Department of Civil Engineering

Subject: Engineering Mathematics-III

Class:-S.E.

Subject Code: BSH 201

Course Outcome of CO's

- Students understood the basic concept of the linear differential equation of first order first degree differential equation.
- Students got the idea how to apply the linear differential equation of first order first degree differential equation to simple electrical circuits, Mechanical system, free oscillations and Damped force oscillations.
- Students understood and apply the knowledge of Fourier series to expand the periodic function in an infinite series of sine and cosine terms.
- Student understood the concept of Measures of central Tendency and Measures of Dispersion with probability distribution.
- Students understood the concept of Vector functions and apply rule of differentiation.

Students understood and apply rules of integrals to vector functions with the help of various Theorems

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Department of Civil Engineering

Subject: Engineering Mathematics-III
Class:-S.E.
Subject Code: BSH 201

Program Specific Outcome (PSO's)

- Students understood the basic concept of Linear Differential Equations with constant coefficients.
- Students got the idea of solving the Linear Differential Equations with constant coefficients by General Method
- Students understood different shortcut methods to find the particular integral.
- Students understood the solutions of Homogenous Linear differential equations by Cauchy's method.
- Students understood the solutions of Homogenous Linear differential equations by Legendre's method.
- Students got the idea of solving the Linear Differential Equations with constant coefficients by method of variation of parameters.
- Students got the idea of solving Electrical circuits & Mechanical system by using LDE.
- Students understood the idea of solving free oscillations/vibrations.
- Students understood the idea of solving Damped free oscillations/vibrations.
- Students understood the basic concept of Fourier sine and cosine transform.
- Students understood the basic concept of Fourier sine and cosine integral.
- Students got the knowledge of Measures of central Tendency and Measures of Dispersion for different type of data.
- Students got the idea of calculating the Karl Pearson's coefficient of skewness.
- Students got the idea of finding the Probability distribution for random variables by using Binomial Distributions & Normal Distributions.
- Students understood the method of evaluating the Regression and Correlation.
- Students understood the concept of Differentiation of vectors.
- Students got the knowledge of Gradient of scalar point function.
- Students understood the term Directional derivative
- Students got knowledge of Divergence of vector point function.
- Students understood the Curl of vector point function.
- Students got knowledge of Irrotational and solenoidal vector field.
- Students understood the knowledge of the line integral, surface integral &volume integral.

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Department of Civil Engineering

Subject: Engineering Mathematics-III

Class:-S.E.

Subject Code: BSH 201

Program Outcome(PO's)

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Department of Civil Engineering

Subject : Strength of Material

Class : SE

Subject Code : CED 202

Course Outcome of CO's

- Understand the concepts of stress and strain at a point as well as the stress-strain relationships for homogenous, isotropic materials.
- Determine and illustrate principal stresses, maximum shearing stress, SFD and BMD for various load on beam.
- Calculate the stresses and strains in axially-loaded members, circular torsion members & thin-wall spherical and cylindrical pressure vessels.
- Determine the deflections and rotations produced by the three fundamental types of loads: axial, torsional, and flexural.

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Department of Civil Engineering

Subject : Strength of Material

Class : SE

Subject Code : CED 202

Program Specific Outcome (PSO's)

- Students were understood properties of mechanical and construction material.
- Students got the knowledge of strength of material on engineering applications
- Students were understood stress-strain diagram of mild steel, tor steel and concrete.
- Students got the knowledge SFD and BMD
- Students were understood concept of simple bending and pure bending
- Students got the knowledge bending and shear stresses in beam
- Students were understood torsion theory and assumptions made in it.
- Students got the knowledge of strain energy concept under gradual, sudden and impact load.
- Students were understood the concept of principle plane, principal stress, normal stress.
- Students got the knowledge direct and bending stresses
- Students were understood the concept of axially loaded compression member
- Students got the knowledge of Euler's theory and Rankin's theory
- Students were understood Elastic constants and their relationship, temperature stresses.
- Students got the knowledge of Thin cylinders and Spheres subjected to internal pressure.

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Department of Civil Engineering

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Subject Code : CED 202

Program Outcome(PO's)

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Department of Civil Engineering

Subject : Fluid Mechanics-I

Class : SE

Subject Code : CED203

Course Outcome of CO's

- Students Understood properties of fluid and fluid static.
- Students got the behavior of fluid in static.
- Students understood behavior of fluid in kinematics.
- Students got fluid dynamic.
- Students got various concepts of mass, momentum and energy conservation to flows.
- Students Study analytical solutions to variety of simplified problems

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Department of Civil Engineering

Subject : Fluid Mechanics-I

Class : SE

Subject Code : CED203

Program Specific Outcome (PSO's)

- Students were understood Relevance of Fluid Mechanics, Definition of Fluid and Fluid Mechanics.
- Students got the knowledge Properties of Fluids, Dynamic and Kinematic Viscosity, Newton"s Law of Viscosity.
- Students were understood Concept of Pressure Head, Fluid Pressure at a Point, Pressure Variation in a Fluid at Rest, Pascal's Law
- Students got the knowledge Measurement of Pressure
- Students were understood Principle of Floatation and Buoyancy
- Students got the knowledge Fluid in Motion, Classification of Fluid Flow
- Students were understood Continuity Equation, Continuity Equation in Three Dimensional Flows in Cartesian Coordinates
- Students got the knowledge Viscous Flow: Relation between Shear Stress and Pressure Gradient
- Students were understood Measurement of Flow
- Students got the knowledge Classification, Discharge over Rectangular, Triangular, Trapezoidal, Stepped Notche
- Students were understood Cipolletti, Broad Crested, Narrow Crested, Ogee, Drowned Weir.
- Students got the knowledge Characteristics of Flow
- Students were understood Turbulent Flow and Flow through Pipe
- Students got the knowledge Energy Losses in Pipe Flow
- Students were understood Three Reservoir Problems Under Steady State, Flow through Siphon
- Students got the knowledge Calculation of Head Loss, Introduction to Moody's Chart

