SITYOG INSTITUTE OF TECHNOLOGY, AURANGABAD BIHAR

Programme Name : **B.Tech CIVIL Engineering**

PSO	Statement
1	To produce healthy professionals in industry, academia, teaching and research by collecting strong knowledge in the field of Civil Engineering.
2	To train the students to learn and adopt cutting edge technologies in the area of Civil Engineering.
3	To encourage the graduates for higher education to meet the diversified needs of electrical industry, academia and research.

S.No	Course Code	Course Name	Course Outcome	CO Statement
1	ESC202	Basic Electronics	CO1	Know broadly the concepts and functionalities of the electronic devices, tools and instruments
			CO2	Understand use, general specifications and deploy abilities of the electronic devices, and assemblies
			CO3	Confidence in handling and usage of electronic devices, tools and instruments in engineering applications
2	BSC109	Biology (Biology for Engineers)	CO1	To familiarize the students with the basic biological concepts and their engineering applications.
			CO2	To enable the students with an understanding of biodesign principles to create novel devices and structures.
			CO3	To provide the students an appreciation of how biological systems can be re-designed as substitute products for natural systems.
			CO4	To motivate the students develop the interdisciplinary vision of biological engineering.

Sr.	Course Code	Course Name	CO	Course Outcome
3	BSC202	Mathematics III (PDE, Probability & Statistics)	CO1	To introduce the solution methodologies for second order Partial Differential Equations with applications in engineering
			CO2	To provide an overview of probability and statistics to engineers
			CO3	students will be able to solve field problems in engineering involving PDEs
			CO4	They can also formulate and solve problems involving random variables
			CO5	Apply statistical methods for analysing experimental data
4	ESC205	Engineering Mechanics	CO1	Confidently tackle equilibrium equations, moments and inertia problems
			CO2	Master calculator/computing basic skills to use to advantage in solving mechanics problems
			CO3	Gain a firm foundation in Engineering Mechanics for furthering the career in Engineering
5	HSMC201	Humanities – I (Effective Technical Communication)	CO1	Acquisition of technical communication's generic aspects like Reading Technical Material, Technical Writing, Listening, Thinking and using technical phrases in spoken, Knowing the parts of a technical documents like screenshots, graphs, tabular data, data analysis, pictorial depiction.
			CO2	Getting adapted with the technical generic formats/templates of technical writing of memos, technical report writing, technical presentations, technical proposal writing, minutes of meeting and the notes taking techniques.
			CO3	Accessing the reading material and developing the writing technical material with the use of technical concepts and tools like Vacaroo, Microsoft Visio, Notepad ++, Kin master, PowToon, Split Page Technique, Diagram Technique.

#	Course Code	Course Name	CO	Description
			CO4	Learning the skill of proofreading and copy editing, paraphrasing and spinning using technical tools and manually using the knowledge of advance technical grammar.
6	HSMC251	Introduction to Civil Engineering	CO1	to give an understanding to the students of the vast breadth and numerous areas of engagement available in
			CO2	to motivate the student to pursue a career in one of the many areas of Civil Engineering with deep interest and keenness.
			CO3	To expose the students to the various avenues available for doing creative and innovative work in this field by showcasing the many monuments and inspiring projects of public utility.
7	PCC-CE206	Surveying and Geomatics	CO1	Work with survey observations, and perform calculations,
			CO2	Customary units of measure. Identify the sources of measurement errors and mistakes; understand the difference between accuracy and precision as it relates to distance, differential leveling, and angular measurements
			CO3	be familiar with the principals of recording accurate, orderly, complete, and logical field notes from surveying operations, whether recorded manually or with automatic data collection
			CO4	identify and calculate the errors in measurements and to develop corrected values for differential level circuits, horizontal distances and angles for open or closed-loop
			C05	operate an automatic level to perform differential and profile leveling; properly record notes; mathematically reduce and check levelling measurements,
8	ESC203	Computer-aided Civil Engineering Drawing	CO1	Develop Parametric design and the conventions of formal engineering drawing
			CO2	Produce and interpret 2D & 3D drawings
			CO3	Communicate a design idea/concept graphically/ visually
			CO4	Examine a design critically and with understanding of CAD - The student learn to interpret drawings; and to produce designs using a combination of 2D and 3D software

Sr. No.	Course Code	Course Name	CO	Course Outcome
9	PCC-CE202	Engineering Geology	CO1	As a students in the Bachelor of Engineering (Civil Engineering) will undertake courses in geology Such as Rock and mineral.
			CO2	Students are able to understand the different geological structures and their impact on civil engineering structure.
			CO3	Students are able to decide the suitable site selection for civil engineering structures
			CO4	Students are able to know the different geological hazards and its mitigation
			CO5	Students are able to understand the different method of geological exploration
			CO6	Students are able to identify the different rocks and minerals based on their property
			CO7	Students are able to understand the use of different rock and mineral
10	PCC-CE203	Disaster Preparedness & Planning Management	CO1	To Understand basic concepts in Disaster Management
			CO2	To Understand Definitions and Terminologies used in Disaster Management
			CO3	To Understand Types and Categories of Disasters
			CO4	To Understand the Challenges posed by Disasters
11	PCC-CE204	Introduction to Civil Engineering	CO1	Student are able to understand the fluid characteristics and their application in different material manufacturing
			CO2	Student are able to measure the pressures at various conditions with different types of pressure measuring devices
			CO3	Students are able to calculate the discharges of fluid
			CO4	Student are able to calculate the force acting on submerged bodies
			CO5	Students will be able to apply their knowledge of fluid mechanics in addressing problems in open channels.
			CO6	They will possess the skills to solve problems in uniform, gradually and rapidly varied flows in steady conditions

