



# ESWAR COLLEGE OF ENGINEERING

(Approved by AICTE, & Affiliated to JNTUK, A.P.)

KESANUPALLI (V), NARASARAOPETA-522549, AP

www.eswarcollegeofengg.org, email:eswarcollegeofengg@gmail.com

## DEPARTMENT OF CIVIL ENGINEERING

### Course Outcomes

Year/Sem: II B.Tech I SEM

A.Y:2022-2023

<b>Course Name: Mathematics –III</b>	
<b>Course Code: CE2101</b>	
<b>CE2101.1</b>	Determine the physical meaning of different operators such as gradient, curl and divergence
<b>CE2101.2</b>	Estimate the work done against a field, circulation and flux using vector calculus
<b>CE2101.3</b>	Apply the Laplace transform for solving differential equations
<b>CE2101.4</b>	Compute the Fourier series of periodic signals
<b>CE2101.5</b>	know and be able to apply integral expressions for the forwards and inverse Fourier transform to a range of non-periodic waveforms
<b>CE2101.6</b>	Identify solution methods for partial differential equations that model physical processes

<b>Course Name: Strength of materials-I</b>	
<b>Course Code: CE2102</b>	
<b>CE2102.1</b>	Understand the basic materials behaviour under the influence of different external loading conditions and the support conditions
<b>CE2102.2</b>	Able to draw the diagrams indicating the variation of the key performance features like bending moment and shear forces
<b>CE2102.3</b>	Knowledge of bending concepts and calculation of section modulus
<b>CE2102.4</b>	Determination of stresses developed in the beams and deflections due to various loading conditions
<b>CE2102.5</b>	To classify cylinders based on their thickness and to derive equations for measurement of stresses across the cross section when subjected to external pressure
<b>CE2102.6</b>	Analysis stresses across section of the thin and thick cylinders to arrive at optimum sections to withstand the internal pressure using Lamé's equation

<b>Course Name: Fluid Mechanics</b>	
<b>Course Code: CE2103</b>	
<b>CE2103.1</b>	Understand the various properties of fluids and their influence on fluid motion and analyse a variety of problems in fluid statics and dynamics
<b>CE2103.2</b>	Calculate the forces that act on submerged planes and curves
<b>CE2103.3</b>	Ability to analyse various types of fluid flows
<b>CE2103.4</b>	Apply the integral forms of the three fundamental laws of fluid mechanics to turbulent and laminar flow through pipes and ducts
<b>CE2103.5</b>	Determination of order to predict relevant pressures, velocities and forces



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CE2103.6	Able Measure the quantities of fluid flowing in pipes, tanks and channels
<b>Course Name: Surveying and Geometrics</b>	
<b>Course Code: CE2104</b>	
CE2104.1	To Apply the knowledge to calculate angles, distances and levels
CE2104.2	Identify data collection methods and prepare field notes
CE2104.3	Understand the working principles of survey instruments, measurement errors and corrective measures
CE2104.4	Determination of survey data and compute areas and volumes, levels by different type of equipment
CE2104.5	Apply the surveying principles to determine areas and volumes and setting out curves
CE2104.6	Able to Identification of source of errors and rectification methods

<b>Course Name: Highway Engineering</b>	
<b>Course Code: CE2105</b>	
CE2105.1	Able to draw a Plan highway network for a given area
CE2105.2	To Determine Highway alignment
CE2105.3	Design Intersections and prepare traffic management plans
CE2105.4	Judge suitability of pavement materials and design flexible and rigid pavements
CE2105.5	To classify the different concepts in the field of Highway Engineering
CE2105.6	Able to know the types and classification of roads and intersections

<b>Course Name: Concrete Technology Lab</b>	
<b>Course Code: CE2106</b>	
CE2106.1	Able to Determine the consistency and fineness of cement
CE2106.2	To understand the initial and final setting time of cement
CE2106.3	To know the knowledge about the specific gravity and soundness of cement
CE2106.4	To Determine the workability of cement concrete by compaction factor
CE2106.5	Applying the rebound hammer to know the non-destructive test of concrete
CE2106.6	Analyse flakiness and elongation index of aggregates

<b>Course Name: Highway Engineering lab</b>	
<b>Course Code: CE2107</b>	
CE2107.1	Able to Test aggregates and judge the suitability of materials for the road construction
CE2107.2	Analyse the optimum bitumen content for Bituminous Concrete
CE2107.3	To Determine the traffic volume, speed and parking characteristics
CE2107.4	Able to Draw the highway cross sections and intersections
CE2107.5	To differentiate the carry out surveys for traffic volume, speed and parking
CE2107.6	Understand to the stability for the given bituminous mix



