CO3	Ability to recognize and resolve user problems with standard operating environments.
				CO4	Gain practical knowledge of how programming languages, operating systems, and architectures interact and how to use each effectively.
	SY	Basic Human Rights	BTHM403	CO1	Understand the history of human rights.
				CO2	Learn to respect others caste, religion, region and culture.
				CO3	Be aware of their rights as Indian citizens.
				CO4	Understand the importance of groups and communities in the society.
				CO5	Realize the philosophical and cultural basis and historical perspectives of human rights.
				CO6	Make them aware of their responsibilities towards the nation.
	SY	Digital Logic Design & Microprocessors	BTES405	CO1	Identify casting processes, working principles and applications and list various defects in metal casting.
				CO2	Understand the various metal forming processes, working principles and applications.
				CO3	Classify the basic joining processes and demonstrate principles of welding, brazing and soldering.
				CO4	Study center lathe and its operations including plain, taper turning, work holding devices and cutting tool.
				CO5	Understand milling machines and operations, cutters and indexing for gear cutting.
				CO6	Study shaping, planing and drilling, their types and related tooling's.
	SY	Probability Theory and Random Processes	BTBS404	CO1	Understand the history of human rights.
				CO2	Learn to respect others caste, religion, region and culture.
				CO3	Be aware of their rights as Indian citizens.
CO4				Understand the importance of groups and communities in the society.	
CO5				Realize the philosophical and cultural basis and historical perspectives of human rights.	
CO6				Make them aware of their responsibilities towards the nation.	


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TY	Compiler Design	BTCOC601	CO1	To inform students about different parsing techniques, techniques to generate intermediate code and different optimization techniques.
			CO2	To enrich the knowledge in various phases of compiler and its use.
			CO3	To introduce the concepts underlying the design and implementation of language processors.
			CO4	To provide practical programming skills necessary for constructing a compiler.
TY	Employability and Skill Development	BTCOC605B	CO1	Have skills and preparedness for aptitude tests.
			CO2	Be equipped with essential communication skills (writing, verbal and non-verbal)
			CO3	Master the presentation skill and be ready for facing interviews.
			CO4	Build team and lead it for problem solving.
TY	Computer Networks	BTCOC602	CO1	Identify casting processes, working principles and applications and list various defects in metal casting.
			CO2	Understand the various metal forming processes, working principles and applications.
			CO3	Classify the basic joining processes and demonstrate principles of welding, brazing and soldering.
			CO4	Study center lathe and its operations including plain, taper turning, work holding devices and cutting tool.
			CO5	Understand milling machines and operations, cutters and indexing for gear cutting.
			CO6	Study shaping, planing and drilling, their types and related tooling's.
TY	Internet of Things	BTCOE604B	CO1	To learn the basic issues, policy and challenges in the Internet.
			CO2	To understand the cloud and Internet environment.
			CO3	To understand the cloud and Internet environment.
			CO4	To understand the various modes of communications with Internet.
TY	Machine Learning	BTCOC603	CO1	Learn the basics of learning problems with hypothesis and version spaces.
			CO2	Understand the features of machine learning to apply on real world problems.
			CO3	Characterize the machine learning algorithms as supervised learning and unsupervised learning and Apply and analyze the various algorithms of supervised and unsupervised learning.
			CO4	Analyze the concept of neural networks for learning linear and non-linear activation functions.
			CO5	Learn the concepts in Bayesian analysis from probability models and methods.
			CO6	Understand the fundamental concepts of Genetic Algorithm and Analyze and design the genetic algorithms for optimization engineering problems.



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MSPM'S
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Department of Mechanical Engineering

COURSE OUTCOMES (A.Y. 2023-24)

ACADEMIC YEAR	CLASS	COURSE NAME	COURSE CODE	CO NO	Course Outcome
	SY	Engineering Mathematics-III	BTBS301	CO1	Solve higher order linear differential equation using appropriate techniques for modeling and analyzing electrical circuits
				CO2	Solve problems related to Fourier transform, Laplace transform and applications to Communication systems and Signal processing
				CO3	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
				CO4	Perform vector differentiation and integration, analyze the vector fields and apply to Electromagnetic fields
				CO5	Analyze conformal mappings, transformations and perform contour integration of complex functions in the study of electronics and signal processing
	SY	MD CAD	BTMCL305	CO1	Interpret the object with the help of given sectional and orthographic views.
				CO2	Construct the curve of intersection of two solids
				CO3	Draw machine element such as shaft, knuckle, bolted and welded joint
				CO4	Assemble details of any given part, i.e. valve, pump, machine tool part etc.
				CO5	Represent tolerances and level of surface finish on production drawings
				CO6	Understand various creating and editing commands in Auto Cad
	SY	Materials Science and Metallurgy	BTMES304	CO1	Study various crystal structures of materials.
				CO2	Understand mechanical properties of materials and calculations of same using appropriate equations CO1 Evaluate phase diagram.
				CO3	Evaluate phase diagrams of various materials
				CO4	Suggest appropriate heat treatment process for a given application
				CO5	Prepare samples of different materials for metallography.
				CO6	Recommend appropriate NDT technique for a given application
	SY	Fluid Mechanics	BTMC302	CO1	Define fluid, define and calculate various properties of fluid
CO2				Calculate hydrostatic forces on the plane and curved surfaces and explain stability of floating body	
CO3				Explain various types of flow - Calculate acceleration of fluid particles.	
CO4				Apply Bernoulli's equation to simple problems in fluid mechanics.	
CO5				Explain laminar and turbulent flows on the flat plates and through pipes.	
CO6				Explain and use dimensional analysis to simple problems in fluid mechanics	
CO7				Understand centrifugal pump.	
SY	Thermodynamics	BTMC303	CO1	Define the terms like system, boundary, properties, equilibrium, work, heat, ideal gas, entropy etc. used in thermodynamics	
			CO2	Studied different laws of thermodynamics and apply these to simple thermal systems to study energy balance	
			CO3	Studied Entropy, application and disorder.	
			CO4	Studied various types of processes like isothermal, adiabatic, etc. considering system with ideal gas and represent them on p-v and T-s planes.	
			CO5	Represent phase diagram of pure substance (steam) on different thermodynamic planes like p-v, T-s, etc. Show various constant property lines on them.	
			CO6		


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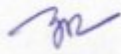


