Civil
Engineering Department
Course Outcomes

Vision

To be the department of international standards that focuses on the development of entrepreneurs and domain specific professionals on the platform of technology enabled learning systems and industrial interface.

Mission

M1- To provide technical education.

M2- To prepare competitive students for employment/self-employment

M3 –To focus on developing the professional skills as well as the values

Program Educational Objectives

1. To ensure that graduates will have a mastery of fundamental knowledge, problem solving skills, engineering experimental abilities, and design capabilities necessary for entering civil engineering career and/or graduate school.
2. To incorporate verbal and written communication skills necessary for successful professional practice.
3. Demonstrate knowledge of management principles and engineering techniques for effective project management.
4. To prepare graduates to deal with ethical and professional issues, taking into account the broader societal implications of civil engineering.

Program Outcomes

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

Program Specific Outcome

PSO 1	Graduates will able to apply fundamental knowledge, problem solving skills, engineering experimental abilities, and design capabilities necessary for entering civil engineering career.
PSO 2	Graduates will be able to demonstrate knowledge of engineering techniques for effective project management and professional development to face emerging challenges.
PSO 3	Graduates will be able to apply their technical and professional skills to be nationally competitive for employment/self-employment and for the benefit of society.

SE Subjects Course Outcomes
ACADEMIC YEAR: - 2018-19
Semester – I

Subject Code	Building Technology and Materials (201001)
C201.1	Identify types of building its components and masonry.
C201.2	Explain block masonry, formwork, casting procedure of structural members.
C201.3	Elucidate various types of flooring and roofing materials.
C201.4	Describe various types of doors, windows, arches and lintels.
C201.5	Identify types of vertical circulation and protective coatings.
C201.6	Explain various materials and safety measures in construction.

Subject Code	Engineering Mathematics III (206001)
C202.1	Solve higher order linear differential equations and apply to civil Engineering problems such as bending of beams and whirling of shafts.
C202.2	Solve system of linear equations using direct and iterative numerical techniques and develop solutions to ordinary differential equations using single step and multistep methods applied to structural systems.
C202.3	Apply statistical methods like correlation, regression analysis in analyzing and interpreting experimental data and probability theory applied to construction management.
C202.4	Perform vector differentiation and use it to solve vector Identities and Direction derivatives.
C202.5	Apply Vector Integration to compute Line, surface and Volume Integrals.
C202.6	Solve various partial differential equations such as wave equation, one and two dimensional heat flow equations.

Subject Code	Surveying (201006)
C203.1	Organize the surveying works using prismatic compass and plane table.
C203.2	Explain Leveling and Contouring.
C203.3	Prepare traverse survey using theodolite.
C203.4	Prepare the topographical map using total station and surveying software.
C203.5	Propose setting out curves on field.
C203.6	Explain construction survey and SBPS system.

Subject Code	Strength of Materials (201002)
C204.1	Compute different type of stresses in determinate, indeterminate, homogeneous and composite structures.
C204.2	Compute bending stresses and shear stresses.
C204.3	Determine the torsion stresses and stresses due to strain energy for different loading conditions.
C204.4	Compute principal stresses for various loading.
C204.5	Draw Shear Force Diagram and Bending Moment Diagram for various types of beams and loading.
C204.6	Analyze axially and eccentrically loaded column, chimney and dam.

Subject Code	Geotechnical Engineering (201003)
C205.1	Determine the engineering properties of soil using laboratory tests.
C205.2	Discuss the phenomenon of soils behaviour concerned of water flow
C205.3	Analyze optimum moisture content, maximum dry density and effective stress of soil.
C205.4	State concept of shear strength and its influence on soil behaviour.
C205.5	Compute the lateral thrust due to backfill on the retaining structures.
C205.6	Classify soil slopes and their modes of failure.

SE Subjects Course Outcomes
ACADEMIC YEAR: - 2018-19
Semester – II

Subject Code	Fluid Mechanics – I (201004)
C206.1	Apply fluid properties, dimensional analysis for solving problems of fluid flow.
C206.2	Solve fluid statics problems.
C206.3	Solve fluid Kinematics problems.
C206.4	Compute fluid dynamics using Bernoulli's equation.
C206.5	Evaluate laminar flow and boundary layer theory.
C206.6	Compute turbulent flow and flow through pipes.

