

**Phaltan Education Society's**  
**College of Engineering, Phaltan**  
**Department of Civil Engineering**

**Vision :** To providing a quality engineering education to the students from the rural area to develop attitudes, skills, values in the field of Civil Engineering and to prepare nationally competitive civil engineering students for a successful career in civil engineering.

**Mission:** To provide students with a strong, broad-based civil engineering education which elevate technical, social, entrepreneurial & communication skills of students so that they are capable of facing the technical and social challenges and scale up their employability potential, encourage the spirit of enterprise in them.

**Program Outcomes:**

**1. Engineering knowledge:** A civil engineering graduates will have basic knowledge of mathematics, science and engineering and a sound foundation of basics/fundamentals of civil engineering principles.

**2. Problem analysis:** A civil engineering graduate will develop an ability to identify, formulate and solve specific civil engineering problem.

**3. Design/development of solutions:** A civil engineering graduate will be well versed with the experimental methods and will develop an ability to design project integrating the experimental methods. He/she will be able to interpret data.

**4. Conduct investigations of complex problems:** A civil engineering graduate will demonstrate an ability to work on multidisciplinary tasks using his/her basic understanding of core subjects

**5. Modern tool usage:** A civil engineering graduate will be familiar with modern engineering tools, software and equipment.

**6. The engineer and society:** A civil engineering graduate will be aware about his/her social responsibilities; a civil engineering graduate will be having qualities of good citizen and good human beings also.

**7. Ethics:** A civil engineering graduates will be well aware about professional and ethical responsibilities.

**8. Environment and sustainability:** A civil engineering graduate will be aware about sustainable development aspect and environmental friendly technologies.

**9. Individual and team work:** A civil Engineering graduate will Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

**10. Communication:** A civil engineering graduate will have good communication skills to express his/her knowledge.

**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:** A Civil Engineering graduate will be aware of the latest developments in the arena of civil engineering.

### Program Educational Outcomes

1. To develop conducive educational environment which develops confidence and stimulates innovative thinking where students can reach their full potential in civil Engineering.
2. To inculcate the value systems & ethics, leadership and team work skills, bring holistic development of personality and to promote entrepreneurial thinking among students.
3. A civil engineering student has access to the public sector for employment and opportunities in private sectors with leading construction companies
4. To train students in such as a way that they can pursue higher studies so that they can contribute to the teaching profession/ research and development of civil engineering and other allied fields.

### Program Outcomes (PO) and their mapping with PEO's

Sr. No	Program Outcomes	Program Educational outcomes
1	<b>Engineering knowledge:</b> A civil engineering graduates will have basic knowledge of mathematics, science and engineering and a sound foundation of basics/fundamentals of civil engineering principles.	3,4
2	<b>Problem analysis:</b> A civil engineering graduate will develop an ability to identify, formulate and solve specific civil engineering problem.	1,4

3	<b>Design/development of solutions:</b> A civil engineering graduate will be well versed with the experimental methods and will develop an ability to design project integrating the experimental methods. He/she will be able to interpret data.	1,4
4	<b>Conduct investigations of complex problems:</b> A civil engineering graduate will demonstrate an ability to work on multidisciplinary tasks using his/her basic understanding of core subjects	1,3,4
5	<b>Modern tool usage:</b> A civil engineering graduate will be familiar with modern engineering tools, software and equipment.	1,2,4
6	<b>The engineer and society:</b> A civil engineering graduate will be aware about his/her social responsibilities; a civil engineering graduate will be having qualities of good citizen and good human beings also.	1,2
7	<b>Ethics:</b> A civil engineering graduates will be well aware about professional and ethical responsibilities.	2
8	<b>Environment and sustainability:</b> A civil engineering graduate will be aware about sustainable development aspect and environmental friendly technologies	1,2
9	<b>Individual and team work:</b> A civil Engineering graduate will Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.	1,2,3
10	<b>Communication:</b> A civil engineering graduate will have good communication skills to express his/her knowledge.	1,3
11	<b>Project management and finance:</b> 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.	1,3
12	<b>Life-long learning:</b> A Civil Engineering graduate will be aware of the latest developments in the arena of civil engineering.	1,4

## Course Outcome

### Course Name: Engineering Mathematics-III

CE201.1	Solve Linear Differential Equations and apply them to realistic problems
CE201.2	Solve Partial Differential Equations for solving problems in Civil Engineering.
CE201.3	Understand Application of Probability in Civil Engineering.
CE201.4	Apply knowledge of Vector Calculus to solve engineering problems.
CE201.5	Solve Laplace Transform and Inverse Laplace Transforms.
CE 201.6	Understand, recall and apply the concepts underlying the course.