No.	Subject Code	Subject Name	CO	Course Outcome
			CO7	Problems pertain to design, construction as well as efficient working of various types of *hydraulics* structures and machines is considerably simplified by using dimensional analysis and model studies
12	PCC-CE205	Introduction to Solid Mechanics	CO1	Students are able to understand the behavior of material under different loading
			CO2	Student are able to understand and calculate the different type of stress like, simple stress, shear stress, direct stress and bending stress in the material
			CO3	Students are students are able to understand and calculate the shear force and bending moment for beam of different loading
			CO4	Students are able to calculate the deflection of beam for
13	PCC-CE207	Materials, Testing & Evaluation	CO1	Different materials used in civil engineering applications
			CO2	Planning an experimental program, selecting the test configuration, selecting the test specimens and collecting raw data
			CO3	Documenting the experimental program including the test procedures, collected data, method of interpretation and final results
			CO4	Operating the laboratory equipment including the electronic instrumentation, the test apparatus and the data collection system
			CO5	Measuring physical properties of common structural and geotechnical construction materials
			CO6	Interpreting the laboratory data including conversion of the measurements into engineering values and derivation of material properties (strength and stiffness) from the engineering values
14	PCC-CE208	Structural Analysis	CO1	After completion of this subject student will be able to analyze Fixed and continuous beams.
			CO2	Student will be able to analyze moving loads and will be able to draw influence line diagrams for simply supported beams
			CO3	Student will also be able to analyze columns
			CO4	Student will also be able to analyze three hinge arches and three hinge suspension bridges

Sr. No.	Subject	Code	CO	Course Outcome
			CO5	The student will have the knowledge on advanced methods of analysis of structures like flexibity and stiffness method, kanis method, Moment distribution method. Slope and deflection method.
			CO6	Students are able to do the analysis of beam by using advance method of analysis
15	Mechanical Engineering	ESC209	CO1	an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
			CO2	an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
			CO3	an ability to communicate effectively with a range of audiences
			CO4	an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
			CO5	an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
			CO6	an ability to acquire and apply new knowledge as needed, using appropriate learning strategies
16	Structural Analysis	PCC-CE208	CO1	After completion of this subject student will be able to analyze Fixed and continuous beams.
			CO2	Student will be able to analyze moving loads and will be able to draw influence line diagrams for simply supported beams
			CO3	Student will also be able to analyze columns
			CO4	Student will also be able to analyze three hinge arches and three hinge suspension bridges
			CO5	The student will have the knowledge on advanced methods of analysis of structures like flexibity and stiffness method, kanis method, Moment distribution method. Slope and deflection method.

Sr. No.	Code	Course	CO	Outcome
			CO6	Students are able to do the analysis of beam by using advance method of analysis
17	HSMC252	Civil Engineering – Societal & Global Impact	CO1	Awareness of the importance of Civil Engineering and the impact it has on the Society and at global levels.
			CO2	Awareness of the impact of Civil Engineering for the various specific fields of human endeavour
			CO3	Need to think innovatively to ensure Sustainability
18	PCC-CE303	Analysis and design Of Concrete structure	CO1	Students will be exposed to the theories and concepts of both concrete and steel design and analysis both at the element
			CO2	Hands-on design experience and skills will be gained and learned through problem sets and a comprehensive design project
			CO3	An understanding of real-world open-ended design issues will be developed
			CO4	Weekly recitations and project discussions will be held besides lectures
19	PCC-CE304	Geotechnical Engineering –I	CO1	Understand the different types of soil based on their formation mechanism
			CO2	Understand the various phase diagrams and derive various phase relationships of the soil
			CO3	Understand the behaviour of soils based on their moisture contents
			CO4	Determine the permeability of soils through various laboratory and field tests
			CO5	Analytically calculate the effective permeability of anisotropic soil mass
			CO6	Understand the physical significance of effective stress and its relation with pore pressure
20	PCC-CE302	Hydraulic Engineering	CO1	To introduce the students to various hydraulic engineering problems like open channel flows and hydraulic machines
			CO2	At the completion of the course, the student should be able to relate the theory and practice of problems in hydraulic engineering
			CO1	We as human being are not an entity separate from the environment around us rather we are a constituent seamlessly integrated and co-exist with the environment around us.

Sr. No.	Subject Code	Subject Name	CO	Course Outcome
21	MC 401	Environmental Science	CO2	We are not an entity so separate from the environment that we can think of mastering and it rather we must understand that each and every action of ours reflects on the environment and vice versa.
			CO3	Ancient wisdom drawn from Vedas about environment and its sustenance reflects this ethos.
			CO4	There is a direct application of this wisdom even in modern times.
22	PCC-CE301	Mechanics of Materials	CO1	Understand the behaviour under different loading actions
			CO2	Application of engineering principles to calculate the reactions, forces and moments
			CO3	Understand the energy methods used to derive the equations to solve engineering problems. Make use of the capabilities to determine the forces and moments for design
23	PCC-CE305	Hydrology and Water Resources Engineering	CO1	Understand the interaction among various processes in the hydrologic cycle
			CO2	Apply the application of fluid mechanics and use of computers in solving a host of $\emptyset$ problems in hydraulic engineering
			CO3	Understand application of systems concept, advanced optimization techniques to cover the socio-technical aspects in the field of water resources
			CO4	Apply the principles and applications of remote sensing, GPS and GIS in the context to hydrological extreme flood and drought events in water resources engineering
24	PCC-CE307	Transportation Engineering	CO1	Understand the principles and practices of transportation engineering and urban transportation planning.
			CO2	Understand the interactions between transportation planning and land use planning, economics, social planning and master plans
			CO3	Gain the facility of utilizing the state of the art techniques and models in the field

25	PCC-CE308	Construction Engineering & Management	CO1	On completion of this course the students will have the knowledge of construction equipment's practices and techniques to be used in the field.
			CO2	Be able to apply theoretical and practical aspects of project management techniques to achieve project goals.
26	PCC-CE303	Design Of Steel Structure	CO1	Students are able to design the connection of steel structure
			CO2	Students are able to design the tension and compression members
			CO3	Students are able to design the beam and roof truss in steel structure
			CO4	Students able to design the plate and gantry design
27	100103	Chemistry	CO1	Recall and analyze the issues related to impurities in water and their removal methods and apply recent methodologies in water treatment for domestic and industrial usage
			CO2	Evaluate the causes of metallic corrosion and apply the methods for corrosion protection of metals
			CO3	Evaluate the electrochemical energy storage systems such as lithium batteries, fuel cells and solar cells, and design for usage in electrical and electronic applications
			CO4	Assess the quality of different fossil fuels and create an awareness to develop the alternative fuels
			CO5	Analyze the properties of different polymers and distinguish the polymers which can be degraded and demonstrate their usefulness
			CO6	Apply the theoretical aspects: (a) in assessing the water quality; (b) understanding the construction and working of electrochemical cells; (c) analyzing metals, alloys and soil using instrumental methods; (d) evaluating the viscosity and water absorbing properties of polymeric materials
			CO1	Understand the working principle of a computer and identify the purpose of a computer programing language