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<b>Course Name: Surveying field work –I Lab</b>	
<b>Course Code: CE2108</b>	
<b>CE2108.1</b>	To understand the various types of surveying methods
<b>CE2108.2</b>	Determination of the areas by applying the chain surveying
<b>CE2108.3</b>	Analyse the area calculations by triangulations methods
<b>CE2108.4</b>	Finding the area boundaries by plane table survey
<b>CE2108.5</b>	Determination of distance between two inaccessible points by using compass
<b>CE2108.6</b>	To understand the Height of the instrument method



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## Year/Sem: II B.Tech II SEM

<b>Course Name: Complex Variables and Statistical Methods</b>	
<b>Course Code: CE2201</b>	
<b>CE2201.1</b>	To apply Cauchy-Riemann equations to complex functions in order to determine whether a given continuous function is analytic
<b>CE2201.2</b>	Able to know the differentiation and integration of complex functions used in engineering problems
<b>CE2201.3</b>	Understand the Cauchy residue theorem to evaluate certain integrals
<b>CE2201.4</b>	Apply discrete and continuous probability distributions
<b>CE2201.5</b>	Knowledge to design the components of a classical hypothesis test
<b>CE2201.6</b>	Differentiate the infer the statistical inferential methods based on small and large sampling tests

<b>Course Name: Strength of materials -II</b>	
<b>Course Code: CE2202</b>	
<b>CE2202.1</b>	Determination of Principal stresses and strains developed in cross section of the beams
<b>CE2202.2</b>	Understand the concepts of torsion and governing torsion equation, and there by calculate the power transmitted by shafts and springs
<b>CE2202.3</b>	To classify columns and calculation of load carrying capacity and to assess stresses due to axial and lateral loads
<b>CE2202.4</b>	Analyse the unsymmetrical bending in beams Location of neutral axis Deflection of beams under unsymmetrical bending
<b>CE2202.5</b>	Knowledge about different engineering applications like shafts, springs, columns and struts subjected to different loading conditions
<b>CE2202.6</b>	Classify the concepts of failures in the material by theories of failures

<b>Course Name: Hydraulics and Hydraulic Machinery</b>	
<b>Course Code: CE2203</b>	
<b>CE2203.1</b>	Differentiate uniform and non-uniform open channel flow problems
<b>CE2203.2</b>	Apply the principals of dimensional analysis and similitude in hydraulic model testing
<b>CE2203.3</b>	Understand the working principles of various hydraulic machineries and pumps
<b>CE2203.4</b>	Analyse the characteristics of hydraulic jump
<b>CE2203.5</b>	Determination of dimensional analysis for fluid flow problems
<b>CE2203.6</b>	Classify the various types of various types of hydraulic machines and Pumps



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<b>Course Name: Environmental Engineering</b>	
<b>Course Code: CE2204</b>	
CE2204.1	Analyse source based on quality and quantity and Estimate design population and water demand
CE2204.2	Design a water treatment plant for a village/city
CE2204.3	Estimation of the Sewage Treatment Plant for a town/city
CE2204.4	Classify the sewers and plumbing systems for building
CE2204.5	Apply the various methods to treatment the water
CE2204.6	Able to know the distribution systems of the water

<b>Course Name: Managerial Economics &amp; Financial Analysis</b>	
<b>Course Code: CE2205</b>	
CE2205.1	Able to know the knowledge of estimating the Demand and demand elasticity's for a product
CE2205.2	The knowledge of understanding of the Input-Output-Cost relationships
CE2205.3	Estimation of the least cost combination of inputs
CE2205.4	Prepare Financial Statements and the usage of various Accounting tools for Analysis
CE2205.5	evaluate various investment project proposals with the help of capital budgeting techniques for decision making
CE2205.6	Understand the concept of Capital, Capital Budgeting and the techniques used to evaluate Capital Budgeting proposals

<b>Course Name: Environmental Engineering lab</b>	
<b>Course Code: CE2206</b>	
CE2206.1	Estimate some important characteristics of water, wastewater and soil
CE2206.2	Draw some conclusion and decide whether the water is suitable for Drinking/Construction /Agriculture/ Industry
CE2206.3	Determination of Chloride, EC and Salinity of Soil and suggest their suitability for Construction/Agriculture
CE2206.4	Understand the strength of the sewage in terms of BOD and COD
CE2206.5	Able to classify the various properties water
CE2206.6	Demonstration of WHO guidelines, Effluent standards and standards for Construction/ Agriculture/Industry