### Course Name: Surveying

CE202.1	Determine linear and angular measurements.
CE202.2	Record various measurements in the field book.
CE202.3	Find areas of irregular figures.
CE202.4	Prepare plans and sections required for civil engineering projects.

### Course Name: Strength Of Material

CE203.1	Calculates the response of elastic body for external actions.
CE203.2	List the different engineering properties and behaviour of the materials
CE203.3	Computes the design forces.
CE203.4	Analyse the stress, strain and deformation of elastic bodies under external actions

### Course Name: Fluid Mechanics-I

CE204.1	Know the processes and science of fluids. Understand the index properties of soil.
CE204.2	Study the basic properties of fluids and their behaviour under application of various force systems.
CE204.3	Discuss the basic concepts and principles in fluid statics, fluid kinematics and fluid dynamics with their applications in fluid flow problems.
CE204.4	Identify and obtain values of fluid properties and relationship between them.
CE204.5	Recognize the principles of continuity, momentum and energy as applied to fluid in motion.
CE204.6	Recognize the principles written in form of mathematical equations and to apply these equations to analyse problems by making proper assumptions and learn systematic engineering methods to solve practical fluid mechanics problems. Determine the earth pressure on retaining structures.

### Course Name: Building Construction

CE205.1	Know the building Materials.
CE205.2	Describe properties and suitability of various building materials.

CE205.3	State the different building components.
CE205.4	Demonstrate different bonds in brick masonry.
CE205.5	Produce drawings of different building components.
CE205.6	Explain different types of roof coverings.
CE205.7	Describe different types of flooring.

**Course Name: Numerical Method**

CE206.1	Apply the techniques, skills, Knowledge of mathematics, science and modern engineering tools necessary for engineering practice.
CE206.2	Develop programs in C and C++, where applications will be drawn from different fields of civil engineering so as to motivate individual interests of students and to equip them with basic computing tools for civil engineering applications

**Course Name: Structural Mechanics**

CE207.1	Identify the response of elastic body for external actions.
CE207.2	Distinguish engineering properties of the materials are understood
CE207.3	Compute the design forces in the structures.
CE207.4	Analyse the stress, strain and deformation of elastic bodies under external forces

**Course Name: Surveying II**

CE208.1	Adopt the principles of advanced surveying instruments.
CE208.2	Formulate triangulation stations; Flight planning and Ground control points (GCPs).
CE208.3	Apply GIS and GPS concepts to civil engineering problems.
CE208.4	Apply aerial photogrammetry to civil engineering problems.

**Course Name: Concrete Technology**

CE209.1	Impart knowledge of physical properties of ingredients of concrete and their effect on strength And durability.
CE209.2	Explain the fundamentals of process of making good quality concrete and its elastic properties.
CE209.3	Enhance the confidence level of students to design the concrete mix proportion as per Indian standard code of practice.
CE209.4	Demonstrate Non Destructive Testing (NDT) and evaluate quality of existing concrete.

**Course Name: Fluid Mechanics-II**

CE210.1	To provide students with basic knowledge of fluid properties and utilizing principles developed in fluid mechanics.
CE210.2	To develop the principle and equation for pressure flow and momentum analysis.

CE210.3	Provide the students with the analytical knowledge of pressure and velocity distribution in an open channel in order to solve practical problems.
CE210.4	To illustrate and develop the equations and design principles for open channel flows, including sanitary and storm sewer design and flood control hydraulics.

**Course Name: Building Design And Drawing**

CE211.1	Know principles of building planning.
CE211.2	Describe Building By-Laws and regulations.
CE211.3	To plan and draw residential building considering principle of planning and Building By-Laws and regulations.
CE211.4	Explain techniques of maintenance, repair and rehabilitation of structure.
CE211.5	Draw the working drawing of foundation detail, plumbing and electrification of building.
CE211.6	Illustrate the concept of ventilation, air conditioning and thermal insulation.
CE211.7	Describe different types of building finishes.

**Course Name: Auto Cad**

CE212.1	Describe Auto-CAD commands.
CE212.2	Draw 2D Auto-CAD drawing of residential building.
CE212.3	Draw municipal and working drawings.