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Department of Civil Engineering

Subject : Fluid Mechanics-I

Class : SE

Subject Code : CED203

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Department of Civil Engineering

Subject : Surveying-I

Class : SE

Subject Code : CED 204

Course Outcome of CO's

- . Students got the knowledge of objective and importance of surveying.
- Students understood the compass and theodolite surveying.
- Students abled to used the plane table and adjustment of plane table.
- Students understood the leveling, contouring and trigonometric leveling.
- Students abled to measurement of area by planimeter.
- Students understood the principle and types of tachometry.

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Department of Civil Engineering

Subject : Surveying-I

Class : SE

Subject Code : CED 204

Program Specific Outcome (PSO's)

- Students understood the principles, objective, importance of surveying and units of measurements.
- Students understood the measuring tapes, types of tapes, direct and indirect ranging.
- Students understood the meridians, bearings and magnetic and true bearing, used of prismatic compass.
- Students were understood the ranging of lines, direct and indirect methods of ranging.
- Students got the knowledge of Quadrantal bearings, whole circle bearings, local attraction.
- Students understood Theodolite and types, Fundamental axes and parts of Transit theodolite, uses of theodolite, temporary adjustments of transit theodolite.
- Students understood step by step procedure for measurement of horizontal and vertical angles.
- Students understood Traverse Survey and Computations: Latitudes and departures.
- Students were understood accessories used in plane table survey, Adjustments of plane table.
- Students got the knowledge of Methods of plane table and their suitability.
- Students were understood Basic terms and definitions, Methods of leveling, Dumpy level, auto level.
- Students understood Differential leveling, profile leveling, fly leveling, check leveling, reciprocal leveling.
- Students understood Contours, Methods of contouring.
- Students were understood mid ordinate rule, trapezoidal and Simpson"s one third rule, area from co-ordinates, introduction to planimeter.
- Students understood digital planimeter. Measurement of volumes-trapezoidal and prismoidal formula.
- Students understood Basic principle, types of tacheometry.
- Students understood horizontal and inclined line of sight in fixed hair method.

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Department of Civil Engineering

Subject : Surveying-I

Class : SE

Subject Code : CED 204

Program Outcome (PO's)

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Department of Civil Engineering

Subject : Concrete Technology

Class : SE

Subject Code : CED205

Course Outcome of CO's

- Students Understood properties of ingredients of concrete
- Students got the behavior of concrete at its fresh and hardened state.
- Students understood about the concrete design mix.
- Students got special concrete and their use..
- Students got various use of Admixtures in concrete.
- Students understood about special type of concrete

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Department of Civil Engineering

Subject : Concrete Technology

Class : SE

Subject Code : CED205

Program Specific Outcome (PSO's)

- Students were understood Cement, types of cement, and tests on cement.
- Students got the knowledge Classification of aggregate
- Students were understood admixture –Modern concrete admixtures and constructions chemicals
- Students got the knowledge fresh concrete.
- Students were understood mixing- handling, placing and compaction of concrete
- Students got the knowledge Impact strength, abrasion resistance.
- Students were understood elasticity creep, shrinkage and swelling.
- Students got the knowledge Ultrasonic pulse velocity, Split Tensile test.
- Students were understood Concepts of Mix Design
- Students got the knowledge Factors affecting high strength concrete
- Students were understood concrete related equipment: batching plants, haulin
- Students got the knowledge Special concrete
- Students were understood Special concreting techniques: pumping of concrete, under water concreting
- Students got the knowledge ready mixed concrete, roller compacted concrete
- Students were understood Deterioration: Permeability and durability, chemical attack and sulphate attack by seawater
- Students got the knowledge Repairs: symptoms and diagnosis of distress
- Students were understood evaluation of cracks, selection of repair procedure
- Students got the knowledge Identify types of repairs

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Department of Civil Engineering

Subject : Concrete Technology

Class : SE

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Department of Civil Engineering

Subject : Theory of Structures - II

Class : TE

Subject Code : CED 301

Course Outcome of CO's

- Students understood analysis of Structures.
- Students were understood Concept of indeterminacy-Static and Kinematic Indeterminacy.
- Students got the knowledge of analysis of beams (simple and fixed), Analysis of single bay-single storey frames.
- Students understood Basic concept of Moment Distribution Method, Analysis of continuous beam, fixed beam by Moment Distribution Method.
- Students understood analysis of continuous beam, fixed beam, & overhang beams by Kani's Method.
- Students got the knowledge of analysis of two hinged parabolic, semicircular and circular arches

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Department of Civil Engineering

Subject : Theory of Structures - II

Class : TE

Subject Code : CED 301

Program Specific Outcome (PSO's)

- Students were understood the Material-behavior, Theory of Plastic bending and plastic hinge.
- Students got the knowledge of Plastic Hinge Concept, Shape factor.
- Students understood Static and Kinematic Indeterminacy.
- Students understood analysis of continuous beams, rectangular portal frames and trusses.
- Students got the knowledge of analysis of continuous beam, fixed beam, & overhang beams by slope deflection method.
- Students were understood the development of the column Analogy method.
- Students understood analysis of single bay-single storey frames.
- Students understood basic concept of Moment Distribution Method.
- Students understood analysis of continuous beam by Moment Distribution Method.
- Students were understood analysis of portal frames by Moment Distribution Method.
- Students were understood Analysis of continuous beam, fixed beam by Kani's Method.
- Students understood analysis of portal frames, sway and non-sway analysis by Kani's Method.
- Students understood analysis of two hinged parabolic arch.
- Students understood analysis of semicircular and circular arches
- Students understood temperature effects on two hinged arches.