Subject Code	Architectural Planning and Design of Buildings (201005)
C207.1	Explain the terms of town planning and legal aspects for planning.
C207.2	Apply architectural principles of planning, building byelaws and green building features.
C207.3	Prepare architectural drawings.
C207.4	Explain various building services.
C207.5	Plan effectively types of residential buildings according to their utility.
C207.6	Plan effectively types of public buildings according to their utility.

Subject Code	Structural Analysis I (201008)
C208.1	Illustrate concept of static and kinematic indeterminacy, slope and deflection of determinate and indeterminate beams for analysis of structures.
C208.2	Analyze indeterminate beams structures and frames.
C208.3	Analyze determinate and indeterminate trusses and its application in the field.
C208.4	Analyze the structure under moving load using influence line diagrams.
C208.5	Analyze two and three hinged arches.
C208.6	Analyze the structure using plastic analysis.

Subject Code	Engineering Geology (206009)
C209.1	Explain basic concepts, common rocks, minerals, their significance and application in civil engineering.
C209.2	Recognize tectonic effects, Geological structures and their significance in Civil Engineering.
C209.3	Recall geomorphology, stratigraphy and physiographic divisions of India.
C209.4	Incorporate Geological knowledge, remote sensing and GIS techniques in design and construction.
C209.5	Determine favourable and unfavourable conditions, nature of rocks, suitability of site for construction of Building, Road, Dam, Tunnel and treatment to unfavourable rocks.
C209.6	Explain geological hazards, geo-hydrological characters of the rocks, mass wasting processes, and good building stones.

Subject Code	Concrete Technology (201007)
C210.1	Classify the cement, fly ash, aggregates and admixtures based on chemical and physical properties.
C210.2	Discuss the factors affecting properties of fresh concrete using various tests.
C210.3	Discuss properties of harden concrete with destructive and non-destructive testing instruments.
C210.4	Explain various concreting equipments and special types of concrete.
C210.5	Design concrete mix of desired grade
C210.6	Explain deteriorations in concrete and repair techniques.

Subject Code	Soft Skills (201010)
C211.1	Make use of techniques for self-awareness and self-development.
C211.2	Apply the conceptual understanding of communication into everyday practice.
C211.3	Understand the importance of teamwork and group discussions skills.
C211.4	Apply proper Leadership skills and Qualities
C211.5	Apply business etiquette skills effectively an engineer requires
C211.6	Develop time management and stress management.

TE Subjects Course Outcomes
ACADEMIC YEAR: - 2018-19
Semester – I

Subject Code	Hydrology and water resource engineering (301001)
C301.1	Compute the various parameter of hydrological cycle
C301.2	Determine the Crop water requirement
C301.3	Evaluate occurrence, distribution and movement of ground water.
C301.4	Analyze runoff and flood frequency by different methods
C301.5	Assess various parameter for reservoir planning and sedimentation
C301.6	Extend water management techniques to overcome water logging problems

Subject Code	Infrastructure Engineering and Construction Techniques (301002)
C302.1	Apply concept of infrastructure engineering in national and global development
C302.2	Recognize various components required for design of railway tracks
C302.3	Predict suitable technique for infrastructure projects
C302.4	Select suitable method of construction and type of tunnel according to nature of strata
C302.5	Identify different types of docks, harbours and its component parts
C302.6	Select appropriate construction equipment according to the activity of construction

Subject Code	Structural Design-I (301003)
C303.1	Identify various steel sections, structures and design of tension member
C303.2	Design axially loaded Compression member
C303.3	Design eccentrically loaded column and column bases
C303.4	Design laterally supported and unsupported beam
C303.5	Design connections and welded plate girder
C303.6	Design gantry girder and roof truss

Subject Code	Structural Analysis-II (301004)
C304.1	Analyze indeterminate beams and frames using slope deflection method
C304.2	Analyze indeterminate beams and frames using moment distribution method
C304.3	Analyze indeterminate beams and frames using flexibility matrix method
C304.4	Analyze indeterminate beams and frames using stiffness matrix method
C304.5	Analyze frames subjected to lateral loads as well as vertical loads and deflection of beams using approximate methods
C304.6	Explain the basic fundamentals of finite element method