**Course Name: Water Resource Engineering I**

CE301.1	Apply the knowledge of estimation of hydro meteorological parameters
CE301.2	Design of efficient hydraulic structures
CE301.3	To develop different methods of efficient irrigation and water conservation
CE301.4	To develop the methods of consumptive use of surface water and groundwater

**Course Name: Design of Steel Structure**

CE302.1	List the essential elements necessary to analyse steel structures.
CE302.2	Analyse and design different types of bolted & welded connections
CE302.3	Demonstrate the knowledge of common sections subjected tension & its design, tension & its design, concept of net area & gross area.
CE302.4	Analyse and design compression members (struts).
CE302.5	Analyse and design of steel column, column bases & its elements.
CE302.6	Analyse and design laterally supported & unsupported beams.
CE302.7	Calculate forces acting on the gantry girder & its design

**Course Name: Environmental Engineering-I**

CE303.1	Describe the various sources of water with respect to quality and quantity of water.
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CE303.2	Describe and design the various water treatment units.
CE303.3	Illustrate the special water treatments and sequencing of treatment for various qualities of surface & ground water.
CE303.4	Design the various components related to transmission and distribution of water.
CE303.5	Summarize the different water supply appurtenances.
CE303.6	Explain the principles of green building.

**Course Name: Geotechnical Engineering-I**

CE304.1	Understand the index properties of soil.
CE304.2	Characterize the soil based on size, shape, index properties plasticity.
CE304.3	Understand the concept of total stress, effective stress pore water pressure in soil.
CE304.4	Understand the process of compaction and consolidation.
CE304.5	Understand the shear strength of soil.
CE304.6	Determine the earth pressure on retaining structures.
CE304.7	Perform different laboratory tests to determine index and engineering properties of soil.

**Course Name: Transportation Engineering-I**

CE305.1	Design features such as super-elevation sight distance section of road in cutting and filling
CE305.2	Design flexible and rigid pavement as per IRC.
CE305.3	Carryout quality control for WBM, BBM, and concrete pavements.
CE305.4	Design and plan airport, runways terminals buildings, hangers and aprons.
CE305.5	Plan different methods of tunnelling in soft and hard rocks
CE305.6	Plan and layout for docks and ports.

**Course Name: Building Planning And Design**

CE306.1	Specify dimensions and space requirements for various elements of the building in relation to human body measurements.
CE306.2	Explain various principles of planning of buildings and architectural compositions
CE306.3	Plan and design various public buildings using principles planning
CE306.4	Illustrate the procedures for preparing perspective drawings of various objects as well as buildings.
CE306.5	Prepare the submission and working drawings of various public buildings.
CE306.6	Design furniture, utilities and services of a building
CE306.7	Write a report on planning and design of a building under consideration.

**Course Name: Theory of Structures**

CE307.1	Know the concept of determinacy and indeterminacy.
CE307.2	Apply appropriate solution techniques to the problem.

CE307.3	Analyze indeterminate structures by using different methods.
CE307.4	Interpret the output of different methods
CE307.5	Aware of the limitations of the methods of solution and their outcomes.

**Course Name: Geotechnical Engineering-II**

CE308.1	Know different soil/rock strata and use of this data for interpretation of bearing capacity
CE308.2	Understand the importance and basics of foundation engineering in the civil engineering projects.
CE308.3	Understand the classical theories of load bearing capacity and settlement of foundations
CE308.4	Understand the geotechnical aspects of shallow and deep foundations
CE308.5	Understand the concepts of the stability of slopes and study various methods of evaluating the stability of slopes
CE308.6	Understand the various concepts of modern foundation techniques.

**Course Name: Engineering Management**

CE309.1	Understand the importance of management in Construction
CE309.2	Apply the Quantitative Techniques in practice
CE309.3	Understand and apply Techniques of Material Management
CE309.4	Use the concept of Engineering Economy
CE309.5	Understand the importance of legal aspects in construction
CE309.6	know the advance techniques used in Management

**Course Name: Engineering Geology**

CE310.1	Identify and classify the different types of minerals and rocks with their civil Engineering significance.
CE310.2	Interpret the different types of geological structures with emphasis on civil engineering aspects
CE310.3	Identify the phenomenon of earthquake and landslides along with their civil engineering mitigation
CE310.4	Acquire knowledge about groundwater and building stones
CE310.5	Investigate the suitability of site for construction of dams, reservoirs, bridges and tunnels etc.
CE310.6	Identify and classify the different types of minerals and rocks with their civil Engineering significance.