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<b>Course Name: Strength of materials Lab</b>	
<b>Course Code: CE2207</b>	
<b>CE2207.1</b>	Determination of Tension test on Mild steel bar by UTM
<b>CE2207.2</b>	Understand the Bending test on cantilever beam of steel / wood
<b>CE2207.3</b>	Analyse the torsion test on specimen sample
<b>CE2207.4</b>	Able to know the Compression test on wood or concrete
<b>CE2207.5</b>	Apply the Brinnell's / Rock well's hardness testing machine for hardness of specimen
<b>CE2207.6</b>	Define the Verification of Maxwell's Reciprocal theorem on beams

<b>Course Name: Fluid Mechanics &amp; Hydraulics Machinery Lab</b>	
<b>Course Code: CE2208</b>	
<b>CE2208.1</b>	Understand the Calibration of Venturi meter & Orifice meter
<b>CE2208.2</b>	Determination of Coefficient of discharge for a small orifice and mouth piece by a constant head and variable head method
<b>CE2208.3</b>	Able to know the Verification of Bernoulli's equation
<b>CE2208.4</b>	Define the Performance test on Pelton wheel turbine
<b>CE2208.5</b>	Analyse the Calibration of contracted Rectangular Notch and /or Triangular Notch
<b>CE2208.6</b>	Apply the Hydraulic jump test setup to study of Study of Hydraulic jump



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**Year/Sem: III B.Tech I SEM**

<b>Course Name: Structural Analysis</b>	
<b>Course Code: CE3101</b>	
<b>CE3101.1</b>	Differentiate the between the determinate and indeterminate structures
<b>CE3101.2</b>	Analyse behaviour of structures due to the expected loads, including the moving loads, acting on the structure
<b>CE3101.3</b>	Classify the bending moment and shear forces in beams for different fixity conditions
<b>CE3101.4</b>	Understand the continuous beams using various methods
<b>CE3101.5</b>	Determination of three moment method, slope deflection method, energy theorems
<b>CE3101.6</b>	Able to know the influence line diagrams for various types of moving loads on beams/bridges

<b>Course Name: Design and Drawing of Reinforced Concrete Structures</b>	
<b>Course Code: CE3102</b>	
<b>CE3102.1</b>	Able to understand the various design methods in RCC
<b>CE3102.2</b>	Differentiate the over and under reinforced structures with loading
<b>CE3102.3</b>	Analysis and design of flexural members and detailing
<b>CE3102.4</b>	Classification of various types slabs in RCC
<b>CE3102.5</b>	Design different type of compression members and footings
<b>CE3102.6</b>	Understand different types of footings and design

<b>Course Name: Geotechnical engineering -I</b>	
<b>Course Code: CE3103</b>	
<b>CE3103.1</b>	Able to know the definition of the various quantities related to soil mechanics and Establish their inter-relationships.
<b>CE3103.2</b>	Determination of the various index properties of the soils and classify the soils
<b>CE3103.3</b>	Understand the importance of the different engineering properties of the soil
<b>CE3103.4</b>	Classify the properties of compaction, permeability, consolidation and shear strength and determine them in the laboratory
<b>CE3103.5</b>	understand the concept of shear strength of soils
<b>CE3103.6</b>	Differentiate the shear parameters of sands and clays and the areas of their application

<b>Course Name: Environmental Management</b>	
<b>Course Code: CE3104</b>	
<b>CE3104.1</b>	Understand the Plan and design the water and wastewater systems
<b>CE3104.2</b>	Analyse the he source of emissions and select proper control systems
<b>CE3104.3</b>	Able to know the Design & estimation of water supply system for a city
<b>CE3104.4</b>	knowledge about various environmental aspects
<b>CE3104.5</b>	Apply the suitable treatment flow for raw water treatments
<b>CE3104.6</b>	Differentiate the importance of Water and Wastewater Treatment Plant and supply system



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<b>Course Name: Construction Technology &amp; Management</b>	
<b>Course Code: CE3105</b>	
<b>CE3105.1</b>	Analyse the importance of construction planning
<b>CE3105.2</b>	Define the functioning of various earth moving equipment
<b>CE3105.3</b>	Able to know the methods of production of aggregate products and concreting
<b>CE3105.4</b>	Apply the gained knowledge to project management and construction techniques
<b>CE3105.5</b>	Classify the importance of safety in construction projects
<b>CE3105.6</b>	Understand the concept of project management including network drawing and monitoring