Sr. No	Course Code	Course Name	CO	Course Outcome
28	100104	Problem Solving and Programming	CO2	Learn various problem solving approaches and ability to identify an appropriate approach to solve the problem
			CO3	Differentiate the programming Language constructs appropriately to solve any problem
			CO4	Solve various engineering problems using different data structures
			CO5	Able to modularize the given problem using structural approach of programming
			CO6	Efficiently handle data using flat files to process and store data for the given problem
29	100106	English	CO1	Apply language skills with ease in academic and real-life situations.
			CO2	Build up a job winning digital foot print and learn to face interviews confidently.
			CO3	Develop good interpreting and reporting skills to aid them in research.
			CO4	Comprehend language and communication skills in academic and social contexts.
			CO5	Acquire vocabulary and learn strategies for error-free communication.
30	100105	Workshop Manufacturing Process	CO1	Understand the appropriate tools, materials, instruments required for specific operations in workshop.
			CO2	Apply techniques to perform basic operations with hand tools and power tools such as center lathe machine, drilling machine using given job drawing.
			CO3	Understand the figures of the hand tools used in fitting, carpentry, foundry, welding shop and machine tools such as lathe machine and drilling machine.
			CO4	Understand a report related to hand tools and machine tools description referring to library books and laboratory manuals.
			CO5	Understand report of procedures followed for a given task in fitting, carpentry, foundry, sheet metals, welding and machine shops.
			CO6	Apply safety consciousness and show team work.

No.	Code	Subject	CO	Description
31	100104	Mathematics – 1 (Calculus and Differential Equation)	CO1	Explain the relationship between the derivative of a function as a function and the ...tion of the derivative as the slope of the tangent line to a function at a point.
			CO2	To find maxima and minima, critical points and inflection points of functions and to determine the concarity of curves.
			CO3	To able to evaluate integrals of rational functions by partial fractions.
			CO4	Distinguish between linear, nonlinear, partial and ordinary differential equations.
			CO5	Find power series solutions about ordinary points and singular points.
			CO6	Distinguish between linear, nonlinear, partial and ordinary differential equations.
			CO7	Obtain an approximate set of solution function values to a second order boundary value problem using a finite difference equation.
32	103201	Physics (Waves and Optics, and Introduction to Quantum Mechanics)	CO1	Understand concept of the Electromagnetic Waves and Dielectrics
			CO2	Understand concept of the Propagation of Light & Lasers applications
			CO3	Understand the role of uncertainty in quantum mechanics and knowledge of behavior of microscopic particle
	100201	Basic Electrical Engineering	CO1	To understand and analyze basic DC and AC circuits.
			CO2	To learn the use and working principle of single-phase transformers.
			CO3	To study the application and working principles of three phase and single-phase induction motors.
			CO4	To learn the components of low voltage electrical installations.
33	100202	Engineering Graphics and Design	CO1	To understand basic of engineering drawing and its principles.
			CO2	To get exposure to drawing, drafting techniques and interpretation of drawing scales.
			CO3	To learn about the projection of point, line, panes and regular solids.
			CO4	To learn about the development of surfaces.

| 34 | CO5 | To understand the concept of isometric and orthographic projections of simple and compound solids. |

SITYOG INSTITUTE OF TECHNOLOGY, AURANGABAD, BIHAR

Programme Name : **B.Tech Mechanical Engineering**

PSO	Statement
1	To produce healthy professionals in industry, academia, teaching and research by collecting strong knowledge in the field of Mechanical Engineering.

S.No	Course Code	Course Name	Course Outcome	CO Statement
1	PCC-ME 301	Heat Transfer	CO1	After completing the course, the students will be able to formulate and analyze a heat transfer problem involving any of the three modes of heat transfer
			CO2	to the three basic modes namely conduction, convection and radiation.
			CO3	Analyse circuits in the sinusoidal steady-state (single-phase and three-phase).
			CO4	Analyse two port circuit behavior.
2	PCC-ME 302	Fluid Machinery	CO1	Upon completion of this course, students will be able understand the deformation behavior of solids under different types of loading and obtain mathematical solutions for simple geometries.
			CO2	solids under different types of loading and obtain mathematical solutions for simple geometries.
			CO3	geometries.
			CO4	Understand the functioning of OP-AMP and design OP-AMP based circuits.

S. No	Course Code	Course Name	CO	Course Outcome
3	PCC-ME 303	Manufacturing Processes	CO1	Upon completion of this course, students will be able to understand the different conventional and unconventional manufacturing methods employed for making different products and unconventional manufacturing methods employed for making different products
			CO2	Understand the operation of dc machines.
			CO3	Analyse the differences in operation of different dc machine configurations.
			CO4	Analyse single phase and three phase transformers circuits.
4	PCC-ME 304	Kinematics of Machine	CO1	After completing this course, the students can design various types of linkage mechanisms for obtaining specific motion and analyse them for optimal functioning
			CO2	To obtain the electric and magnetic fields for simple configurations under static conditions.
			CO3	To analyse time varying electric and magnetic fields.
			CO4	To understand Maxwell's equation in different forms and different media.
			CO5	To understand the propagation of EM waves.
5	PCC-ME 306	Dynamics of Machinery	CO1	Analyze stabilization of sea vehicles, aircrafts and automobile vehicles.
			CO2	Understand the operation of acmachines.
			CO3	Analyze performance characteristics of acmachines.
6	PCC-ME 307	Manufacturing Technology	CO1	Upon completion of this course, students will be able to the tooling needed for manufacturing, the dimensional accuracy and tolerances of products, assembly of different components and the application of optimization methods in manufacturing
			CO2	analyze and solve the varieties of problems and issues coming up in the vast field of electrical measurements