023-24(ODD SEM

TY	Automobile Engineering	BTAPE504D	CO1	Identify the different parts of the automobile.
			CO2	Explain the working of various parts like engine, transmission, clutch, brakes etc.
			CO3	Demonstrate various types of drive systems, front and rear wheels, two and four wheel drive
			CO4	Apply vehicle troubleshooting and maintenance procedures.
			CO5	Analyze the environmental implications of automobile emissions. And suggest suitable regulatory modifications.
TY	Theory of Machine II	BTMC503	CO1	Identify and select type of belt and rope drive for a particular application
			CO2	Evaluate gear tooth geometry and select appropriate gears , gear trains
			CO3	Define governor and select / suggest an appropriate governor
			CO4	Characterize flywheels as per engine requirement.
			CO5	Understand gyroscopic effects in ships , aeroplanes and road vehicles.
			CO6	Understand free and forced vibrations of single degree freedom system
TY	Machine Design – I	BTMC 502	CO1	Formulate the problem by identifying customer need and convert into design Specification.
			CO2	Understand component behavior subjected to loads and identify failure criteria.
			CO3	Analyze the stresses and strain induced in the component.
			CO4	Design of machine component using theories of failures.
			CO5	Design of component for finite life and infinite life when subjected to fluctuating load.
			CO6	Design of components like shaft, key, coupling, screw and spring.
TY	Heat Transfer	BTMC 501	CO1	Explain the laws of heat transfer and deduce the general heat conduction equation and to explain it for 1-D steady state heat transfer in regular shape bodies
			CO2	Describe the critical radius of insulation, overall heat transfer coefficient, thermal conductivity and lumped heat transfer
			CO3	Interpret the extended surfaces
			CO4	Illustrate the boundary layer concept, dimensional analysis, forced and free convection under different conditions
			CO5	Describe the Boiling heat transfer, Evaluate the heat exchanger and examine the LMTD and NTU methods applied to engineering problems
			CO6	Explain the thermal radiation black body, emissivity and reflectivity and evaluation of view factor and radiation shields
TY	Applied Thermodynamics	BTMC506	CO1	Define the terms like calorific value of fuel, stoichiometric air-fuel ratio, excess air, equivalent evaporation, boiler efficiency, etc. Calculate minimum air required for combustion of fuel.
			CO2	Studied and Analyze gas power cycles and vapour power cycles and derive expressions for the performance parameters like thermal efficiency.
			CO3	Classify various types of boiler, nozzle, steam turbine and condenser used in steam power plant.
			CO4	Classify various types of condenser, nozzle and derive equations for its efficiency.
			CO5	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.
TY	Solar Energy	BTMOE505A	CO1	Describe measurement of direct, diffuse and global solar radiations falling on horizontal and inclined surfaces.
			CO2	Analyze the performance of flat plate collector, air heater and concentrating type collector
			CO3	Understand test procedures and apply these while testing different types of collectors.
			CO4	Study and compare various types of thermal energy storage systems.
			CO5	Analyze payback period and annual solar savings due to replacement of conventional systems
			CO6	Design solar water heating system for a few domestic and commercial applications



BTECH	Entrepreneurship Development	BTMOE704B	CO1	Enlarge the supply of entrepreneurs for rapid industrial development
			CO2	Develop small and medium enterprises sector which is necessary for generation of employment
			CO3	Industrialize rural and backward regions
			CO4	Provide gainful self-employment to educated young men and women
			CO5	Diversify the sources of entrepreneurship
BTECH	Industrial Engineering and Management	BTMEC704B	CO1	Impart fundamental knowledge and skill sets required in the Industrial Management and Engineering profession, which include the ability to apply basic knowledge of mathematics, probability and statistics, and the domain knowledge of Industrial Management and Engineering.
			CO2	Produce ability to adopt a systems approach to design, develop, implement and innovate integrated systems that include people, materials, information, equipment and cost.
			CO3	Understand the interactions between engineering, business, technological and Environmental spheres in the modern society.
			CO4	Understand their role as engineers and their impact to society at the national and Global context.
BTECH	Mechatronics	BTMEC701	CO1	Define sensor, transducer and understand the applications of different sensors and transducers
			CO2	Explain the signal conditioning and data representation techniques
			CO3	Design pneumatic and hydraulic circuits for a given application
			CO4	Write a PLC program using Ladder logic for a given application
			CO5	Understand applications of microprocessor and micro controller
			CO6	Analyse PI, PD and PID controllers for a given application
BTECH	Intellectual Property Rights	BTMOI705C	CO1	State the basic fundamental terms such as copyrights, Patents, Trademarks etc.,
			CO2	Interpret Laws of copy-right, Patents, Trademarks and various IP registration Processes.
			CO3	Exhibit the inherent capability to do economic analysis of IP rights, technology and innovation related policy issues and firms commercial strategies.
			CO4	Create awareness at all levels (research and innovation) to develop patentable technologies
			CO5	Apply trade mark law, copy right law, patent law and also carry out intellectual property audits.
			CO6	Manage and safeguard the intellectual property and protect it against unauthorized use.


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ACADEMIC YEA	CLASS	COURSE NAME	COURSE CODE	CO NO	Course Outcome
23-24(EVEN SEM)	SY	Sheet Metal Engineering	BTMPE405B	CO1	Recognize common manufacturing processes of Sheet Metal Fabrication
				CO2	Understand the principles of design and fabrication of sheet metal products and recognize common material used in the industry
				CO3	Distinguish Shearing, Drawing and Pressing etc. processes
				CO4	Know types of dies and formability
				CO5	Select mechanical or hydraulic presses for the given process
	SY	Theory of machine I	BTMC402	CO1	Define basic terminology of Kinematics of Mechanism
				CO2	Classify planer mechanism and calculate degree of freedom
				CO3	Perform kinematic analysis of a given mechanism using ICR and IV method.
				CO4	Introduction of different types of lubricating systems
				CO5	Perform kinematic analysis of slider crank mechanism using Klein's construction and analytical approach.
				CO6	Perform balancing of unbalance forces in rotating masses and different types of single/multi cylinder reciprocating engines in different positions.
	SY	Basic Human Rights	BTHM403	CO1	Understand the history of human rights.
				CO2	Learn to respect others caste, religion, region and culture.
				CO3	Be aware of their rights as Indian citizen.
				CO4	Understand the importance of groups and communities in the society.
				CO5	Realize the philosophical and cultural basis and historical perspectives of human rights.
				CO6	Make them aware of their responsibilities towards the nation.
	SY	Manufacturing Processes-I	BTMC401	CO1	Identify casting processes, working principles and applications and list various defects in metal casting
				CO2	Understand the various metal forming processes, working principles and applications
				CO3	Classify the basic joining processes and demonstrate principles of welding, bearing and soldering.
CO4				Study center lathe and its operations including plan, taper turning, work holding devices and cutting tool	
CO5				Understand milling machines and operations, cutters and indexing for gear cutting	
CO6				Study shaping, planing and drilling, their types and related tooling's	
SY	Strength of Materials	BTMES404	CO1	State the basic definitions of fundamental terms such as axial load, eccentric load, stress, strain, E, μ , principle stresses, etc	
			CO2	Analyze the stresses and strain energy in different load cases	
			CO3	Design the columns based on deflection	
			CO4	Design a beam based on bending and shafts based on torsion	
			CO5	Analyze given beam for calculations of SF and BM	
			CO6	Calculate slope and deflection at a point on cantilever /simply supported beam using double integration, Macaulay's, Area-moment and superposition methods	
SY	Numerical Methods in Mechanical Engineering	BTMPE405A	CO1	Describe the concept of error	
			CO2	Illustrate the concept of various Numerical Techniques	
			CO3	Evaluate the given engineering problem using the suitable Numerical Technique	
			CO4	Develop the computer programming based on the Numerical Techniques	

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and Management Studies, Parbhani