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Department of Civil Engineering

Subject : Design of Structure-I

Class : TE

Subject Code : CED 302

Course Outcome of CO's

- Understand the various types of sections used in steel structures.
- Determine safety over failure of bolted and welded connections
- Design of connections, tension member, lacing/battening and welded plate girder.
- Determine the strength of flexure of flexural member and check for shear and deflection.

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Department of Civil Engineering

Subject : Design of Structure-I

Class : TE

Subject Code : CED 302

Program Specific Outcome (PSO's)

- Students were understood types of steel sections, advantages and disadvantages of steel sections.
- Students got the knowledge of steel structure and its connections (bolted and welded)
- Students were understood philosophy of of limit state design for strength and serviceability.
- Students got the knowledge of classification of cross-section i.e., plastic, compact, semi-compact, slender.
- Students were understood concept of rupture and block shear for tension member
- Students got the knowledge of designing tension member using single and double angle sections.
- Students were understood the concept of axially loaded column and built-up column.
- Students got the knowledge of designing of built-up column, lacing, battening,
- Students were understood the concept flexural member- laterally supported and unsupported beam.
- Students got the knowledge of designing welded plate girder and design of its cross-sections
- Students were understood the concept of axially loaded compression member

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Department of Civil Engineering

Subject : Design of Structure-I

Class : TE

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Department of Civil Engineering

Subject : Building Planning and Design

Class : TE

Subject Code : CED 303

Course Outcome of CO's

- Students Understood the principal of building planning
- Students got the knowledge of building bye law
- Students understood drainage and sanitary planning.
- Students got planning of residential building.
- Students got planning of public building.
- Students understood about perspective drawings.

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Department of Civil Engineering

Subject : Building Planning and Design

Class : TE

Subject Code : CED 303

Program Specific Outcome (PSO's)

- Students were understood the basic architectural composition and their elements
- Students got the knowledge principles of Building planning.
- Students were understood thermal Insulation in details
- Students got the knowledge building bye law
- Students were understood drainage & sanitation, parking spaces
- Students got the knowledge sanitary system
- Students were understood planning of residential building.
- Students got the knowledge planning of public building.
- Students were understood key point for site selection.
- Students got the knowledge maintenance, pipe sizes and gradients.
- Students were understood plan elevation section of buildings
- Students got the knowledge perspective drawing.
- Students were understood landscaping

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Department of Civil Engineering

Subject : Building Planning and Design

Class : TE

Subject Code : CED 303

Program Outcome(PO's)

1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
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Department of Civil Engineering

Subject : Engineering Geology

Class : TE

Subject Code : CED 304

Course Outcome of CO's

- Students Understood the physical geology.
- Students got the knowledge of petrology.
- Students understood structural geology.
- Students got Engineering geology.
- Students got various building stones.
- Students understood about geological structure at various site.

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Department of Civil Engineering

Subject : Engineering Geology

Class : TE

Subject Code : CED 304

Program Specific Outcome (PSO's)

- Students were understood the basic physical geological aspect.
- Students got the knowledge various mineral and properties.
- Students were understood igneous rock.
- Students got the knowledge sedimentary rocks.
- Students were understood metamorphic rocks.
- Students got the knowledge Structural geology fold, fault etc.
- Students were understood geological scale.
- Students got the knowledge ground water.
- Students were understood drilling methods.
- Students got the knowledge various building stones.
- Students were understood dam site geological features.
- Students got the knowledge tunnel site geological features.
- Students were understood land sliding.

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Department of Civil Engineering

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Department of Civil Engineering

Subject : Highway Engineering

Class : TE

Subject Code : CED 305

Course Outcome of CO's

- Students understood the importance of highways in Indian economy.
- Students got the knowledge of alignment and curves of highway.
- Students understood the different types of pavements design.
- Students got familiar with the construction material and test on materials used for highway.
- Students understood the maintenance of highway.
- Students got the knowledge of traffic engineering.

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Department of Civil Engineering

Subject : Highway Engineering

Class : TE

Subject Code : CED 305

Program Specific Outcome (PSO's)

- Students were understood the twenty year plans of highway and Indian road committee.
- Students understood importance and economic analysis of highway.
- Students understood the classification of road and significance of highway planning.
- Students understood national development project and Pradhan Mantri Gram Sadak Yojna.
- Students understood engineering survey for highway alignment, conventional and modern methods.
- Students got the knowledge of typical cross-section elements of highway.
- Students were understood Vertical curves horizontal curves transition curves, super-elevation, widening at curves.
- Students understood cross-section elements of hilly roads, hair-pin bends.
- Students understood Pavement components and their role.
- Students got the knowledge of IRC method (IRC.37) of Flexible Pavements design.
- Students got the knowledge of IRC method (IRC.58) of Rigid Pavements design.
- Students understood Highway construction materials, their properties and testing methods.
- Students understood construction machineries, modern material- plastic, geo-fiber, geo-textile.
- Students understood pavement management system.
- Students understood present serviceability index, skid resistance.
- Students understood Road user characteristics.
- Students understood studies - volume study speed study, parking study, accident study.
- Students understood the Intersection - types, layouts, design& controls.

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Department of Civil Engineering

Subject : Highway Engineering

Class : TE

Subject Code : CED 305

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Department of Civil Engineering

Subject : Environmental Engineering

Class : BE

Subject Code : CED 401

Course Outcome of CO's

- Understand the concepts of water demand, sources of water and water treatment
- Determine population forecasting with respect to water demand and design period.
- Design storm, sanitary sewer system and treatment units.
- Analyze water quality parameter with standards.
- Understand the concept of solid waste management collection of solid waste to disposal and recycling.