S.No	Course code	Course name	CO	Course Outcome
			CO3	to think in terms of innovative ideas to improve the existing technology in the field of measurements in terms of accuracy, cost, durability and user friendliness
7	PCC-ME 308	Design of Machine Elements	CO1	Upon completion of this course, students will get an overview of the design methodologies employed for the design of various machine components.
			CO2	Analyse systems in complex frequency domain.
			CO3	Understand sampling theorem and its implications.
			CO4	Design and analyze various filter circuits using operational amplifiers.
8	100405	Mathematics – III (Probability and Statistics)	CO1	Understand the concept of random variables and solve the problems in mathematical expectations
			CO2	Analyze the properties and applications of various probability functions and Weak law of Large Numbers
			CO3	Apply the concept of Chebychev's inequality and solve the problems
			CO4	Compute probabilities using classical, statistical and axiomatic approach.
9	100406	Biology-I	CO1	Describe how biological observations of 18th Century that lead to major discoveries.
			CO2	Convey that classification per se is not what biology is all about but highlight the underlying criteria, such as morphological, biochemical and ecological
			CO3	Highlight the concepts of recessiveness and dominance during the passage of genetic material from parent to offspring
			CO4	Convey that all forms of life have the same building blocks and yet the manifestations are as diverse as one can imagine
			CO5	Classify enzymes and distinguish between different mechanisms of enzyme action
			CO6	Identify DNA as a genetic material in the molecular basis of information transfer.
			CO7	Analyse biological processes at the reductionistic level

#	Code	Course	CO	Description
10	ESC 201	Basic Electronics	CO1	CO2 : Students will gain knowledge regarding electrical machines and apply them for practical problems
			CO2	To obtain the electric and magnetic fields for simple configurations under static conditions.
			CO3	To analyse time varying electric and magnetic fields.
			CO4	To understand Maxwell's equation in different forms and different media.
			CO5	To understand the propagation of EM waves.
11	ESC 202	Engineering Mechanics	CO1	Understand the concepts of co-ordinate systems
			CO2	Analyse the three-dimensional motion.
			CO3	Understand the concepts of rigid bodies.
			CO4	Analyse the free-body diagrams of different arrangements.
			CO5	Analyse torsional motion and bending moment.
	PCC- ME 201	Thermodynamics	CO1	After completing this course, the students will be able to apply energy balance to systems and control volumes, in situations involving heat and work interactions
12			CO2	Design and implement Combinational and Sequential logic circuits.
			CO3	Understand the process of Analog to Digital conversion and Digital to Analog conversion
			CO4	Be able to use PLDIdentify the national and international standards pertaining to machine drawing
	PCC-ME 202	Machine Drawing	CO1	Understand the concepts of rotating magnetic fields.
			CO2	Understand the operation of acmachines.
13			CO3	Analyse performance characteristics of acmachines.
			CO1	Understand the concepts of continuous time and discrete time systems.
			CO2	Analyse systems in complex frequency domain.
	Fluid Mechanics		CO3	Understand sampling theorem and its implications.
14				To learn about of l law for reacting systems and heating value of fuels
			CO2	To learn about gas and vapor cycles and their first law and second law efficiencies

No.	Subject	CO	Description
15	Applied Thermodynamics	CO3	Apply the concept of Chebychev's inequality and solve the problems
		CO4	Compute probabilities using classical, statistical and axiomatic approach.
16	Strength of Materials	CO2	To understand the nature of stresses developed in simple geometries such as bars, cantilevers, beams, shafts, cylinders and spheres for various types of simple loads.
		CO3	To calculate the elastic deformation occurring in various simple geometries for different types of loading
		CO4	Highlight the concepts of recessiveness and dominance during the passage of genetic material from parent to offspring
		CO5	Classify enzymes and distinguish between different mechanisms of enzyme action
		CO6	Identify DNA as a genetic material in the molecular basis of information transfer.
		CO7	Analyse biological processes at the reductionistic level
		CO1	Understanding of the correlation between the internal structure of materials, their mechanical properties and various methods to quantify their mechanical integrity and failure criteria.
		CO2	To provide a detailed interpretation of equilibrium phase diagrams and Learning about different phases and heat treatment methods to tailor the properties of Fe-C alloys.
17	Engineering Materials	CO3	Evaluate fault currents for different types of faults.
		CO4	Understand the generation of over-voltages and insulation coordination.
		CO5	Understand basic protection schemes.
		CO6	Understand concepts of HVdc power transmission and renewable energy generation.

18		Instrumentation and Control	CO1	To provide a basic knowledge about measurement systems and their components
			CO2	To learn about various sensors used for measurement of mechanical quantities
19	100103	Chemistry	CO1	Recall and analyze the issues related to impurities in water and their removal methods and apply recent methodologies in water treatment for domestic and industrial usage
			CO2	Evaluate the causes of metallic corrosion and apply the methods for corrosion protection of metals
			CO3	Evaluate the electrochemical energy storage systems such as lithium batteries, fuel cells and solar cells, and design for usage in electrical and electronic applications
			CO4	Analyze the properties of different polymers and distinguish the polymers which can be degraded and demonstrate their usefulness
			CO5	Assess the quality of different fossil fuels and create an awareness to develop the alternative fuels
			CO6	Apply the theoretical aspects: (a) in assessing the water quality; (b) understanding the construction and working of electrochemical cells; (c) analyzing metals, alloys and soil using instrumental methods; (d) evaluating the viscosity and water absorbing properties of polymeric materials
	100104	Problem Solving and Programing	CO1	Understand the working principle of a computer and identify the purpose of a computer programing language
			CO2	Learn various problem solving approaches and ability to identify an appropriate approach to solve the problem
			CO3	Differentiate the programming Language constructs appropriately to solve any problem
			CO4	Solve various engineering problems using different data structures

#	Code	Course	CO	Outcome
20	100106	English	CO5	Able to modulate the given problem using structural approach of programming
			CO6	Efficiently handle data using flat files to process and store data for the given problem
			CO1	Apply language skills with ease in academic and real-life situations.
			CO2	Build up a job winning digital foot print and learn to face interviews confidently.
			CO3	Develop good interpreting and reporting skills to aid them in research.
			CO4	Comprehend language and communication skills in academic and social contexts.
			CO5	Acquire vocabulary and learn strategies for error-free communication.
21			CO1	Understand the appropriate tools, materials, instruments required for specific operations in workshop.
			CO2	Apply techniques to perform basic operations with hand tools and power tools such as center lathe machine, drilling machine using given job drawing.
			CO3	Understand the figures of the hand tools used in fitting, carpentry, foundry, welding shop and machine tools such as lathe machine and drilling machine.
			CO4	Understand a report related to hand tools and machine tools description referring to library books and laboratory manuals.
			CO5	Understand report of procedures followed for a given task in fitting, carpentry, foundry, sheet metals, welding and machine shops.
	100105	Workshop Manufacturing Process	CO6	Apply safety consciousness and show team work.
22			CO1	Explain the relationship between the derivative of a function and the notion of the derivative as the slope of the tangent line to a function at a point.
			CO2	To find maxima and minima, critical points and inflection points of functions and to determine the concarity of curves.