TY	Quantitative Techniques in Project Management	BTMOE605A	CO1	Define and formulate research models to solve real life problems for allocating limited resources by linear programming.
			CO2	Apply transportation and assignment models to real life situations.
			CO3	Apply queuing theory for performance evaluation of engineering and management systems.
			CO4	Apply the mathematical tool for decision making regarding replacement of items in real life.
			CO5	Determine the EOQ, ROP and safety stock for different inventory models.
			CO6	Construct a project network and apply CPM and PERT method.
TY	Machine Design II	BTMEC602	CO1	Define function of bearing and classify bearings.
			CO2	Understanding failure of bearing and their influence on its selection.
			CO3	Classify the friction clutches and brakes and find the torque capacity and friction disk parameter.
			CO4	Select materials and configuration for machine element like gears, belts and chain.
			CO5	Design of elements like gears, belts and chain for given power rating.
			CO6	Design thickness of pressure vessel using thick shell theory.
TY	IC Engines	BTMEC604B	CO1	Understand various types of I.C. Engines and Cycles of operation.
			CO2	Analyze the effect of various operating variables on engine performance.
			CO3	Identify fuel metering and fuel supply systems for different types of engines.
			CO4	Understand normal and abnormal combustion phenomena in SI and CI engines.
			CO5	Evaluate performance Analysis of IC Engine and Justify the suitability of IC Engine for different application.
			CO6	Understand the conventional and non-conventional fuels for IC engines and effects of emission formation of IC engines, its effects and the legislation standards.
TY	Manufacturing Processes - II	BTMC 601	CO1	Understand the process of powder metallurgy and its applications.
			CO2	Calculate the cutting forces in orthogonal and oblique cutting.
			CO3	Evaluate the machinability of materials.
			CO4	Understand the abrasive processes.
			CO5	Explain the different precision machining processes.
			CO6	Understanding plastic.
TY	Product Life Cycle Management	BTMPE604B	CO1	Outline the concept of PLM.
			CO2	Illustrate the PDM system and its importance.
			CO3	Elaborate the product design process.
			CO4	Build the procedure for new product development.
			CO5	Classify and compare various technology forecasting methods.
			CO6	Outline the stages involved in PLM for a given product.


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COURSE OUTCOMES (A.Y. 2022-23)

ACADEMIC YEAR	CLASS	COURSE NAME	COURSE CODE	CO NO	Course Outcome
	SY	Engineering Mathematics-III	BTBS301	CO1	Solve higher order linear differential equation using appropriate techniques for modeling and analyzing electrical circuits
				CO2	Solve problems related to Fourier transform, Laplace transform and applications to Communication systems and Signal processing
				CO3	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
				CO4	Perform vector differentiation and integration, analyze the vector fields and apply to Electromagnetic fields
				CO5	Analyze conformal mappings, transformations and perform contour integration of complex functions in the study of electrostatics and signal processing.
	SY	SOFT SKILL DEVELOPEMENT (AU)	BTHM 306	CO1	Learners will acquire interpersonal communication skills.
				CO2	Learners will develop the ability to work independently.
				CO3	Learners will develop the qualities like self-discipline, self-criticism and self-management.
				CO4	Learners will have the qualities of time management and discipline.
				CO5	Learners would be able to present themselves as an inspiration for others.
	SY	Mechanics Of Solids	BTCVES302	CO1	Perform the stress-strain analysis.
				CO2	Draw force distribution diagrams for members and determinate beams .
				CO3	Visualize force deformation behavior of bodies.
				CO4	Understand the concept of long and short column.
				CO5	Perform failure analysis.
	SY	Building Construction & Drawing	BTCVC303	CO1	Understand types of masonry structures.
				CO2	Comprehend components of building there purposes.
				CO3	Draw plan elevation & section of various structures.
				CO4	Apply the principles of planning & byelaws used for building planning.
				CO5	Prepare detailed working drawing for doors & windows.
SY	Surveying	BTCVC305	CO1	Perform measurements in linear/angular methods. Use the theodolite along with chain/tape, compass on the field.	
			CO2	Perform plane table surveying in general terrain. Apply field procedures in basic types of surveys, as part of a surveying team	
			CO3	Know the basics of leveling and Theodolite survey in elevation and angular measurements.	
			CO4	Apply geometric and trigonometric principles of basic surveying calculations. Plan a survey, taking accurate measurements, field booking, and adjustment of errors.	
			CO5	Employ drawing techniques in the development of a topographic map.	
				CO1	Understand various steps in project Management, different types of charts.
				CO2	Construct a network by using CPM and PERT methods.



2022-23(ODD SEM)

2022-23(ODD SEM)	TY	PROJECT MANAGEMENT	BTHM505	CO3	Determine the optimum duration of the project with the help of various time estimates
				CO4	Know the concept of engineering economics, economic comparisons, and linear break even analysis problems
				CO5	Understand the concept of total quality Management including Juran and Deming's philosophy.
	TY	Elective (Town & Urban Planning)	BTCVPE506 F	CO1	To discuss town and Urban planning with essential attributes
				CO2	To provide information of various aspects involved town and Urban planning
				CO3	To make students familiar with various standards, acts, laws and guidelines
				CO4	To Understand the various Acts of Town & Urban Planning
				CO5	To Understand the various Development Approaches regarding Towns & Urban Planning
	TY	Geotechnical Engineering	BTCVC502	CO1	Understand Soil and Soil Structures.
				CO2	Understand different soil properties and behavior
				CO3	Understand stresses in soil and permeability and seepage aspects
				CO4	Develop ability to take up soil design of various foundations.
				CO5	Understand about compaction and consolidation properties of soil.
	TY	Design of Steel Structures	BTCVC501	CO1	Identify and compute the design loads and the stresses developed in the steel member and analyze and design the various connections and identify the potential failure modes.
				CO2	Able to Analyze and design various tension, compression and flexural members.
CO3				To know and design components of Gantry girder, roof trusses	
CO4				To analyze and design column and column bases	
CO5				To Aware about Plastic Analysis ,Limit State method and understand provisions in relevant BIS Code	
TY	Structural Mechanics-II	BTCVC503	CO1	Have a basic understanding of concept influence line and understanding the trusses.	
			CO2	Have a basic understanding of concept bridges and arches.	
			CO3	Have a basic understanding of flexibility matrix method of analysis and will be able to analyze the determinant structure.	
			CO4	Have a basic understanding of stiffness matrix method of analysis and will be able to analyze the determinant structure.	
			CO5	Have a basic understanding of the principles and concepts related to finite differences and finite element methods.	
TY	Concrete Technology	BTCVC504	CO1	Understand the various types and properties of ingredients of concrete.	
			CO2	Understand the various types and properties of Fresh Concrete	
			CO3	Understand effect of admixtures on the behavior of the fresh and hardened concrete	
			CO4	Understand the various properties of Hardened Concrete	
			CO5	Formulate concrete design mix for various grades of concrete.	
TY	Software Application in Civil Engineering	BTCVSS07	CO1	To know about software and it's working procedure	
			CO2	To use software in Structural Analysis , hydraulics	
			CO3	To apply knowledge of software in Foundation Engineering and Costing	