<b>Course Name: Survey Camp lab ( Field Work-II)</b>	
<b>Course Code: CE3106</b>	
<b>CE3106.1</b>	Determination Horizontal and Vertical Angles by the method of repetition method by theodolite
<b>CE3106.2</b>	Define the distance between two inaccessible points
<b>CE3106.3</b>	Able to know the curve setting method
<b>CE3106.4</b>	Apply the total station method to know the distance between two inaccessible points
<b>CE3106.5</b>	Analyse the Contouring maps
<b>CE3106.6</b>	Understand the Heights and distance problems using tachometric principles

<b>Course Name: Geotechnical Engineering Lab</b>	
<b>Course Code: CE3107</b>	
<b>CE3107.1</b>	Able to know the permeability of soils
<b>CE3107.2</b>	Understand the Compaction, Consolidation and shear strength characteristics
<b>CE3107.3</b>	Analyse the index properties of the soils
<b>CE3107.4</b>	Differentiate the various types and classifications of the soils
<b>CE3107.5</b>	Apply Atterberg's Limits to know plasticity of soils
<b>CE3107.6</b>	Differentiate the Permeability, Compaction, consolidation, shear strength parameters & CBR value





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Year/Sem: III B.Tech II SEM

<b>Course Name: Design And Drawing of Steel Structures</b>	
<b>Course Code: CE3201</b>	
CE3201.1	Understand the various Work relevant IS codes
CE3201.2	Analysis and design of flexural members and detailing
CE3201.3	Able to Design compression members of different types with connection detailing
CE3201.4	Understand Design of tension and compression members in trusses
CE3201.5	Differentiate the Plate girder and Gantry Girder and their Design
CE3201.6	Apply the drawings pertaining to different components of steel structures

<b>Course Name: Water Resource Engineering</b>	
<b>Course Code: CE3202</b>	
CE3202.1	Able to understanding of the theories and principles governing the hydrologic processes
CE3202.2	Analyse the quantify hydrological components
CE3202.3	Apply concepts in hydrologic design of water resources projects
CE3202.4	Define Intensity-Duration-Frequency and Depth-Area Duration curves to design hydraulic structures
CE3202.5	Differentiate flow mass curve and flow duration curve
CE3202.6	Develop unit hydrograph and synthetic hydrograph

<b>Course Name: Geotechnical Engineering-II</b>	
<b>Course Code: CE3203</b>	
CE3203.1	Able to understand the various types of shallow foundations
CE3203.2	Analyse and compute the magnitude of foundation settlement and decide on the size of the foundation accordingly
CE3203.3	Define the field test data and arrive at the bearing capacity
CE3203.4	Design the principles of bearing capacity of piles
CE3203.5	Differentiate the principles of important field tests such as SPT and Plate bearing test
CE3203.6	Able to know the concepts of pile foundations and determine their load carrying capacity



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<b>Course Name: Advanced Structural Analysis</b>	
<b>Course Code: CE3204</b>	
<b>CE3204.1</b>	Differentiate Determinate and Indeterminate Structures
<b>CE3204.2</b>	Able to understand the Carryout lateral Load analysis of structures
<b>CE3204.3</b>	Analyse Cable and Suspension Bridge structures
<b>CE3204.4</b>	Apply Moment Distribution, Kani's Method and Matrix methods
<b>CE3204.5</b>	Define the elastic curves on the structures
<b>CE3204.6</b>	Classify the shear force and bending moment diagrams

<b>Course Name: Elements of Civil Engineering</b>	
<b>Course Code: CE3205</b>	
<b>CE3205.1</b>	Able to understand the basics of Civil Engineering concepts
<b>CE3205.2</b>	Analyse the surveying the elevations and mapping
<b>CE3205.3</b>	Classify the construction materials and elements
<b>CE3205.4</b>	Able to know overall infrastructure development
<b>CE3205.5</b>	Applying various methods to water resources development and grid system
<b>CE3205.6</b>	Differentiate the watershed methods and sources of water

<b>Course Name: Estimation , Costing and Contracts Lab</b>	
<b>Course Code: CE3206</b>	
<b>CE3206.1</b>	Able to determine the quantities of different components of buildings
<b>CE3206.2</b>	Understand the quantity calculations of different components of the buildings
<b>CE3206.3</b>	Define the position to find the cost of various building components
<b>CE3206.4</b>	Applying the Conditions of contract, Valuation of buildings
<b>CE3206.5</b>	Able to know the capable of finalizing the value of structures
<b>CE3206.6</b>	Differentiate single, double and four roomed buildings by Detailed Estimation of Buildings using individual wall method