#	Code	Subject	CO	Description
23	100104	Mathematics – 1 (Calculus and Differential Equation)	CO3	To able to evaluate integrals of rational functions by partial fractions.
			CO4	Distinguish between linear, nonlinear, partial and ordinary differential equations.
			CO5	Find power series solutions about ordinary points and singular points.
			CO6	Distinguish between linear, nonlinear, partial and ordinary differential equations.
			CO7	Obtain an approximate set of solution function values to a second order boundary value problem using a finite difference equation.
24	103201	Physics (Waves and Optics, and Introduction to Quantum Mechanics)	CO1	Understand concept of the Electromagnetic Waves and Dielectrics
			CO2	Understand concept of the Propagation of Light & Lasers applications
			CO3	Understand the role of uncertainty in quantum mechanics and knowledge of behavior of microscopic particle
25	100201	Basic Electrical Engineering	CO1	To understand and analyze basic DC and AC circuits.
			CO2	To learn the use and working principle of single-phase transformers.
			CO3	To study the application and working principles of three phase and single-phase induction motors.
			CO4	To learn the components of low voltage electrical installations.
26	100202	Engineering Graphics and Design	CO1	To understand basic of engineering drawing and its principles.
			CO2	To get exposure to drawing, drafting techniques and interpretation of drawing scales.
			CO3	To learn about the projection of point, line, panes and regular solids.
			CO4	To learn about the development of surfaces.
			CO5	To understand the concept of isometric and orthographic projections of simple and compound solids.
			CO1	To familiarize with the terminology associated with IC engines

No	Code	Course Name	CO	Description
27	102701	INTERNAL COMBUSTION ENGINE	CO2	To understand the basics of IC engines
			CO3	To understand combustion, and various parameters and variables affecting it in various
			CO4	types of IC engines.
			CO1	To familiarize with the terminology associated with refrigeration systems and air conditioning
			CO2	To understand basic refrigeration processes
28	102702:	REFRIGERATION & AIR-CONDITIONING	CO3	To understand the basics of psychometric and practice of applied psychometrics
			CO4	To acquire the skills required to model, analyses and design different refrigeration as well as airconditioning processes and components.
29	102705:	AUTOMOBILE ENGINEERING	CO1	To understand the construction and working principle of various parts of an automobile
30	102807	SAFETY MANAGEMENT	CO1	This course is directed towards creating safety awareness, identifying hazards and mitigation of accidents along with introduction of legal requirements and following up action.
31	102808:	NON-CONVENTIONAL MANUFACTURING	CO1	To understand how the material removal by using various energy and to know how the new materials and complex parts are produced with high accuracy by using new technology.
32	102804:	ENERGY CONSERVATION AND MANAGEMENT	CO1	To understand the energy data from industries and carry out energy audit for energy savings
33	100808:	TOTAL QUALITY MANGEMENT	CO1	To facilitate the understanding of total quality management principles and processes

SITYOG INSTITUTE OF TECHNOLOGY, AURANGABAD, BIHAR

Programme Name : B.Tech Electrical Engineering

PSO	Statement
1	To produce healthy professionals in industry, academia, teaching and research by collecting strong knowledge in the field of Electrical Engineering.
2	To train the students to learn and adopt cutting edge technologies in the area of Electrical Engineering.
3	To encourage the graduates for higher education to meet the diversified needs of electrical industry, academia and research.

S.No	Course Code	Course Name	Outcome	CO Statement
1	100306	Electrical Circuit Analysis	CO1	Apply network theorems for the analysis of electrical circuits.
			CO2	Obtain the transient and steady-state response of electrical circuits.
			CO3	Analyse circuits in the sinusoidal steady-state (single-phase and three-phase).
			CO4	Analyse two port circuit behavior.
2	100302	Analog Electronics	CO1	Understand the characteristics of transistors.
			CO2	Design and analyse various rectifier and amplifier circuits.
			CO3	Design sinusoidal and non-sinusoidal oscillators.
			CO4	Understand the functioning of OP-AMP and design OP-AMP based circuits
3	100307	Electrical Machines – I	CO1	Understand the concepts of magnetic circuits.
			CO2	Understand the operation of dc machines.
			CO3	Analyse the differences in operation of different dc machine configurations.
			CO4	Analyse single phase and three phase transformers circuits.
			CO1	To understand the basic laws of electromagnetism.
4	100303	Electromagnetic Fields	CO2	To obtain the electric and magnetic fields for simple configurations under static conditions.