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Department of Civil Engineering

Subject : Environmental Engineering

Class : BE

Subject Code : CED 401

Program Specific Outcome (PSO's)

- Students were understood the concepts of water demand and factors affecting on it.
- Students got the knowledge of water quality standards
- Students were understood the concept of treatment of water in water treatment plant.
- Students got the knowledge of water treatment units- intake structure, sedimentation tank etc.
- Students were understood concept of waste water collection system
- Students got the knowledge of sewage treatment units and its design
- Students were understood the physical, chemical and biological characteristics of sewage
- Students were understood the concept of solid waste management system.
- Students got the knowledge of properties of municipal solid waste.
- Students were understood the ways of working on solid waste from its collection to disposal
- Students got the knowledge of recycling the solid waste

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Department of Civil Engineering

Subject : Environmental Engineering

Class : BE

Subject Code : CED 401

Program Outcome(PO's)

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Department of Civil Engineering

Subject : Water Resources Engineering-II

Class : BE

Subject Code : CED 402

Course Outcome of CO's

- Understand the concepts of mass curve and types of dams with its use, canal falls, head and cross regulator
- Determine storage capacity of reservoir, forces acting on gravity dam, suitability of cross-drainage works, earthen dam.
- Design low and high gravity dam, canal design by using Kennedy's and Lacey's theory, and design criteria for weir and Barrage
- Analyze the stability of gravity dam.

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Department of Civil Engineering

Subject : Water Resources Engineering-II

Class : BE

Subject Code : CED 402

Program Specific Outcome (PSO's)

- Students were understood the concepts of reservoir for mass curve.
- Students got the knowledge of types of dams and reservoir.
- Students were understood the concept of canal falls, head and cross regulator
- Students got the knowledge of canal design by Kennedy's and Lacey's theory.
- Students were understood concept of mass curve to determine reservoir capacity
- Students got the knowledge failure of gravity dam, earthen dam
- Students were understood stability analysis of gravity and earthen dam
- Students got the knowledge of spillway, spillway gates, its design criteria.
- Students were understood the concept head and cross regulator
- Students got the knowledge of Cross Drainage Works, weir and barrage
- Students were understood the concept of ways of energy dissipation.
- Students got the knowledge of forces acting and design methods of arch dams.
- Students were understood about under sluices, divide walls

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Department of Civil Engineering

Subject : Water Resources Engineering-II

Class : BE

Subject Code : CED 402

Program Outcome(PO's)

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Department of Civil Engineering

Subject : Design of Structures - III

Class : BE

Subject Code : CED 403

Course Outcome of CO's

- Students understood the design process of footing, Rectangular and Trapezoidal footing.
- Students got the knowledge of component of flat slab and design methods.
- Students abled to design the retaining wall.
- Students understood the design of water tank.
- Students understood the prestressed concrete , need of high strength concrete.
- Students abled to design circular slab.

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Department of Civil Engineering

Subject : Design of Structures - III

Class : BE

Subject Code : CED 403

Program Specific Outcome (PSO's)

- Students understood the types of combined footing, design steps of footing.
- Students understood the design steps of trapezoidal footing.
- Students understood the component of flat slab construction.
- Students understood the methods of flat slab design, direct design method and equivalent frame method.
- Students understood the design steps of cantilever retaining wall.
- Students understood the design of counter fort retaining wall.
- Students understood solid shaft, columns and braced frame regarding design of staging.
- Students understood the design of under ground water tank.
- Students understood principles of prestressing, basic concepts and comparison between prestressed and reinforced concrete.
- Students understood the need of high strength concrete and steel for prestressed concrete construction.
- Students understood the design process of circular slab of fully restrained and simply supported.
- Students understood the concepts of loads on formwork, design of shuttering for columns, beams and slab floor.

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Department of Civil Engineering

Subject : Design of Structures - III

Class : BE

Subject Code : CED 403

Program Outcome(PO's)

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Department of Civil Engineering

Subject : Foundation Engineering

Class : BE

Subject Code : CED 404

Course Outcome of CO's

- Students Understood Investigation of soil properties.
- Students got the analysis of different method of bearing capacity of soil
- Students understood design shallow foundation
- Students got design deep foundation.
- Students got various type and design of well and caisson
- Students understood study and design of coffer dam.

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Department of Civil Engineering

Subject : Foundation Engineering

Class : BE

Subject Code : CED 404

Program Specific Outcome (PSO's)

- Students were understood the investigation methodologies
- Students got the knowledge sampling techniques
- Students were understood Failure mechanism in shallow and deep foundation
- Students got the knowledge terzaghi's theory and generalized bearing capacity equation
- Students were understood bearing capacity from filed tests Plate load test, Standard Penetration Test (SPT)
- Students got the knowledge stress distribution, Immediate and Consolidation settlement
- Students were understood proportioning of footings, combined footing design
- Students got the knowledge raft Foundation: Design consideration
- Students were understood Its types, use and function, timber piles, precast piles, in-situ piles
- Students got the knowledge pile driving on ground, selection of pile type
- Students were understood design load, scour depth, sinking and frictional resistance for well tilting
- Students got the knowledge Caisson safety problems, caisson disease, working, uses Salient construction features.
- Students were understood Foundation problems and techniques on B.C. soil
- Students got the knowledge double wall and cellular cofferdam
- Students were understood design of circular and diaphragm type cofferdam Pumping
- Students got the knowledge sealing of bottom of cofferdam

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Department of Civil Engineering

Subject : EL-II Prestressed Concrete

Class : BE

Subject Code : CED 441

Course Outcome of CO's

- Understand the concepts basic concept of prestressing and methods, material required for it.
- Determine Patterns of failures of the section in flexure and shear of prestressing.
- Design prestressed concrete section, pipes and anchor block by Guyon's.
- Analyze flexural and shear strength of prestressed concrete section.
- Understand the concepts of circular prestressing and different cable profiles, pressure line, thrust line, kern point and its importance.