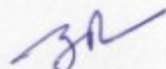
			CO4	Application of Software in Environmental, Transportation and Structural design
			CO5	Use applications of various softwares in specialized works of civil engineering.
BTECH	Design of Concrete Structures-II	BTCVC701	CO1	Able to identify the behavior, analyze and design of the beam sections subjected to torsion.
			CO2	Able to analyze and design axially and eccentrically loaded columns and construct the interaction diagram for them.
			CO3	Understand various concepts, systems.
			CO4	To calculate losses in prestressing.
			CO5	Able to analyze and design the rectangular and symmetrical I-section prestressed beam/girders
			CO6	Able to Design end blocks and Codal Provisions. Also know necessity, implementation of audit, format of reporting, consequences
BTECH	INFRASTRUCTURE ENGINEERING	BTCVC702	CO1	Know about the basics and design of various components of railway engineering
			CO2	Understand the types and functions of tracks, junctions and railway stations
			CO3	Understand components of bridges and its various types, site selection criteria and comprehend various forces acting on bridges.
			CO4	Able to understand Tunnel, methods and drainage in tunnels.
			CO5	Understand the types and components of docks and harbors. Know about the aircraft characteristics, planning and components of airport
BTECH	Water Resource Engineering	BTCVC703	CO1	Understand the need of Irrigation in India and water requirement as per farming practice in India.
			CO2	Understand various irrigation structures and schemes.
			CO3	Develop a basis for design of irrigation schemes.
			CO4	Understand the design of hydraulic structures.
			CO5	Understand various phases and methods of hydrology.
BTECH	Professional Practices	BTCVC704	CO1	Understand the importance of preparing the types of estimates under different conditions for various structures.
			CO2	Understand the detailed specifications.
			CO3	Know about the rate analysis and bill preparations and to study about the specification writing.
			CO4	Know the various types of tendering.
			CO5	Know the various types of contract.
			CO6	Understand the valuation of land and buildings, various methods and factors affecting valuation.
BTECH	Construction Techniques	BTCVE705A	CO1	Understand the planning of new project with site accessibility and services required.
			CO2	Comprehend the various civil construction equipment's
			CO3	Familiar with layout of RMC plant, production, capacity and operation process.
			CO4	Recognize various aspect of road construction, railway track construction etc.
			CO5	Familiar with construction of diaphragm walls.



ACADEMIC YEAR	CLASS	COURSE NAME	COURSE CODE	CO NO	Course Outcome
2022-23(EVEN SEM)	SY	BUILDING PLANNING & DESIGN	BTCVC401	CO1	To plan buildings considering various principles of planning and bye law of governing body
				CO2	Comprehend various utility requirements in buildings
				CO3	Understand various techniques in plumbing, electrification, fire resistance for a building.
				CO4	Understand various techniques of Air conditioning & Thermal Insulation for a building
				CO5	Understand various techniques for good acoustics.
	SY	ENGINEERING GEOLOGY	BTCVC406	CO1	To understand Physical Geology
				CO2	Identify the origin, texture and structure of various rocks and physical properties of mineral.
				CO3	Recognize the different land forms which are formed by various geological agents.
				CO4	Emphasize distinct geological structures which have influence on the civil engineering structure.
				CO5	Understand how the various geological conditions affect the design parameters of structures.
	SY	Environmental Engineering	BTCVC402	CO1	Apply the water treatment concept and methods.
				CO2	Prepare basic process designs of water and wastewater treatment plants.
				CO3	Apply the wastewater treatment concept and methods.
				CO4	Apply the solid waste management concepts.
				CO5	Prepare basic process designs of Biological treatment.
	SY	Water Resource Engineering	BTCVC404	CO1	Understand the need of Irrigation in India and water requirement as per farming practice in India.
				CO2	Understand various irrigation structures and schemes.
				CO3	Develop a basis for design of irrigation schemes.
				CO4	Understand the design of hydraulic structures.
				CO5	Understand various phases and methods of hydrology.
	SY	Structural Mechanics-I	BTCVC403	CO1	Describe the concept of structural analysis, degree of indeterminacy.
				CO2	Identify determinate and indeterminate trusses and calculate forces in the members of trusses
				CO3	Analyze the Indeterminate Beams,Fixed Beams
				CO4	Perform the distribution of the moments the in continuous beam and frame
				CO5	Calculate slopes and deflection at various locations for different types of beam
SY	Hydraulics-II	BTCVC405	CO1	Design open channel sections in a most economical way.	
			CO2	Know about the non-uniform flows in open channel and the characteristics of hydraulic jump.	
			CO3	Understand application of momentum principle of impact of jets on plane.	
			CO4	Understand the importance of turbines.	
			CO5	Understand the classifications of pumps.	



TY	Foundation Engineering	BTCVC602	CO1	To predict soil behavior under the application of loads and come up with appropriate solutions to foundation design queries.
			CO2	Deep Analysis of Bearing Capacity.
			CO3	Analyze the results of in-situ tests and transform measurements and associated uncertainties into relevant design parameters.
			CO4	Synthesize the concepts of allowable stress design, appropriate factors of safety, margin of safety, and reliability.
			CO5	Understanding of Deep Foundation and its types, Analyze the stability of slope by theoretical and graphical methods.
TY	Transportation Engineering	BTCVC603	CO1	Comprehend various types of transportation systems and their history of the development Comprehend to various types of pavements
			CO2	Analyze geometric design such sight distance, Horizontal Alignment, Vertical Alignment
			CO3	Comprehend different properties of Highway materials
			CO4	Analyze different characteristics of Traffic & Operations,
			CO5	Design the pavements by considering various aspects associated with traffic safety measures.
TY	DESIGN OF RC STRUCTURES	BTCVC601	CO1	Able to comprehend the various design philosophies used in design of reinforced concrete.
			CO2	Analyze and design the reinforced concrete sections using working stress method
			CO3	Understand Basic concept of Limit state method and Know design of members for shear and bond
			CO4	Analyze and design the reinforced concrete sections for Limit state of Flexure
			CO5	Analyze and design the reinforced concrete sections for Limit state of Collapse
TY	Industrial Waste Treatment	BTCVPE604 A	CO1	Identify & analyze the characteristics of industrial wastewater.
			CO2	Describe pollution effects of disposal of industrial effluent.
			CO3	Identify & design treatment option for industrial handling industrial liquid waste.
			CO4	Formulate environmental management plan.
TY	INDIAN CONSTITUTION	BTHM606	CO1	Know the importance of constitution & government.
			CO2	Become good citizens & know their fundamental rights, duties & principles.
			CO3	Learn about the role of PM, President, CM & local administration.
			CO4	Understand the importance of the election commission.
			CO5	Will know about Secularism, Federalism, Democracy, Liberty, Freedom of Expression, Special status of states etc


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MUNS

Shri Shree Institute of Engineering & Management Studies, Porbandar

Department of Electrical & Electronics Engineering

COURSE OUTCOMES (A.S. 2023-24)