#	Code	Subject	CO	Description
4	100303	Engineering Fields	CO3	To analyse time varying electric and magnetic fields.
			CO4	To understand Maxwell's equation in different forms and different media.
			CO5	To understand the propagation of EM waves.
5	100301	Engineering Mechanics	CO1	Understand the concepts of co-ordinate systems
			CO2	Analyse the three-dimensional motion.
			CO3	Understand the concepts of rigid bodies.
			CO4	Analyse the free-body diagrams of different arrangements.
			CO5	Analyse torsional motion and bending moment.
6	100403	Digital Electronics	CO1	Understand working of logic families and logic gates
			CO2	Design and implement Combinational and Sequential logic circuits.
			CO3	Understand the process of Analog to Digital conversion and Digital to Analog conversion
			CO4	Be able to use PLDs to implement the given logical problem.
7	100401	Electrical Machines-II	CO1	Understand the concepts of rotating magnetic fields
			CO2	Understand the operation of acmachines.
			CO3	Analyse performance characteristics of acmachines.
8	100402	Electrical and Electronics Measurement	CO1	work on of various instruments and equipments used for the measurement of various electrical engineering
			CO2	analyze and solve the varieties of problems and issues coming up in the vast field of electrical measurements
			CO3	to think in terms of innovative ideas to improve the existing technology in the field of measurements in terms of accuracy, cost, durability and user friendliness
9	100404	Signal & Systems	CO1	Understand the concepts of continuous time and discrete time systems.
			CO2	Analyse systems in complex frequency domain.
			CO3	Understand sampling theorem and its implications.
			CO4	Design and analyze various filter circuits using operational amplifiers.
10	100405	Mathematics – III (Probability and Statistics)	CO1	Understand the concept of random variables and solve the problems in mathematical expectations
			CO2	Analyze the properties and applications of various probability functions and Weak law of Large Numbers
			CO3	Apply the concept of Chebychev's inequality and solve the problems
			CO4	Compute probabilities using classical, statistical and axiomatic approach.

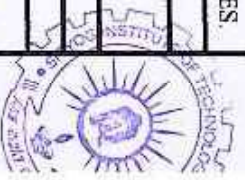| S.No	Code	Course	CO	Description
11	100406	Biology-I	CO1	Describe how biological observations of 18th Century that lead to major discoveries.
			CO2	Convey that classification per se is not what biology is all about but highlight the underlying criteria, such as morphological, biochemical and ecological
			CO3	Highlight the concepts of recessiveness and dominance during the passage of genetic material from parent to offspring
			CO4	Convey that all forms of life have the same building blocks and yet the manifestations are as diverse as one can imagine
			CO5	Classify enzymes and distinguish between different mechanisms of enzyme action
			CO6	Identify DNA as a genetic material in the molecular basis of information transfer.
			CO7	Analyse biological processes at the reductionistic level
12	100501	Power Systems-I (Apparatus and Modeling)	CO1	Understand the concepts of power systems
			CO2	Understand the various power system components.
			CO3	Evaluate fault currents for different types of faults.
			CO4	Understand the generation of over-voltages and insulation coordination.
			CO5	Understand basic protection schemes.
			CO6	Understand concepts of HVdc power transmission and renewable energy generation.
13	100502	Control Systems	CO1	Understand the modelling of linear-time-invariant systems using transfer function and state- space representations.
			CO2	Understand the concept of stability and its assessment for linear-time invariant systems
14	100504	Microprocessors	CO1	Do assembly language programming.
			CO2	Do interfacing design of peripherals like I/O, A/D, D/A, timer etc.
			CO3	Develop systems using different microcontrollers.
			CO1	Understand the differences between signal level and power level devices.
15	100506	Power Electronics	CO2	Analyse controlled rectifier circuits.
			CO3	Analyse the operation of DC-DC choppers.
			CO4	Analyse the operation of voltage source inverters.
			CO1	Use numerical methods to analyse a power system in steady state.
			CO2	Understand stability constraints in a synchronous grid.

			CO3	Understand methods to control the voltage, frequency and power flow.
16	103601	Power Systems-II	CO4	Understand the monitoring and control of a power system.
			CO5	Understand the basics of power system economics.
			CO1	Understand the practical issues related to practical implementation of applications using electronic circuits.
17	100609	Electronics Design Laboratory	CO2	Choose appropriate components, software and hardware platforms.
			CO3	Design a Printed Circuit Board, get it made and populate/solder it with components.
			CO4	Work as a team with other students to implement an application.
			CO1	To learn various interpersonal skills
			CO2	To help in developing various professionals skills.
18	100608	Professional Skill Development	CO3	To cover the facets of verbal and non-verbal languages, public speech, reading gestures and body languages, preparing for group discussion and enhancing presentations skills.
			CO4	To enable learners to speak fluently and flawlessly in all kinds of communicative Contexts with speakers of all nationalities.
			CO1	Describe the operation of electric drives and its classification.
			CO2	Explain the electric drive stability and selection of motor power rating.
19	100613	Electric Drive	CO3	Illustrate electric braking and its dynamics.
			CO4	Describe the types of DC drives and its control.
			CO5	Describe the types of AC drives and its control.
			CO1	Design and development of high voltage equipments and utility establishment.
20	103605	High Voltage Engineering	CO2	Analyze and measure the magnitude of HVDC, HVAC (power frequency & high frequency) and impulse by different measurement schemes.
			CO3	Conduct high voltage test of materials and apparatus
			CO4	Evaluate the form of discharges in Gaseous, Liquid and Solid dielectrics.
			CO1	Represent signals mathematically in continuous and discrete-time, and in the frequency domain.
21	100606	Digital Signal Processing	CO2	Analyse discrete-time systems using z-transform
			CO3	Understand the Discrete-Fourier Transform (DFT) and the FFT algorithms.
			CO4	Design digital filters for various applications.
			CO5	Apply digital signal processing for the analysis of real-life signals

No.	Code	Course	CO	Course Outcome
22	103704	Electromagnetic Waves	CO1	Analyse transmission lines and estimate voltage and current at any point on transmission line for different load conditions.
			CO2	Provide solution to real life plane wave problems for various boundary conditions.
			CO3	Analyse the field equations for the wave propagation in special cases such as lossy and low loss dielectric media.
			CO4	Visualize TE and TM mode patterns of field distributions in a rectangular wave-guide
			CO5	Understand and analyse radiation by antennas.
23	103712	Power System Protection	CO1	Understand the types of Circuit breakers and choice of Relays for appropriate protection of power system equipment.
			CO2	Understand various types of Protective devices in Electrical Power Systems.
			CO3	Interpret the existing transmission voltage levels and various means to protect the system against over voltages.
			CO4	Understand the importance of Neutral Grounding, Effects of Ungrounded Neutral grounding on system performance, Methods and Practices
24	103701	Power Plant Engineering	CO1	To create awareness about various sources of energy, working of thermal power plants and combustionprocess
			CO2	To understand how Diesel and gas power plants arefunctioning
			CO3	To understand how power is achieved from renewable sources of energy and functions of hydro-electric powerplants
			CO4	Able to learn about Nuclear powerplants
			CO5	To apply the concepts of economics in powerplants
25	103715	Electrical Materials	CO1	To understand about conducting materials.
			CO2	To apply the concepts of semiconductors magnetic materials.
			CO3	To create awareness about MODERN TECHNIQUES FOR MATERIALS STUDIES.
26	100815	Digital Image Processing	CO1	To become familiar with digital image fundamentals
			CO2	To get exposed to simple image enhancement techniques in Spatial and Frequency domain.
			CO3	To learn concepts of degradation function and restoration techniques.
			CO4	To study the image segmentation and representation techniques.
			CO1	To become familiar with image compression and recognition methods