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Department of Civil Engineering

Subject : EL-II Prestressed Concrete

Class : BE

Subject Code : CED 441

Program Specific Outcome (PSO's)

- Students were understood the basic concept of prestressing and methods, material required for it.
- Students got the knowledge of patterns of failures of the section in flexure and shear of prestressing.
- Students were understood the concept of of circular prestressing and different cable profiles, pressure line, thrust line, kern point and its importance.
- Students got the knowledge of design prestressed concrete section, pipes and anchor block by Guyon's.
- Students were understood concept of analyzing flexural and shear strength of prestressed concrete section.
- Students got the knowledge of need of anchor blocks for prestressed concrete section
- Students were understood analysis of Composite prestressed concrete section
- Students got the knowledge of concept of circular prestressing and types of prestressed concrete pipes.
- Students were understood the concept of methods and systems of prestressing
- Students got the knowledge of design of one way and two-way slab
- Students were understood the concept of Losses in prestressing
- Students got the knowledge of symmetrical and unsymmetrical flanged sections
- Students were understood about anchor block by Guyon's, Magnel's and Indian Standard Code method

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Department of Civil Engineering

Subject: Engineering Mathematics-IV

Class:-S.E.

Subject Code: BSH 251

Course Outcome of CO's

- Students understood and apply the Laplace theory to get the transform of different functions
- Students understood and apply Inverse Laplace Theory to solve linear differential equations with constant.
- Students understood the concept of z transform & inverse Z transform of elementary functions.
- Students understood how to solve different numerical problems base on given data.
- Students got the idea of complex differentiation.
- Students understood complex integral calculus.

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Department of Civil Engineering

Subject: Engineering Mathematics-IV

Class:-S.E.

Subject Code: BSH 251

Program Specific Outcome (PSO's)

- Students understood the basic Properties & theorems of Laplace transforms.
- Students got the idea of the transforms of periodic function & Heaviside unit step function.
- Students understood difference between Laplace transform of displaced unit step function & Dirac delta function.
- Students got the idea of how to find the Inverse Laplace transforms by using various methods.
- Students understood and apply inverse Laplace transform to solve linear differential equations.
- Students got idea to solve Simultaneous Linear differential equations by inverse Laplace transform.
- Students understood the concept of Formation of partial differential equation by eliminating arbitrary constant and function.
- Students understood the concept of Linear equations of first order (Lagranges's linear equation).
- Students got knowledge of solutions of Non-linear equation of first order.
- Students understood how to solve D.E. by Charpits Methods.
- Students got knowledge of method of separation of variable.
- Students understood one dimensional heat flow equation.
- Students got knowledge of two dimensional heat equations.
- Students understood the knowledge of shared memory.
- Students understood Newton Raphson method to Solve transcendental equations.
- Students understood and apply Gauss Seidel method to solve simultaneous linear equations
- Students understood and apply Numerical differentiation with Newton's forward and Newton's backward difference formulae.
- Students understood and apply Eular modified Method to solve ordinary differential equation by
- Students understood and apply Runge-Kutta IVth order method
- Students understood and apply Principle of least squares for different Curve fitting.
- Students understood the concept of Analytic function and Cauchy Riemann equations in Cartesian form
- Students understood the concept of Harmonic function and expand Laurent's series
- Students got the idea of Conformal mapping
- Students got knowledge of Line integral
- Students understood and apply Cauchy's integral formula Residues
- Students understood and apply Cauchy's residue theorem

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Department of Civil Engineering

Subject: Engineering Mathematics-IV
Class:-S.E.
Subject Code: BSH 251

Program Outcome(PO's)

1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
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Department of Civil Engineering

Subject : Building Construction and Drawing

Class : SE

Subject Code : CED 253

Course Outcome of CO's

- Know various technical terms related to different components of building structure
- Understand principles of planning considering built environment approach
- Understand the preparation of line plans for Residential and Public Buildings.
- Draw submission drawing and working drawing
- Understand and Know various materials required for execution of various construction processes

Students are able to understand construction procedure of different components

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Department of Civil Engineering

Subject : Building Construction and Drawing

Class : SE

Subject Code : CED 253

Program Specific Outcome (PSO's)

- Students were understood the different type of structure.
- Students got the knowledge principles of Building planning.
- Students were understood different building component.
- Students got the knowledge building bye law
- Students were understood different type of foundation.
- Students got the knowledge building joints.
- Students were understood planning of residential building.
- Students got the knowledge planning of public building.
- Students were understood building materials.
- Students got the knowledge repair and maintenance work.
- Students were understood plan elevation section of buildings
- Students got the knowledge stair case.
- Students were understood landscaping

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Department of Civil Engineering

Subject : Building Construction and Drawing

Class : SE

Subject Code : CED 253

Program Outcome(PO's)

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Department of Civil Engineering

Subject : Fluid Mechanics-II

Class : SE

Subject Code : CED 254

Course Outcome of CO's

- Students were able to apply their knowledge of fluid mechanics in addressing problems in open channels.
- They possessed the skills to solve problems in uniform, gradually and rapidly varied flows in steady conditions.
- 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.
- Impact of Jet on vanes which is a base for analysis and design of turbo machines.
- They will have knowledge in hydraulic machines(pumps and turbines)
- Student were able to understand Dimensional Analysis