ACADEMIC YEAR	CLASS	COURSE NAME	COURSE CODE	CO NO	Course Outcome
	SY	Engineering Mathematics-III	BTESJ01	CO1	Solve higher order linear differential equation using appropriate techniques for modeling and analyzing electrical circuits
				CO2	Solve problems related to Fourier transforms, Laplace transforms and applications to Communication systems and signal processing
				CO3	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
				CO4	Perform vector differentiation and integration, analyze the vector fields and apply to Electromagnetic fields
				CO5	Analyze nodal mapping, transformations and perform contour integration of complex functions in the study of electronics and signal processing.
	SY	CENTRAL & ELECTRONICS MEASUREMENTS	BTTEC303	CO1	Understand the properties of transducers in electrical and electronics engineering applications
				CO2	Identify and describe common electrical and electronic measurement instruments, such as voltmeters, ammeters, Wattmeter, Energy meter
				CO3	Explain the fundamental principles of AC & DC bridge circuits, including balanced and unbalanced conditions
				CO4	Use cathode-ray, signal generator, oscilloscope and TDR for the measurement and analysis of electrical & electronic waveforms
				CO5	Understand the working principles of sensors and transducers & principles of data acquisition systems analyze different types of sensors
	SY	Electrical Machines I	BTTEC301	CO1	To know the concept of 1 phase transformer and other transformers
				CO2	To know the concept of 3 phase transformer and other transformers
				CO3	To know the energy conversion systems
				CO4	To know the conceptual details of DC Generator
				CO5	To know the conceptual details of DC Motor
				CO6	To know the construction of Special Machines
	SY	Engineering Material Science	BTES305	CO1	Understand the conducting behavior of materials
				CO2	Understand the dielectric behavior of materials
				CO3	Synthesis and processing of semi-conducting materials for engineering applications
				CO4	Relate/compare between diamagnetic, paramagnetic, ferromagnetic, ferroelectric, and antiferromagnetic behavior of materials
				CO5	Understand Special Purpose Methods
				CO6	To know the architecture of 8085 microprocessor. Apply knowledge and demonstrate programming proficiency using the various addressing modes
	TY	Microprocessor & Microcontroller	BTTECS02	CO1	To understand interfacing of 8085 Microprocessor with Memory and I/O
				CO2	To understand interfacing of 8085 Microprocessor with ADC, DAC and other peripheral devices. To develop program for basic applications
				CO3	To know the architecture of 8051 microcontroller. To understand 8051 Peripheral Functions. Apply knowledge and demonstrate programming proficiency
				CO4	To understand interfacing of 8051 Microcontroller with ADC, DAC and other peripheral devices.
				CO5	
				CO6	



ACADEMIC YEAR	CLASS	COURSE NAME	COURSE CODE	CD NO	Course Outcome
2023-24(EVEN SEM)	IY	Analog and Digital Electronics	BTEEM4	CO1	Know the characteristics of Transistor. Understand the utilization of components. Design and analyze small signal amplifier circuits.
				CO2	Understand the operational Amplifier, working principles and applications.
				CO3	Learn Basic Logic Gates & Postulates of Boolean algebra. Learn Basics of Number system.
				CO4	Study Digital Logic Gate Characteristics and know about the logic families and realization of logic gates also design and analyze sequential circuits.
				CO5	Understand Minimization Techniques for Simplifying Logic Functions.
				CO6	Design and analyze combinational Logic circuits.
	IY	Electronic Devices & Circuit	BTEEP545(D)	CO1	To study bipolar junction transistor in detail with its different configurations.
				CO2	The ability to analyze simple CE & MCOT with its different types.
				CO3	To study the installation of power amplifiers with its performance parameters & classification.
				CO4	To understand the concept of all feedback amplifiers.
				CO5	To study unregulated & non-inverting regulator & regulated power supply with its types.
	IY	Network Theory	BTEEC491	CO1	Developing strong basis for network theory.
				CO2	Develop the problem solving technique for network by application of different network theorems.
				CO3	Understand the behavior of network by analyzing its transient response using Classical method.
				CO4	Understand the behavior of network by analyzing its transient response using Laplace transform.
				CO5	Analyze the two port network parameters and network functions.
	CO 6	Apply knowledge of network theory for designing special circuits like filters.			
	IY	Electrical Machine Design	BTEEL492	CO1	To understand principles of electric machine design.
				CO2	To design different components of electric machine.
				CO3	Design stator core & rotor windings of an induction motor, design rotor core & rotor winding of an induction motor.
CO4				To understand heating, Cooling and Ventilation.	
CO5				To design Transformer.	
CO6				To understand CAD and use it for transformer design and windings of electrical machines.	
IY	Control System Engineering	BTEEC493	CO1	To study classification of control system & represent in various model.	
			CO2	To apply standard test signals to a system & determine their characteristics.	
			CO3	To make use of stability concepts & obtain desired characteristics.	
			CO4	To determine the characteristics of a linear control system using various time & frequency domain tools.	
			CO5	To analyze the system behavior using various stability analysis techniques.	



MIPMT
Parbhani Institute of Engineering & Management Studies, Parbhani
Department of Electrical & Electronics Engineering
COURSE OUTCOMES(A.S.2023-24)

SEMESTER	SY	COURSE	CODE	OUTCOME	
622-23(ODD SEM)	SY	Engineering Mathematics-III	BTBS301	CO1	Solve higher order linear differential equation using appropriate techniques for modeling and analyzing electrical circuits
				CO2	Solve problems related to Fourier transform, Laplace transform and applications to Communication system and Signal processing
				CO3	Obtain interpolating polynomials, numerically differentiate and integrate functions, numerical solution of differential equation using single step and multi-step methods and in modern scientific computing
				CO4	Perform vector differentiation and integration, analyze the vector fields and apply to Electrostatic fields
				CO5	Analyze conformal mappings, transformations and perform contour integration of complex functions in the study of electronics and signal processing.
	SY	Electrical & Electronics Measurement	BTEEC303	CO1	To Understand the characteristics of instruments and Measurement System. Develop the knowledge of theoretical and mathematical principles of electrical measuring instruments
				CO2	Learn different types of analog quantity Measuring Instruments and identify various types of electronic instrument suitable.
				CO3	Study to design AC and DC bridges for relevant parameter measurement
				CO4	Learn different types of digital Measuring Instruments and identify various types of electronic instrument
				CO5	Describe the working principle, selection criteria and applications of various transducers used in measurement systems
	SY	Electrical Machines I	BTEEC302	CO1	To know the concept of 1 phase transformer and other transformers.
				CO2	To know the concept of 3 phase transformer and other transformers.
				CO3	To know the energy conversion systems.
				CO4	To know the conceptual details of DC Generator.
				CO5	To know the conceptual details of DC Motor.
	SY	Engineering Material Science	BTECS305	CO1	Understand the conducting behavior of materials
				CO2	Understand the dielectric behavior of materials
				CO3	Synthesis and processing of semi-conducting materials for engineering applications
				CO4	Differentiate between diamagnetic, paramagnetic, ferromagnetic, ferroelectric, and antiferromagnetic behavior of materials
				CO5	Understand Special Purpose Materials
	TY	Microprocessor & Microcontroller	BTEEC302	CO1	To know the architecture of 8051 microprocessor. Apply knowledge and demonstrate programming proficiency
				CO2	To understand interfacing of 8085 Microprocessor with memory and PPI
				CO3	To understand interfacing of 8085 Microprocessor with ADC, DAC and other peripheral devices. To develop program for basic applications
				CO4	To know the architecture of 8051 Microcontroller. To understand 8051 Peripheral Functions. Apply knowledge and demonstrate
CO5				To understand interfacing of 8051 Microcontroller with ADC, DAC and other peripheral devices.	
TY	Electrical Safety	BTEEOE040	CO1	Explain the objectives and precautions of Electrical Safety; effects of Shocks and their Prevention.	
			CO2	Summarize the Safety aspects during Installation of Plant and Equipment.	
			CO3	Describe the electrical safety in residential, commercial and agricultural installations.	
			CO4	Describe the various Electrical Safety in Hazardous Areas, Equipment Earthing and System Neutral Earthing.	
TY	Smart Grid Technology	BTEEP040	CO1	State the electrical systems safety management and IE rules.	
			CO2	Understanding of Smart Grid Concepts	
			CO3	Identify and describe Smart Grid Architecture	
			CO4	Understand the role of Distribution Generation Technologies in smart grid	
				CO5	Learn about Communication Technologies and Smart Grid
				CO6	Understand the use of monitoring and control systems in Smart Grids