No.	Code	Subject	CO	Description
27	103804	Computer Networks	CO2	To introduce the student to the major concepts involved in wide-area networks (WANs), local area networks (LANs) and Wireless LANs (WLANs)
			CO3	To provide an opportunity to do network programming
			CO4	To provide a WLAN measurement ideas.
28	103801	Electrical and Hybrid Vehicles	CO1	Understand the models to describe hybrid vehicles and their performance
			CO2	Understand the different possible ways of energy storage.
			CO3	Understand the different strategies related to energy storage systems.
29	100804	Power Quality and Facts	CO1	Understand the characteristics of ac transmission and the effect of shunt and series reactive compensation.
			CO2	Understand the working principles of FACTS devices and their
			CO3	Understand the basic concepts of power quality.
			CO4	Understand the working principles of devices to improve power quality.
30	100103	Chemistry	CO1	Recall and analyze the issues related to impurities in water and their removal methods and apply recent methodologies in water treatment for domestic and industrial usage
			CO2	Evaluate the causes of metallic corrosion and apply the methods for corrosion protection of metals
			CO3	Evaluate the electrochemical energy storage systems such as lithium batteries, fuel cells and solar cells, and design for usage in electrical and electronic applications
			CO4	Assess the quality of different fossil fuels and create an awareness to develop the alternative fuels
			CO5	Analyze the properties of different polymers and distinguish the polymers which can be degraded and demonstrate their usefulness
			CO6	Apply the theoretical aspects: (a) in assessing the water quality; (b) understanding the construction and working of electrochemical cells; (c) analyzing metals, alloys and soil using instrumental methods; (d) evaluating the viscosity and water absorbing properties of polymeric materials
			CO1	Understand the working principle of a computer and identify the purpose of a computer programing language
			CO2	Learn various problem solving approaches and ability to identify an appropriate approach to solve the problem

31	100104	Problem Solving and Programming	CO3	Differentiate the programming Language constructs appropriately to solve any problem
			CO4	Solve various engineering problems using different data structures
			CO5	Able to modularize the given problem using structural approach of programming
			CO6	Efficiently handle data using flat files to process and store data for the given problem
32	100106	English	CO1	Apply language skills with ease in academic and real-life situations.
			CO2	Build up a job winning digital foot print and learn to face interviews confidently.
			CO3	Develop good interpreting and reporting skills to aid them in research.
			CO4	Comprehend language and communication skills in academic and social contexts.
			CO5	Acquire vocabulary and learn strategies for error-free communication.
33	100105	Workshop Manufacturing Process	CO1	Understand the appropriate tools, materials, instruments required for specific operations in workshop.
			CO2	Apply techniques to perform basic operations with hand tools and power tools such as center lathe machine, drilling machine using given job drawing.
			CO3	Understand the figures of the hand tools used in fitting, carpentry, foundry, welding shop and machine tools such as lathe machine and drilling machine.
			CO4	Understand a report related to hand tools and machine tools description referring to library books and laboratory manuals.
			CO5	Understand report of procedures followed for a given task in fitting, carpentry, foundry, sheet metals, welding and machine shops.
			CO6	Apply safety consciousness and show team work.
34	100104	Mathematics – I (Calculus and Differential Equation)	CO1	Explain the relationship between the derivative of a function as a function and the notion of the derivative as the slope of the tangent line to a function at a point.
			CO2	To find maxima and minima, critical points and inflection points of functions and to determine the concarity of curves.
			CO3	To able to evaluate integrals of rational functions by partial fractions.
			CO4	Distinguish between linear, nonlinear, partial and ordinary differential equations.
			CO5	Find power series solutions about ordinary points and singular points.

No.	Code	Subject	CO	Course Outcome
35	103201	Physics (Waves and Optics, and Introduction to Quantum Mechanics)	CO6	Distinguish between linear, nonlinear, partial and ordinary differential equations.
			CO7	Obtain an approximate set of solution function values to a second order boundary value problem using a finite difference equation.
			CO1	Understand concept of the Electromagnetic Waves and Dielectrics
			CO2	Understand concept of the Propagation of Light & Lasers applications
			CO3	Understand the role of uncertainty in quantum mechanics and knowledge of behavior of microscopic particle
36	100201	Basic Electrical Engineering	CO1	To understand and analyze basic DC and AC circuits.
			CO2	To learn the use and working principle of single-phase transformers.
			CO3	To study the application and working principles of three phase and single-phase induction motors.
			CO4	To learn the components of low voltage electrical installations.
37	100202	Engineering Graphics and Design	CO1	To understand basic of engineering drawing and its principles.
			CO2	To get exposure to drawing, drafting techniques and interpretation of drawing scales.
			CO3	To learn about the projection of point, line, panes and regular solids.
			CO4	To learn about the development of surfaces.
			CO5	To understand the concept of isometric and orthographic projections of simple and compound solids.

SITYOG INSTITUTE OF TECHNOLOGY, AURANGABAD, BIHA

Programme Name : B.Tech Computer Science Engineering

	PSO	Statement
	1	To produce healthy professionals in industry, academia, teaching and research by collecting strong knowledge in the field of Computer Science Engineering.