Subject Code	Fluid Mechanics-II (301005)
C305.1	Compute drag and lift coefficients for different practical problems
C305.2	Apply basic governing equations for analysis and design of open channel
C305.3	Compute uniform flow in open channel for various sections and hydraulic jump
C305.4	Determine forces and work done due to impact of jet and due to impeller of centrifugal pumps.
C305.5	Design various hydraulic turbines
C305.6	Analyze gradually varied flow in open channel

Subject Code	Employability Skill Development (301006)
C306.1	Identify Employability skills required for career development.
C306.2	Develop interpersonal skills.
C306.3	Develop presentation skill
C306.4	Develop communication skill
C306.5	Apply professional etiquettes and manners in civil engineering practices.
C306.6	Use personal skills to enhance leadership and team building.

TE Subjects Course Outcome
ACADEMIC YEAR: - 2018-19
Semester - II

Subject Code	Advanced Surveying (301007)
C307.1	Explain triangulation survey and Space Based Positioning System (SBPS).
C307.2	Extend the phenomenon of hydrographic surveying.
C307.3	Explain Global Positioning System (GPS), Geographical Information System (GIS) and Remote Sensing (RS) techniques in civil engineering.
C307.4	Analyze errors across large scale survey works to make corrections.
C307.5	Explain the aerial photograph and its elements.
C307.6	Use of theodolite for trigonometric levelling and setting out of construction works.

Subject Code	Project Management and Engineering Economics (301008)
C308.1	Identify importance of management, life cycle and organizational structure for a project.
C308.2	Demonstrate use of project planning, scheduling techniques for project.
C308.3	Apply various techniques for site planning, materials and equipment management.
C308.4	Apply monitoring & controlling techniques for project.
C308.5	Get acquainted with fundamentals of economics & finance in construction project.
C308.6	Analyze feasibility of construction project using various appraisal criteria methods

Subject Code	Foundation Engineering (301009)
C309.1	Investigate surface and subsurface conditions prior to commencement of civil engineering projects.
C309.2	Determine the bearing capacity of soil.
C309.3	Analyze consolidation and settlement behaviour of soil strata.
C309.4	Explain various types of deep foundation.
C309.5	Solve the problems associated with black cotton soil.
C309.6	State soil Reinforcement and Earthquake Geo-techniques.

Subject Code	Structural Design – II (301010)
C310.1	Differentiate working and limit state method to analyze various sections.
C310.2	Design various reinforced beam sections and one-way slab
C310.3	Design two-way slabs and staircase for different support conditions.
C310.4	Design various beam sections for flexure.
C310.5	Design flexural members for shear, bond, and torsion with redistribution of moments.
C310.6	Design column and isolated footing for different loading conditions.

Subject Code	Environmental Engineering- I (301011)
C311.1	Explain the types of pollution with its control measures.
C311.2	Compute the future water quantity and quality requirements.
C311.3	Design of aeration fountain and sedimentation tank.
C311.4	Design of flocculation chamber, clari-flocculator and rapid sand gravity filters.
C311.5	Explain various modern water treatment methods.
C311.6	Apply knowledge of water distribution and rainwater harvesting system.

BE Subjects Course Outcome
ACADEMIC YEAR: - 2018-19
Semester - I

Subject Code	Environmental Engineering II (401001)
C401.1	Identify the sources, characterization and quantity of wastewater.
C401.2	Design of preliminary and primary wastewater treatment units.
C401.3	Design the secondary wastewater treatment units.
C401.4	Explain the low-cost wastewater treatment methods.
C401.5	Explain anaerobic wastewater treatment process.
C401.6	Discuss the various industrial wastewater treatment plants.

Subject Code	Transportation Engineering (401002)
C402.1	Discuss the road development, classification of road and traffic characteristics.
C402.2	Design of road geometry with drainage system.
C402.3	Design of pavements based on material properties.
C402.4	Explain air transportation system and its components.
C402.5	State bridge components and loading on bridges.
C402.6	Distinguish between types of bridge, bearings and its erection technique.