TY	Industrial Automation	BTEEP604	CO1	To study the Industrial Automation concepts with its components.
			CO2	To study the basis of programmable logic controller with its applications.
			CO3	To study the Industrial drives with its classification and application.
			CO4	To understand the SCADA architecture with its operation and different applications.
TY	Power Electronics	BTEEC903	CO1	To study the distributed control systems with its merits and demerits.
			CO1	Understand principle, operation & characteristics of basic semiconductor devices.
			CO2	Learn turn on & turn off circuits of power semiconductor devices.
			CO3	To understand & analyze performance of controlled and uncontrolled converters.
			CO4	To understand & analyze performance of AC voltage controllers.
			CO6	Understand & analyze performance of DC to DC converters.
TY	POWER SYSTEM ANALYSIS	BTEEC901	CO1	Analyse the mathematical representation of power system components and solution techniques.
			CO2	Generalise the load flow analysis using various methods.
			CO3	Produce the optimal load flow solutions by using iterative methods of load flow such as Gauss-Seidel, Newton-Raphson method.
			CO4	Infer knowledge of the different types of faults and its calculation using computer method and mathematical model.
			CO5	Know the concept of numerical integration methods to analyze power system transient stability.
			CO6	Analyse Security & Contingency, preventive and emergency control.
B.Tech	Special Purpose Electrical Machines	BTEEE704A	CO1	Demonstrate construction, working principle, and application of Synchronous Reluctance Motors
			CO2	Demonstrate construction, working principle, and application of Stepping Motors
			CO3	Demonstrate construction, working principle, and application of Switched Reluctance Motors
			CO4	Demonstrate construction, working principle, and application of Permanent Magnet Brushless D.C. Motors
			CO5	Demonstrate construction, working principle, and application of Permanent Magnet Synchronous Motors
			CO6	Demonstrate behaviour of induction generator and induction machine
B.Tech	Power System Operation and Control	BTEEE701	CO1	Explain the fundamental concept of power system.
			CO2	Design the mathematical model of synchronous machine.
			CO3	Design the mathematical model Excitation system and speed governing system.
			CO4	Analyze the transient stability of power system using swing equation and equal area criteria.
			CO5	Analyze the economic operation of power system.
			CO6	Explain the methods of Voltage control.
B.Tech	Introduction to Industry 4.0 and Industrial Automation	BTEEP803	CO1	Explain Industry 4.0 concerns the transformation of industrial processes
			CO2	Understand sensors, communication, and computational processing.
			CO3	Understand Cyber Physical Systems (CPS), Internet of Things (IoT), Cloud computing
			CO4	Industrial Internet of Things (IIoT) is an application of IoT in industries
			CO5	Application of IIoT into the automation system with enterprise
B. Tech	High Voltage Engineering	BTEEC701	CO1	To make students able to explain the various breakdown processes in solid, liquid and gaseous materials and describe Lightning
			CO2	To provide sound knowledge of Testing, Generation & measurement methods of DC, AC and impulse voltages and current.
			CO3	To develop ability to carry out various testing procedures as per ISI in laboratory with knowledge of earthing, safety and shielding of HV.
			CO4	Students able to know the lightning effects.
			CO5	Students able to know the Generation & Measurement of high voltages & currents
B. Tech	ENERGY AUDIT AND CONSERVATION	BTEEE705	CO1	Understand the concept of energy conservation and audit.
			CO2	Apply the knowledge of energy scenarios.
			CO3	Apply the concepts of energy efficiency in electrical and industrial systems.
			CO4	Examine the different energy efficient technologies in electrical system.
			CO5	Show the ability to apply the various energy conservation and audit concepts and submit a report.
B. Tech	Electrical Drives	BTEEC701	CO1	Understand dynamics of electrical drives system.
			CO2	Learn various modes of operation and control of electrical drives.
			CO3	To understand basic characteristics of DC motor drives.
			CO4	To understand & analyze performance of AC voltage controllers.
			CO5	Understand & analyze performance of synchronous motor drives.
			CO6	To select proficiently and the proper drive system for particular application.



ACADEMIC YEA	CLASS	COURSE NAME	COURSE CODE	CO NO	Course Outcomes
2023-24(EVEN SEM)	IY	Analog and Digital Electronics	BTEH404	CO1	Know the characteristics of Transistor.Understand the utilization of components. Design and analyze small signal amplifier circuits
				CO2	Understand the operational Amplifier, working principles and applications
				CO3	Learn Basic logic Gates & Positives of Boolean algebra. Learn Basics of Number system
				CO4	Study Digital Logic Gate Characteristics and know about the logic families and realization of logic gates also design
				CO5	Understand Minimization Techniques for Simplifying Logic Function
				CO6	Design and analyze combinational Logic circuits
	IY	Control System Engineering	BTEEC403	CO1	To study classification of control systems & represent in various models.
				CO2	To apply standard test signals to a system & determine their characteristics.
				CO3	To make use of stability concepts & obtain desired characteristics.
				CO4	To determine the characteristics of a linear control system using various time & frequency domain tools.
	IY	Electronic Devices & Circuit	BTEEPE405(D)	CO1	To study bipolar junction transistor in detail with its different configurations.
				CO2	The ability to analyze simple BJT & MOSFET with its different types.
				CO3	To study the introduction of power amplifiers with its performance parameters & classification.
				CO4	To understand the concept of all feedback amplifiers.
				CO5	To study diode & zener diode & rectifier & regulated power supply with its types.
				CO6	To study diode & zener diode & rectifier & regulated power supply with its types.
	IY	Network Theory	BTEEC401	CO1	Developing strong basis for network theory.
				CO2	Develop the problem solving technique for network by application of different Network theorems
				CO3	Understand the behavior of network by analyzing its transient response using Classical method
				CO4	Understand the behavior of network by analyzing its transient response using Laplace transform
				CO5	Analyze the two port network parameters and network functions.
				CO6	Apply knowledge of network theory for designing special circuits like filters
	IY	Power System	BTEEC402	CO1	Explain various aspects of design considerations of different type of power plant and electrical equipment.
				CO2	Analyze types of transmission line parameter to design transmission line and understand the various losses during transmission.
				CO3	Understand mechanical design of transmission line and sag with their derivations and numericals.
				CO4	Understand types of transmission line and its important terms and analyze long transmission line and its numericals.
				CO5	Describe Ac and Dc distribution system and calculations for different loads.
				CO6	Describe Ac and Dc distribution system and calculations for different loads.
	IY	SwitchGear & Protection	BTEEC404	CO1	To elaborate construction and working principle of different types of HVCBs
				CO2	To describe the need of protective Relaying and operating principles of different types of relays.
				CO3	Study different type of faults in transformer, alternator and various protective schemes related to them.
				CO4	Learn transmission line protection schemes, and characteristics of different types of distance relays
	IY	Electrical Machine-II	BTEEC403	CO1	Understand the basic concepts in AC machines.
				CO2	Understand the the constructional features of armature windings.
				CO3	Examine the performance behavior of synchronous machines.
				CO4	Solve the performance parameters of Three phase Asynchronous machines.
				CO5	Examine the performance behavior of fractional kilowatt motors.
				CO6	Understand the types of special machines.
	IY	Electrical Machine Design	BTEEL402	CO1	To understand principles of electric machine design.
				CO2	To design different components of electric machine.
				CO3	Design Stator core & rotor winding of an induction motor, design rotor core & rotor winding of an induction motor.
				CO4	To understand Heating, Cooling and Ventilation
CO5				To design Transformer.	
CO6				To understand CAD and use it for transformer design and windings of electrical machines.	
IY	Power Plant Engineering	BTEEO505 B	CO1	To get basic knowledge of Different types of Power Plants, site selection criteria of each one of them.	
			CO2	Understanding of Thermal Power Plant and Hydro power plant Operation, online governing, different types of equipment used.	
			CO3	Basic knowledge and working of Nuclear power plant and diesel power plant.	
			CO4	To understand types and working of renewable power generation plants.	
			CO5	Understanding of Power Plant Economics, Interconnected system.	