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Department of Civil Engineering

Subject : Fluid Mechanics-II

Class : SE

Subject Code : CED 254

Program Specific Outcome (PSO's)

- Students were understood introduction to open channel, classification of channels.
- Students got the knowledge gradually and rapidly varied flows, velocity distribution in open channels
- Students were understood uniform flow in open channel
- Students got the knowledge depth-energy relationships in open channel
- Students were understood gradually varied flow
- Students got the knowledge hydraulic jump, hydraulic jump as energy dissipater
- Students were understood concept of boundary layer
- Students got the knowledge forces on immersed bodies in flowing fluids, general equations, lift, drag, aerofoil, magnus effect
- Students were understood dynamics of force, momentum, impulse momentum equation.
- Students got the knowledge classification of turbines, impulse and reaction turbines, components and their functions
- Students were understood series of flat and curved vanes mounted on wheel, jet propulsion
- Students got the knowledge selection criterion for turbines, cavitations, draft tube, runway speed, surge tank
- Students were understood centrifugal pumps
- Students were understood reciprocating pumps
- Students got the knowledge dimensional analysis

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Department of Civil Engineering

Subject : Fluid Mechanics-II

Class : SE

Subject Code : CED 254

Program Outcome(PO's)

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Department of Civil Engineering

Subject : Surveying-II

Class : SE

Subject Code : CED 255

Course Outcome of CO's

- Students understood the importance of necessity and types of curves.
- Students got the knowledge of geodetic surveying and Classification of triangulation system.
- Students understood the topographical surveys.
- Students got familiar with the uses of aerial photographs.
- Students understood Geographical Information System.
- Students got the knowledge of Modern Surveying Instruments.

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Department of Civil Engineering

Subject : Surveying-II

Class : SE

Subject Code : CED 255

Program Specific Outcome (PSO's)

- Students were understood the necessity and types of curves.
- Students understood setting out curves by Rankine's deflection angle method.
- Students understood the principle and classification of triangulation system.
- Students understood types of errors and to the field observations.
- Students understood setting out work building, culverts, bridges and tunnels.
- Students got the knowledge of city surveying and topographical surveys.
- Students were understood uses of aerial photographs.
- Students understood procedure of aerial survey.
- Students understood general idea of terrestrial photogrammetry and aerial photogrammetry.
- Students got the knowledge of Principles of energy interaction in atmosphere and earth surface features.
- Students got the knowledge of global positioning system.
- Students understood key components of GIS and functions of GIS.
- Students understood integration of Remote sensing and GIS.
- Students understood working and operating principle of Total station.
- Students understood set up of total Station.

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Department of Civil Engineering

Subject : Surveying-II

Class : SE

Subject Code : CED 255

Program Outcome (PO's)

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Department of Civil Engineering

Subject : Theory of Structure - I

Class : SE

Subject Code : CED 256

Course Outcome of CO's

- Student was able understand riveted and welded connection
- Student was able understand curvature, slope and deflection
- Student was able to analyze fixed beams.
- Student was able to analyze continuous beams
- Student was able to analyze moving loads and will be able to draw influence line diagrams for simply supported beams.
- Student will also be able to analyze three hinge arches and three hinge suspension bridges.

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Department of Civil Engineering

Subject : Theory of Structure - I

Class : SE

Subject Code : CED 256

Program Specific Outcome (PSO's)

- Students were understood Riveted and Welded connection
- Students got the knowledge design of riveted joints, for axially loaded member, design of fillet weld and butt weld
- Students were understood Eccentric connections
- Students got the knowledge Curvature, slope and deflection
- Students were understood moment area method and conjugate beam method.
- Students got the knowledge Deflection of statically determinate structure
- Students were understood deflection of pin jointed trusses
- Students got the knowledge Relation between free bending moment diagram and Fixed bending moment diagram
- Students were understood Beams with different moment of Inertia, effect of sinking of support
- Students got the knowledge Calpeyroms theorem of three moments, beam with diff MI, effect of sinking of support
- Students were understood Rolling loads and Influence lines for statically determinate structure
- Students got the knowledge Criteria for maximum bending moments and maximum shearing force for simple determinate beams.
- Students were understood Three hinged Arches
- Students were understood Three hinged suspension bridge

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Department of Civil Engineering

Subject : Theory of Structure - I

Class : SE

Subject Code : CED 256

Program Outcome(PO's)

1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
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Department of Civil Engineering

Subject : Design of Structures-II (RCC)

Class : TE

Subject Code : CED 306

Course Outcome of CO's

- Students will know to analyze different components of RCC Structure using IS Code
- Students understood the various methods of design of RCC Structure
- Students got the knowledge of various loading consider in analysis of slab, beam, column and footing
- Students will be able to design different types of RCC components reinforced.
- Students will be able to design new types of RCC structures

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Department of Civil Engineering

Subject : Design of Structures-II (RCC)

Class : TE

Subject Code : CED 306

Program Specific Outcome (PSO's)

- Students were understood the to analyze different components of RCC Structure using IS Code
- Students got the knowledge of various loading consider in analysis of slab, beam, column and footing
- Students were understood the various methods of design of RCC Structure
- Students got the knowledge to design different types of RCC components reinforced.
- Students were understood the use of IS Code to analyze structure
- Students got the knowledge to design new types of RCC structures
- Students were understood the methods of design LSM & WSM
- Students got the knowledge of analysis of different sections of beam
- Students were understood the design of different sections of beam
- Students got the knowledge of analysis and design of different types of slabs
- Students were understood the design of staircase
- Students got the knowledge of design of column – long and short

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Department of Civil Engineering

Subject : Design of Structures-II (RCC)

Class : TE

Subject Code : CED 306

Program Outcome(PO's)

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Department of Civil Engineering

Subject : Professional Practices

Class : TE

Subject Code : CED 307

Course Outcome of CO's

- Students understood the estimates for buildings.
- Students got the knowledge of detailed estimates of building parts.
- Students understood the detailed specification .
- Students got familiar with various conditions and categories of contract.
- Students understood the tenders.
- Students got the knowledge of valuation.