Subject Code	Structural Design and Drawing III (401003)
C403.1	Analyse the pre-stressed member under various stages with due consideration of losses.
C403.2	Design flexural elements of pre-stressed structure.
C403.3	Design RCC frames under lateral and gravity load.
C403.4	Design earth retaining structure.
C403.5	Design combined footing with various constraints.
C403.6	Design ground resting liquid storage tank.

Subject Code	Elective I (Systems Approach in Civil Engineering) (401004-(2))
C404 (2).1	Acquainted with the various optimization techniques and their use in civil engineering.
C404 (2).2	Optimize different non-linear functions with single and multiple variables.
C404 (2).3	Apply sequencing, queuing models and simulation to reduce the processing time.
C404 (2).4	Utilize dynamic programming in decision making for multivariable linear programming problems.
C404 (2).5	Analyze linear programming problems using different methods.
C404 (2).6	Optimize transportation cost and proficiently allocating scare resources to optimize and maximize the profit.

Subject Code	Elective I (Advanced Engineering Geology with Rock Mechanics) (401004-(5))
C404 (5).1	Explain the distribution, Geological characters and Civil Engineering significance of major rock formations of India.
C404 (5).2	Investigate subsurface geology to know geological set up, depth of foundation and treatment to weak zone.
C404 (5).3	Explain Geo-hydrological Characters, morphometric analysis of river basin and Geological aspects of water conservation.
C404 (5).4	Determine physical and mechanical properties of rocks and Rock Quality Designation.
C404 (5).5	Identify favourable and unfavourable field characters of rocks for tunnelling and bridge.
C404 (5).6	Apply geological knowledge in Civil Engineering planning, development and use of suitable construction material.

Subject Code	Elective II (Earthquake Engineering) (401005-(4))
C405 (4).1	Explain the basic concept of Earthquake Engineering.
C405 (4).2	Analyze problem on structural vibration.
C405 (4).3	Analyze Reinforced Concrete Structures using various seismic methods.
C405 (4).4	Design foundation considering seismic forces.
C405 (4).5	State various control system and disaster management system.
C405 (4).6	Explain various methods adopted in Strengthening and Retrofitting of structures.

BE Subjects Course Outcome
ACADEMIC YEAR: - 2018-19
Semester – II

Subject Code	Dams and Hydraulic Structures (401007)
C407.1	Classify various types of dams and its safety monitoring.
C407.2	Analyze stability of gravity dam.
C407.3	Design profile of spillway and energy dissipater.
C407.4	Analyze zoned earthen dam and diversion head works.
C407.5	Design of canal and its components.
C407.6	Explain cross drainage works and river training structures

Subject Code	Quantity Surveying, Contracts and Tenders (401008)
C408.1	Explain terms related to estimation along with preparation of approximate estimate.
C408.2	Compute the quantities to prepare the detailed estimate up to plinth level.
C408.3	Compute the quantities to prepare the detailed estimate for super structure.
C408.4	Prepare specification and rate analysis for item.
C408.5	State the tender, types of tenders, tendering procedure and methods of executing the work.
C408.6	Acquainted with contracts, types of contract and conditions of contract.

Subject Code	Elective III (Hydropower Engineering) (401009- (3))
C409 (3).1	Categorize power resources and hydropower potential.
C409 (3).2	State types of hydropower plants and their components.
C409 (3).3	Assess load for various power plants.
C409 (3).4	Design water conductor system of powerhouse.
C409 (3).5	Design different types of turbines.
C409 (3).6	Explain the economics of hydroelectric power plant.

Subject Code	Elective IV (Construction Management) (401010- (1))
C410 (1).1	Explain overview of construction sector.
C410 (1).2	Illustrate construction scheduling, work study and work measurement.
C410 (1).3	Acquaint various labour laws and financial aspects of construction projects.
C410 (1).4	Explain elements of risk management and value engineering.
C410 (1).5	State material and human resource management techniques in construction.
C410 (1).6	Discuss basics of artificial intelligence techniques in civil engineering.

Subject Code	Project (401006)
	Work in team to :-
C406.1	Identify thrust area in civil engineering and finalize problem statement.
C406.2	Review the literature to search for technical information from various resources on selected problem.
C406.3	Formulate the appropriate solution methodology.
C406.4	Apply the principles, tools and techniques to solve the problem.
C406.5	Prepare a report and presentation of project.