MSPM'S
 Shri Shivaji Institute of Engineering & Management Studies, Parbhani
 Department of First Year Engineering
 COURSE OUTCOMES (A.Y. 2023-24)

ACADEMIC YEAR	CLASS	COURSE NAME	COURSE CODE	CO NO	Course Outcome
FY	Engineering Mathematics-I	BTBS101	CO1	Apply the matrix technique (Linear algebra) to find solutions of system of linear equations arising in many engineering problem	
			CO2	Demonstrate the concept partial derivatives and their applications to Maxima/ Minima, series expansion of multi valued functions.	
			CO3	Compute Jacobian of functions of several variables and their applications to engineering problems	
			CO4	Identify and sketch of curves in various coordinate system.	
			CO5	Evaluate multiple integrals and their applications to area and volume.	
FY	Engineering Physics	BTBS102P	CO1	Explain & apply the concept of types of Oscillation, Dielectric properties & ultrasonics	
			CO2	Explain & compare between Interference & Polarisation of light, working Principle of Lasers & Fiber optics	
			CO3	Interprete, apply & demonstrate principle of motion of charged particles in EF&MF, BA in bridge Mass spectrograph & G M counter	
			CO4	Identify Types of crystals & crystal planes using Miller indices, Experimental approach.	
FY	Engineering Graphics	BTES103G	CO1	Use of drawing instruments effectively for drawing and dimensioning.	
			CO2	Explain conventions and methods of engineering drawing.	
			CO3	Apply concept of projections of points, lines, planes, solids and section of solids.	
			CO4	Construct isometric and orthographic views of given objects.	
FY	Communication Skills	BTHM104	CO1	Apply speaking and writing skills in professional as well as social situations	
			CO2	Overcome Mother Tongue Influence and demonstrate neutral accent while exercising English	
			CO3	Apply communication skills for Presentations, Group Discussion and interpersonal interactions.	
			CO4	Apply grammar correctly during Speaking and Writing situations especially in context with Presentations, Public Speaking, Report writing and Business Correspondence	



MSPM'S
Shri Shivaji Institute of Engineering & Management Studies, Parbhani
Department of First Year Engineering
COURSE OUTCOMES (A.Y. 2023-24)

ACADEMIC YEAR	CLASS	COURSE NAME	COURSE CODE	CO NO.	Course Outcome
2023-24 (ODD SEM)	FY	Engineering Mathematics-I	BTBS101	CO1	Apply the matrix technique (Linear algebra) to find solutions of system of linear equations arising in many engineering problem
				CO2	Demonstrate the concept partial derivatives and their applications to Maxima/ Minima , series expansion of multi valued functions.
				CO3	Compute Jacobian of functions of several variables and their applications to engineering problems
				CO4	Identify and sketch of curves in various coordinate system.
				CO5	Evaluate multiple integrals and their applications to area and volume.
	FY	Engineering Physics	BTBS102P	CO1	Explain & apply the concept of types of Oscillation, Dielectric properties & ultrasonics
				CO2	Explain & compare between Interference & Polarisation of light, working Principle of Lasers & Fiber optics
				CO3	Interprete, apply & demonstrate principle of motion of charged particles in EF&MF, BA in bridge Mass spectrograph & G M counter
				CO4	Identify Types of crystals & crystal planes using Miller indices. Experimental approach.
	FY	Engineering Graphics	BTES103G	CO1	Use of drawing instruments effectively for drawing and dimensioning.
				CO2	Explain conventions and methods of engineering drawing.
				CO3	Apply concept of projections of points, lines, planes, solids and section of solids.
				CO4	Construct isometric and orthographic views of given objects.
	FY	Communication Skills	BTHM104	CO1	Apply speaking and writing skills in professional as well as social situations
				CO2	Overcome Mother Tongue Influence and demonstrate neutral accent while exercising English
				CO3	Apply communication skills for Presentations, Group Discussion and interpersonal interactions.
				CO4	Apply grammar correctly during Speaking and Writing situations especially in context with Presentations, Public Speaking, Report writing and Business Correspondence
	FY	Energy and Environment Engineering	BTES105	CO1	Identify conventional ,non conventional energy sources.
				CO2	Know and discuss power consuming and power developing devices for effective utilization and power consumption
				CO3	Identify various sources of air, water pollution and its effects.
CO4				Know and discuss noise, soil, thermal pollution and Identify solid, biomedical and hazardous waste.	



ACADEMIC YEAR	CLASS	COURSE NAME	COURSE CODE	CO NO.	Course Outcome
2023-24 (ODD SEM)	FY	Basic Civil and Mechanical Engineering	BTES106CM	CO1	Identify various Civil Engineering materials and choose suitable material among various options.
				CO2	Apply principles of surveying to solve engineering problem
				CO3	Identify various Civil Engineering structural components and select appropriate structural system among various options
				CO4	Explain and define various properties of basic thermodynamics, materials and manufacturing processes.
				CO5	Know and discuss the working principle of various power consuming and power developing devices
	FY	Engineering Graphics Lab	BTES108GL	CO1	Apply technical drawing standards and conventions in engineering graphics.
				CO2	Utilize geometric construction techniques for precise engineering drawings.
				CO3	Interpret and produce orthographic and isometric projections of various engineering objects.
				CO4	Enhance spatial reasoning and visualization skills through the projection of points, lines, planes, and solids.
				CO5	Integrate all learned skills to solve complex graphical problems and communicate technical information effectively through drawings.
	FY	Engineering Chemistry	BTBS102	CO1	Demonstrate knowledge of chemistry in technical fields.
				CO2	Bring adaptability to new developments in Engineering Chemistry and to acquire the skills required to become a perfect engineer.
				CO3	Develop the importance of water in industrial and domestic usage.
				CO4	Identify the concepts of Chemistry to lay the ground work for subsequent studies in various engineering fields.
				CO5	Examine a fuel and suggest alternative fuels.
	FY	Engineering Chemistry Lab	BTBS107L	CO1	To understand determination of hardness of water by edta or complexometric method.
				CO2	To analyse chlorine content of waste sample by precipitatin titration method.
				CO3	To determine Dissolved oxygen in water sample by Winklers Iodometric method.
				CO4	To understand concept of surface tension by number drop method.
				CO5	To determine viscosity of given liquid by ostwald viscometer.
FY	Engineering Mechanics	BTES103	CO1	Apply fundamental Laws of Engineering Mechanics	
			CO2	Apply Conditions of static equilibrium to analyze given force system	
			CO3	Compute Centre of gravity and Moment of Inertia of plane surfaces	
			CO4	Compute the motion characteristics of a body/particle for a Rectilinear and Curvilinear Motion	
			CO5	Know and discuss relation between force and motion characteristics.	