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Department of Civil Engineering

Subject : Professional Practices

Class : TE

Subject Code : CED 307

Program Specific Outcome (PSO's)

- Students were understood units of measurements.
- Students understood methods of preparing approximate estimates for buildings.
- Students understood the methods of preparing approximate estimates for roads,bridges.
- Students understood rules of measurements.
- Students understood the detailed estimates for slab, tank, RCC well.
- Students got the knowledge of classification of specifications.
- Students were understood rate analysis.
- Students understood purpose of rate analysis, batching.
- Students understood general idea of contracts and various conditions.
- Students got the knowledge of responsibility of owner and contractor.
- Students got the knowledge of types of contracts.
- Students understood preparation and submission of tenders.
- Students understood acceptance of tender.
- Students understood govt. procedure for work execution.
- Students understood deals of property.

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Department of Civil Engineering

Subject : Professional Practices

Class : TE

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Department of Civil Engineering

Subject : Geotechnical Engineering

Class : TE

Subject Code : CED 308

Course Outcome of CO's

- Understand Characterize and classify soils.
- Identify shear strength parameters for field conditions.
- Compute and analyze the consolidation settlements.
- Understand the principles of compaction and its control.
- Understand the shear strength on soil
- Knowledge of Earth pressure, and slope stability.

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Department of Civil Engineering

Subject: Geotechnical Engineering

Class: TE

Subject Code: CED 308

Program Specific Outcome (PSO's)

- Students were understood the origin of soil, scope of geotechnical engineering
- Students got the knowledge property of soil
- Students were understood consistency limits soil texture and structure.
- Students got the knowledge particle size classification
- Students were understood seepage of water through soil , permeability
- Students got the knowledge graphical methods of flow net construction and its application to isotropic soil only.
- Students were understood stress distribution in soil
- Students got the knowledge newmark's method for uniformly distributed loads
- Students were understood proctor density and optimum moisture content, factor affecting compaction,
- Students got the knowledge terzaghi's theory of one dimensional consolidation , degree of consolidation, determination of coefficient of consolidation,
- Students were understood concept of shear strength
- Students got the knowledge determination of shear strength by direct, unconfined shear test
- Students were understood earth pressure at rest active and passive condition,
- students got the knowledge classification of slope failures, infinite and finite slope.
- Students were understood elementary idea about rankin's earth pressure(for cohesive and cohesion less)
- Students got the knowledge taylor's stability number and stability curve.

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Department of Civil Engineering

Subject : Water Resources Engineering -I

Class : TE

Subject Code : CED 309

Course Outcome of CO's

- Students were understanding about different components of the hydrological cycle
- Enable the students to estimate runoff, infiltration, evaporation, ground water.
- Students understood stream gauging flow and peak floods
- Students were study ground water hydrology.
- Students were study estimation of irrigation water requirement
- Students were understanding concepts of drought management.

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Department of Civil Engineering

Subject : Water Resources Engineering -I

Class : TE

Subject Code : CED 309

Program Specific Outcome (PSO's)

- Students were understood the hydrological cycle.
- Students got the knowledge estimation of rainfall, mass curves.
- Students were understood precipitation, evaporation.
- Students got the knowledge of infiltration and its types.
- Students were understood runoff and its types.
- Students got the knowledge unit hydrograph.
- Students were understood stream gauging and its methods.
- Students got the knowledge flood and measurement methods.
- Students were understood ground hydrology.
- Students got the knowledge permeability and hydraulic well.
- Students were understood of irrigation method.
- Students got the knowledge crop water concepts.
- Students were understood watershed management.
- Students got the knowledge water logging and drainage.

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Department of Civil Engineering

Subject : Water Resources Engineering -I

Class : TE

Subject Code : CED 309

Program Outcome(PO's)

1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
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10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
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Department of Civil Engineering

Subject : EL- Environmental Impact Assessment

Class : TE

Subject Code : CED 310

Course Outcome of CO's

- Understand the concept of environmental impact assessment- its capability and limitations
- Assessment of environmental impact on land, water, air etc.
- Preparing plan for mitigation of adverse impact on environment.
- Assessment of Environmental impact on sustainable development.
- Understand the concept of environmental audit- partial audit, compliance audit, methodologies and regulations

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Department of Civil Engineering

Subject : EL- Environmental Impact Assessment

Class : TE

Subject Code : CED 310

Program Specific Outcome (PSO's)

- Students were understood the concepts of environmental impact assessment- its capability and limitations
- Students got the knowledge of assessment of environmental impact on land, water, air etc.
- Students were understood the concept of environmental audit- partial audit, compliance audit, methodologies and regulations
- Students got the knowledge of preparing plan for mitigation of adverse impact on environment.
- Students were understood concept of assessment of Environmental impact on sustainable development
- Students got the knowledge of environmental management and environmental impact
- Students were understood the methodologies of environmental impact assessment.
- Students were understood the concept of sustainable development
- Students got the knowledge of planning for mitigation of adverse impact on environment
- Students were understood the case studies of EIA for infrastructure project
- Students got the knowledge of legal provisions, stages and types of EIA.