S.No	Course Code	Course Name	Course Outcome	CO Statement
1	PCC CS 501-	Database Management Systems.	CO1	To understand the different issues involved in the design and implementation of a database system
			CO2	To study the physical and logical database designs, database modeling, relational, hierarchical, and network models.
			CO3	To understand and use data manipulation language to query, update, and manage a database.
			CO4	To develop an understanding of essential DBMS concepts such as: database security, integrity, concurrency, distributed database, and intelligent database, Client/Server (Database Server), Data Warehousing.
2	PCC CS 502	Formal Language & Automata Theory.	CO1	To develop a formal notation for strings, languages and machines.
			CO2	To design finite automata to accept a set of strings of a language.
			CO3	To prove that a given language is regular and apply the closure properties of languages
			CO4	Design context free grammars to generate strings from a context free language and convert them into normal forms.
			CO1	Understand the broader context of Artificial Intelligence.

#	Course Code	Course Name	CO	Course Outcome
3	PCC CS 503	Artificial Intelligence.	CO2	To help in developing various professionals skills.
			CO3	Build intelligent agents for search and games.
			CO4	Solve AI problems through programming with Python.
4	HSMC 501	Professional Skill Development	CO1	To learn various interpersonal skills.
			CO2	To obtain the electric and magnetic fields for simple configurations under static conditions.
			CO3	To cover the facets of verbal and non-verbal languages, public speech, reading gestures and body languages, preparing for group discussion and enhancing presentations skills.
			CO4	To enable learners to speak fluently and flawlessly in all kinds of communicative Contexts with speakers of all nationalities.
			CO5	Student can able to write their resume and can prepare for presentation, group discussion and interview.
5	PCC CS 504	Software Engineering	CO1	Be successful professionals in the field with solid fundamental knowledge of software engineering.
			CO2	Utilize and exhibit strong communication and interpersonal skills, as well as professional and ethical principles when functioning as members and leaders of multi-disciplinary teams.
			CO3	Apply their foundations in software engineering to adapt to readily changing environments using the appropriate theory, principles and processes.
6	PCC CS 601	Complier Design.	CO1	To understand and list the different stages in the process of compilation.
			CO2	Identify different methods of lexical analysis.
			CO3	Design top-down and bottom-up parsers.
7	PCC-IT602	Computer Networks.	CO1	To develop an understanding of modern network architectures from a design and performance perspective.
			CO2	To introduce the student to the major concepts involved in wide-area networks (WANs), local area networks (LANs) and Wireless LANs (WLANs).
			CO3	To provide an opportunity to do network programming

No.	Code	Subject	CO	Description
8	100103	Chemistry	CO1	Recall and analyze the issues related to impurities in water and their removal methods and apply the recent methodologies in water treatment for domestic and industrial usage
			CO2	Evaluate the causes of metallic corrosion and apply the methods for corrosion protection of metals
			CO3	Evaluate the electrochemical energy storage systems such as lithium batteries, fuel cells and solar cells, and design for usage in electrical and electronic applications
			CO4	Assess the quality of different fossil fuels and create an awareness to develop the alternative fuels
			CO5	Analyze the properties of different polymers and distinguish the polymers which can be degraded and demonstrate their usefulness
			CO6	Apply the theoretical aspects: (a) in assessing the water quality; (b) understanding the construction and working of electrochemical cells; (c) analyzing metals, alloys and soil using instrumental methods; (d) evaluating the viscosity and water absorbing properties of polymeric materials
9	100104	Problem Solving and Programming	CO1	Understand the working principle of a computer and identify the purpose of a computer programing language
			CO2	Learn various problem solving approaches and ability to identify an appropriate approach to solve the problem
			CO3	Differentiate the programming Language constructs appropriately to solve any problem
			CO4	Solve various engineering problems using different data structures
			CO5	Able to modularize the given problem using structural approach of programming
			CO6	Efficiently handle data using flat files to process and store data for the given problem
			CO1	Apply language skills with ease in academic and real-life situations.

S. No.	Course Code	Course Name	CO	Course Outcome
10	100106	English	CO2	Build up a job winning digital foot print and learn to face interviews confidently.
			CO3	Develop good interpreting and reporting skills to aid them in research.
			CO4	Comprehend language and communication skills in academic and social contexts.
			CO5	Acquire vocabulary and learn strategies for error-free communication.
11	100105	Workshop Manufacturing Process	CO1	Apply techniques to perform basic operations with hand tools and power tools such as center lathe machine, drilling machine using given job drawing.
			CO2	Understand the figures of the hand tools used in fitting, carpentry, foundry, welding shop and machine tools such as lathe machine and drilling machine.
			CO3	Understand a report related to hand tools and machine tools description referring to library books and laboratory manuals.
			CO4	Understand report of procedures followed for a given task in fitting, carpentry, foundry, sheet metals, welding and machine shops.
			CO5	Apply safety consciousness and show team work.
	100104	Mathematics – I (Calculus and Differential Equation)	CO1	Explain the relationship between the derivative of a function as a function and the notion of the derivative as the slope of the tangent line to a function at a point.
			CO2	To find maxima and minima, critical points and inflection points of functions and to determine the concavity of curves.
			CO3	To able to evaluate integrals of rational functions by partial fractions.
			CO4	Distinguish between linear, nonlinear, partial and ordinary differential equations.
			CO5	Find power series solutions about ordinary points and singular points.
			CO6	Distinguish between linear, nonlinear, partial and ordinary differential equations.

12			CO7	Obtain an approximate set of solution function values to a second order boundary value problem using a finite difference equation.
13	103201	Physics (Waves and Optics, and Introduction to Quantum Mechanics)	CO1	Understand concept of the Electromagnetic Waves and Dielectrics
			CO2	Understand concept of the Propagation of Light & Lasers applications
			CO3	Understand the role of uncertainty in quantum mechanics and knowledge of behavior of microscopic particle
14	100201	Basic Electrical Engineering	CO1	To understand and analyze basic DC and AC circuits.
			CO2	To learn the use and working principle of single-phase transformers.
			CO3	To study the application and working principles of three phase and single-phase induction motors.
			CO4	To learn the components of low voltage electrical installations.
15	100202	Engineering Graphics and Design	CO1	To understand basic of engineering drawing and its principles.
			CO2	To get exposure to drawing, drafting techniques and interpretation of drawing scales.
			CO3	To learn about the projection of point, line, panes and regular solids.
			CO4	To learn about the development of surfaces.
			CO5	To understand the concept of isometric and orthographic projections of simple and compound solids.