ACADEMIC YEAR	CLASS	COURSE NAME	COURSE CODE	CO NO.	Course Outcome
023-24 (ODD SEM)	FY	Computer Programming in C	BTES104	CO1	Gain a broad perspective about the uses of computers in engineering industry and C Programming.
				CO2	Develop the basic concept of algorithm, algorithmic thinking and flowchart.
				CO3	Apply the use of C programming language to implement various algorithms and develops the basic concepts and terminology of programming in general.
				CO4	Use the more advanced features of the C language.
				CO5	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.
	FY	Workshop Practices	BTES105L	CO1	Fabricate components with their own hands.
				CO2	Get practical knowledge of the dimensional accuracies tolerances applicable for different manufacturing processes.
				CO3	Produce small devices of their interest for project or research purposes.
	FY	Basic Electrical and Electronics Engg.	BTES106	CO1	Apply basic ideas and principles of electrical engineering.
				CO2	Identify protection equipment and energy storage devices
				CO3	Differentiate electrical and electronics domains and explain the operation of diodes and transistors.
				CO4	Acquire knowledge of digital electronics
				CO5	Design simple combinational and sequential logic circuits.

ACADEMIC YEAR	CLASS	COURSE NAME	COURSE CODE	CO NO	Course Outcome
2023-24 (EVEN SEM)	FY	Engineering Mathematics-II	BTBS201	CO1	Apply the matrix technique (Linear algebra) to find solutions of system of linear equations arising in many engineering problem
				CO2	Demonstrate the concept partial derivatives and their applications to Maxima/ Minima , series expansion of multi valued functions.
				CO3	Compute Jacobian of functions of several variables and their applications to engineering problems
				CO4	Identify and sketch of curves in various coordinate system.
				CO5	Evaluate multiple integrals and their applications to area and volume.
	FY	Engineering Physics	BTBS202P	CO1	Explain & apply the concept of types of Oscillation, Dielectric properties & ultrasonics
				CO2	Explain & compare between Interference & Polarisation of light, working Principle of Lasers & Fiber optics
				CO3	Interprete, apply & demonstrate principle of motion of charged particles in EF&MF, BA in bridge Mass spectrograph & G M counter
			CO4	Identify Types of crystals & crystal planes using Miller indices, Experimental approach.	



ACADEMIC YEAR	CLASS	COURSE NAME	COURSE CODE	CO NO	Course Outcome
2023-24 (EVEN SEM)	FY	Engineering Graphics	BTES203G	CO1	Use of drawing instruments effectively for drawing and dimensioning.
				CO2	Explain conventions and methods of engineering drawing.
				CO3	Apply concept of projections of points, lines, planes, solids and section of solids.
				CO4	Construct isometric and orthographic views of given objects.
	FY	Communication Skills	BTHM204	CO1	Apply speaking and writing skills in professional as well as social situations
				CO2	Overcome Mother Tongue Influence and demonstrate neutral accent while exercising English
				CO3	Apply communication skills for Presentations, Group Discussion and interpersonal interactions.
				CO4	Apply grammar correctly during Speaking and Writing situations especially in context with Presentations, Public Speaking, Report writing and Business Correspondence
	FY	Energy and Environment Engineering	BTES205	CO1	Identify conventional ,non conventional energy sources.
				CO2	Know and discuss power consuming and power developing devices for effective utilization and power consumption
				CO3	Identify various sources of air, water pollution and its effects.
				CO4	Know and discuss noise,soil, thermal pollution and Identify solid, biomedical and hazardous waste.
	FY	Basic Civil and Mechanical Engineering	BTES206CM	CO1	Identify various Civil Engineering materials and choose suitable material among various options.
				CO2	Apply principles of surveying to solve engineering problem
				CO3	Identify various Civil Engineering structural components and select appropriate structural system among various options
				CO4	Explain and define various properties of basic thermodynamics, materials and manufacturing processes.
				CO5	Know and discuss the working principle of various power consuming and power developing devices
	FY	Engineering Graphics Lab	BTES208GL	CO1	Apply technical drawing standards and conventions in engineering graphics.
				CO2	Utilize geometric construction techniques for precise engineering drawings.
				CO3	Interpret and produce orthographic and isometric projections of various engineering objects.
CO4				Enhance spatial reasoning and visualization skills through the projection of points, lines, planes, and solids.	
CO5				Integrate all learned skills to solve complex graphical problems and communicate technical information effectively through drawings.	



ACADEMIC YEAR	CLASS	COURSE NAME	COURSE CODE	CO NO	Course Outcome
2023-24 (EVEN SEM)	FY	Engineering Chemistry	BTBS202	CO1	Demonstrate knowledge of chemistry in technical fields.
				CO2	Bring adaptability to new developments in Engineering Chemistry and to acquire the skills required to become a perfect engineer.
				CO3	Develop the importance of water in industrial and domestic usage.
				CO4	Identify the concepts of Chemistry to lay the ground work for subsequent studies in various engineering fields.
				CO5	Examine a fuel and suggest alternative fuels.
	FY	Engineering Chemistry Lab	BTBS207L	CO1	To understand determination of hardness of water by edta or complexometric method.
				CO2	To analyse chlorine content of waste sample by precipitatin titration method.
				CO3	To detemine Dissolved oxygen in water sample by Winklers Iodometric method
				CO4	To understand concept of surface tension by number drop method.
				CO5	To determine viscosity of given liquid by ostwald viscometer.
	FY	Engineering Mechanics	BTES203	CO1	Apply fundamental Laws of Engineering Mechanics
				CO2	Apply Conditions of static equilibrium to analyze given force system
				CO3	Compute Centre of gravity and Moment of Inertia of plane surfaces
				CO4	Compute the motion characteristics of a body/particle for a Rectilinear and Curvilinear Motion
				CO5	Know and discuss relation between force and motion characteristics.
	FY	Computer Programmaning in C	BTES204	CO1	Gain a broad perspective about the uses of computers in engineering industry and C Programming.
				CO2	Develop the basic concept of algorithm, algorithmic thinking and flowchart.
				CO3	Apply the use of C programming language to implement various algorithms and develops the basic concepts and terminology of programming in general.
				CO4	Use the more advanced features of the C language.
				CO5	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.
FY	Workshop Practices	BTES205L	CO1	Fabricate components with their own hands.	
			CO2	Get practical knowledge of the dimensional accuracies tolerances applicable for different manufacturing processes.	
			CO3	Produce small devices of their interest for project or research purposes.	
FY	Basic Electrical and Electronics Engg.	BTES206	CO1	Apply basic ideas and principles of electrical engineering.	
			CO2	Identify protection equipment and energy storage devices	
			CO3	Differentiate electrical and electronics domains and explain the operation of diodes and transistors.	
			CO4	Acquire knowledge of digital electronics	
			CO5	Design simple combinational and sequential logic circuits.	

[Signature]
Head

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Director