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Department of Civil Engineering

Subject : EL- Environmental Impact Assessment

Class : TE

Subject Code : CED 310

Program Outcome(PO's)

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Department of Civil Engineering

Subject : Structural Mechanics

Class : BE

Subject Code : CED 451

Course Outcome of CO's

- Students understood the theory of elasticity.
- Students got the knowledge of thin and thick plate theory.
- Students understood the flexibility matrix method.
- Students got familiar with stiffness matrix method.
- Students understood procedure of finite element method.
- Students got the knowledge of shells theory.

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Department of Civil Engineering

Subject : Structural Mechanics

Class : BE

Subject Code : CED 451

Program Specific Outcome (PSO's)

- Students were understood strain displacement relation.
- Students understood compatibility equation and plane.
- Students understood the Kirchhoff's thin plate theory.
- Students understood navier's solution of plate.
- Students understood the flexibility matrix method.
- Students got the knowledge of flexibility coefficient.
- Students were understood application of stiffness matrix method.
- Students understood stiffness matrix method.
- Students understood general idea of finite element method.
- Students got the knowledge of application of finite element method in civil engineering.
- Students got the knowledge of 1-D, 2-D elements.
- Students understood analysis of truss beam.
- Students understood the theory of cylindrical shells.
- Students understood theory of conical shells.

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Department of Civil Engineering

Subject : Structural Mechanics

Class : BE

Subject Code : CED 451

Program Outcome (PO's)

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Department of Civil Engineering

Subject : Construction Management

Class : BE

Subject Code : CED 452

Course Outcome of CO's

- Students understood the construction project cost estimates & create construction project schedules.
- Students got the knowledge of construction network techniques
- Students understood & analyze professional decisions based on ethical principles.
- Students got the knowledge of project construction to be done within time and with optimized cost
- Students understood construction project safety with proper communication.

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Department of Civil Engineering

Subject : Construction Management

Class : BE

Subject Code : CED 452

Program Specific Outcome (PSO's)

- Students were understood the construction management project goals.
- Students got the knowledge of project manager's job, responsibilities and rights and total quality management.
- Students were understood project management phases from its identification to actual evaluation.
- Students got the knowledge of construction equipment and its use on different sites.
- Students were understood construction project planning & scheduling with bar charts.
- Students got the knowledge of construction project network techniques CPM & PERT for cost management and proper scheduling.
- Students were understood the construction work with safety and the tools used for it.
- Students got the knowledge of the types of organizational communication for its effectiveness to work smoothly
- Students were understood importance of human resources in construction organization.
- Students got the knowledge of material management and its analysis for construction work

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Department of Civil Engineering

Subject : Construction Management

Class : BE

Subject Code : CED 452

Program Outcome(PO's)

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Department of Civil Engineering

Subject : Transportation Engineering

Class : BE

Subject Code : CED 453

Course Outcome of CO's

- Functions of components of railway track
- Apply existing technology to the design, construction, and maintenance of railway physical facilities.
- Design & study of Harbor Engineering.
- Understanding and study of Tunnel Engineering.
- Aware of the current international technology relative to Airport Engineering
- Develop an awareness of major issues and problems of current interest to the Airport Engineering.

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Department of Civil Engineering

Subject : Transportation Engineering

Class : BE

Subject Code : CED 453

Program Specific Outcome (PSO's)

- Students were understood introduction, significance of road, rail, air and water transports
- Students got the knowledge railway engineering and planning.
- Students were understood elements of permanent way rails, sleepers, fixtures and fastenings.
- Students got the knowledge route alignment surveys, conventional and modern methods
- Students were understood gradient, super elevation
- Students got the knowledge earthwork – stabilization of track on poor soil
- Students were understood construction and maintenance of tracks students got the knowledge
- Students were understood railway stations and yards and passenger amenities
- Students got the knowledge definition of basic terms: planning harbours
- Students were understood design principles – harbour layout and terminal facilities, coastal structures, inland water transport
- Students got the knowledge tunneling: introduction, size and shape of the tunnel
- Students were understood air transport characteristics
- Students got the knowledge airport classification,planning
- Students were understood airport design, runway design: orientation
- Students got the knowledge wind rose diagram, airport services

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Department of Civil Engineering

Subject : Transportation Engineering

Class : BE

Subject Code : CED 453

Program Outcome(PO's)

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Department of Civil Engineering

Subject : EL-III Structural Dynamics and Earthquake Engineering

Class : BE

Subject Code : CED 493

Course Outcome of CO's

- Understand the concepts of causes of earthquake and its basic terminologies.
- Determine response to general dynamic loading, Duhamel's integral.
- Design of earthquake resistant and understand the concept of seismic design with use of design codes.
- Analyze lateral force and seismic slope stability regarding earthquake
- Understand the concept of theory of vibrations related to earthquake

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Department of Civil Engineering

Subject : EL-III Structural Dynamics and Earthquake Engineering

Class : BE

Subject Code : CED 493

Program Specific Outcome (PSO's)

- Students were understood the concepts of causes of earthquake and its basic terminologies.
- Students got the knowledge of vibration theory- damped, undamped vibration.
- Students were understood the concept of ground motion and effect of ground conditions.
- Students got the knowledge of response to dynamic loading and design based on it.
- Students were understood concept of soil response to earthquake- liquefaction, landslides etc
- Students got the knowledge of use of design codes for buildings, seismic design of masonry structures
- Students were understood the concepts of causes of earthquake and its basic terminologies.
- Students were understood the concept of determining response to general dynamic loading, Duhamel's integral.
- Students got the knowledge of design of earthquake resistant and understand the concept of seismic design with use of design codes.
- Students were understood the analysis of lateral force and seismic slope stability regarding earthquake
- Students got the knowledge of theory of vibrations related to earthquake

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Department of Civil Engineering

Subject : EL-III Structural Dynamics and Earthquake Engineering

Class : BE

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