**Course Name: Environmental Engineering-II**

CE311.1	Explain sources, characteristics and methods of wastewater collection.
CE311.2	Design the primary and secondary wastewater treatment units.
CE311.3	Design low cost wastewater treatment units.
CE311.4	Apply the knowhow of effluent standards for wastewater disposal as per norms.
CE311.5	Explain the necessity and importance of solid waste management.
CE311.6	Describe air pollution, its effect and controlling techniques.
CE311.7	Summarize different legal aspects related to environment protection for sustainable development.

**Course Name: Structural Design and Drawing**

CE312.1	Calculate forces acting on the Truss & its design
CE312.2	Design compression members
CE312.3	Design of steel column, column bases & its elements.
CE312.4	Calculate forces acting on the gantry girder & its design
CE312.5	Design different types of bolted & welded connections
CE312.6	Calculate forces acting on the plate girder & its design

**Course Name: Design of Concrete Structure-I**

CE401.1	Convey the concepts of structural design procedure
CE401.2	Design the individual members and hence building.

**Course Name: Quantity Survey and Valuation**

CE402.1	Able to prepare Detailed estimate of residential building
CE402.2	Able to prepare valuation reports for building of residential purpose or commercial purpose
CE402.3	Rate Analysis of civil engineering items
CE402.4	Preparation of contract document for a building

**Course Name: Earthquake Engineering**

CE403.1	Prepare mathematical modelling of structure.
CE403.2	Design earthquake resistant structure.
CE403.3	Know the concept of modern techniques.

**Course Name: Project Management & Construction Equipment's**

CE 404.1	Understand the importance of Project Management tools
CE 404.2	Plan and Schedule the Project by using CPM, PERT and MSP
CE 404.3	Understand the working of various construction equipment's.
CE 404.3	Know the importance of Safety and Risk Management in Construction

**Course Name :Optimization Techniques**

CE405.1	Learn the different techniques of optimization.
CE405.2	Different solution on queuing problem are find out
CE405.3	Learn the importance of LPP.

**Course Name: Design Of Concrete Structure-II**

CE406.1	Design of Sections subjected to torsion
CE406.2	Design of Continuous beams/ slabs
CE406.3	Design of Water tanks resting on ground
CE406.4	Design of Prestressed concrete sections

**Course Name: Water Resource Engineering II**

CE407.1	Apply the Knowledge to design the dam
CE407.2	Able to understand different types of spillway
CE407.3	Able to design CD works
CE407.4	Carry out the river training works

**Course Name: Transportation Engineering-II**

CE408.1	Able to understand importance of town planning and its past trends
CE408.2	Able to understand with a different types of urban strategies and management for sustainable urban growth
CE408.3	Decide the selection of a bridge structures; list the factors affecting, design of a various parameters of bridge structures.
CE408.4	Able to understand railway engineering design parameters and its importance.

**Course Name: Entrepreneurship**

CE409.1	Identification of Entrepreneurship
CE409.2	Able to understand small scale industry policy
CE409.3	Familiar with different industrial developing agencies
CE409.4	Able to select product for small scale industries
CE409.5	Able to prepare cash flow charts, Financial statements, and break even analysis of industry
CE409.6	Able to prepare complete project report.
CE409.7	Marketing management skill

**Course Name: Advanced Construction Techniques**

CE410.1	Familiar with modern construction material
CE410.2	Use of recent modern techniques for construction
CE410.3	Construction procedure of different civil engineering projects
CE410.4	Familiar with recent development in rehabilitation techniques for civil structures

**Course Name: Structural Design and Drawing – II**

CE411.1	Translate the ideas into workable plans
CE411.2	Classify the components
CE411.3	Design the units & hence the structure as a whole
CE411.4	Draft the details for execution
CE411.5	To read and understand the supplied drawing for execution on site.

**Course Name: Design of Bridges**

CE412.1	Understand the concept of planning, investigation, importance and classification for bridges
CE412.2	Standard specification for Road Bridges.
CE412.3	General design considerations. For R.C.C. & P.S.C. bridges.
CE412.4	Analyse and design superstructures for various types of RCC bridges
CE412.5	Analyse and design of various types of substructures and foundations
CE412.6	Different Construction Techniques
CE412.7	Different types of bridge Bearing and expansion joints