<b>Course Name: Remote Sensing &amp; GIS Lab</b>	
<b>Course Code: CE3207</b>	
<b>CE3207.1</b>	Able to understand the Work comfortably on GIS software
<b>CE3207.2</b>	Define Digitize and create thematic map and extract important features
<b>CE3207.3</b>	Classifying the Develop digital elevation model
<b>CE3207.4</b>	Differentiate the Interpretation and Estimation of features from satellite
<b>CE3207.5</b>	Analyse and Modelling using GIS software
<b>CE3207.6</b>	Apply GIS software to simple problems in water resources, transportation engineering and Agriculture



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<b>Course Name: Civil Engineering Practice Lab</b>	
<b>Course Code: CE3208</b>	
<b>CE3208.1</b>	Able to know practical aspects of Civil Engineering profession to the students
<b>CE3208.2</b>	Define various design and construction procedures of Civil Engineering projects
<b>CE3208.3</b>	Applying important codes and by-laws that will benefit young professionals
<b>CE3208.4</b>	Classify Important case studies of Civil Engineering including buildings, bridges
<b>CE3208.5</b>	Analyse Environmental impacts, Safety rules for construction, Energy consumption, Sustainability and recycling practices, Optimization and costing
<b>CE3208.6</b>	Differentiate the retrofitting buildings and models



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Year/Sem: IV B.Tech I SEM

<b>Course Name: Design And Drawing of Steel Structures</b>	
<b>Course Code: CE4101</b>	
CE4101.1	Understand the various Work relevant IS codes
CE4101.2	Analysis and design of flexural members and detailing
CE4101.3	Able to Design compression members of different types with connection detailing
CE4101.4	Understand Design of tension and compression members in trusses
CE4101.5	Differentiate the Plate girder and Gantry Girder and their Design
CE4101.6	Apply the drawings pertaining to different components of steel structures

<b>Course Name: Geotechnical Engineering-II</b>	
<b>Course Code: CE4102</b>	
CE4102.1	Able to understand the various types of shallow foundations
CE4102.2	Analyse and compute the magnitude of foundation settlement and decide on the size of the foundation accordingly
CE4102.3	Define the field test data and arrive at the bearing capacity
CE4102.4	Design the principles of bearing capacity of piles
CE4102.5	Differentiate the principles of important field tests such as SPT and Plate bearing test
CE4102.6	Able to know the concepts of pile foundations and determine their load carrying capacity

<b>Course Name: Remote Sensing &amp; GIS</b>	
<b>Course Code: CE4103</b>	
CE4103.1	Understand the basic principles of Remote Sensing and GIS techniques
CE4103.2	Able to learn various types of sensors and platforms
CE4103.3	Differentiate the aerial photographs and satellite imageries
CE4103.4	Create and input spatial data for GIS application
CE4103.5	Apply RS and GIS concepts for application in Civil Engineering
CE4103.6	Classify the spatial data structures, raster and vector data formats



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<b>Course Name: Elements of Civil Engineering</b>	
<b>Course Code : CE4104</b>	
<b>CE4104.1</b>	Able to understand the basics of Civil Engineering concepts
<b>CE4104.2</b>	Analyse the surveying the elevations and mapping
<b>CE4104.3</b>	Classify the construction materials and elements
<b>CE4104.4</b>	Able to know overall infrastructure development
<b>CE4104.5</b>	Applying various methods to water resources development and grid system
<b>CE4104.6</b>	Differentiate the watershed methods and sources of water

<b>Course Name: Earth &amp; Rock fill Dams</b>	
<b>Course Code: CE4105</b>	
<b>CE4105.1</b>	Able to design earth and rock fill dams
<b>CE4105.2</b>	Understand and get familiarity with slope stability calculations
<b>CE4105.3</b>	Classify the prevention techniques for slope failures
<b>CE4105.4</b>	Differentiate the Failures, Damages and Protection of Earth Dams
<b>CE4105.5</b>	Define total stress analysis versus effective Stress analysis
<b>CE4105.6</b>	Able to know Suitability of materials for earth and rock fill dams

<b>Course Name: Remote Sensing &amp; GIS Lab</b>	
<b>Course Code: CE4106</b>	
<b>CE4106.1</b>	Able to understand the Work comfortably on GIS software
<b>CE4106.2</b>	Define Digitize and create thematic map and extract important features
<b>CE4106.3</b>	Classifying the Develop digital elevation model
<b>CE4106.4</b>	Differentiate the Interpretation and Estimation of features from satellite image
<b>CE4106.5</b>	Analyse and Modelling using GIS software
<b>CE4106.6</b>	Apply GIS software to simple problems in water resources, transportation engineering and Agriculture

<b>Course Name: Geotechnical Engineering Lab</b>	
<b>Course Code: CE4107</b>	
<b>CE4107.1</b>	Able to know the permeability of soils
<b>CE4107.2</b>	Understand the Compaction, Consolidation and shear strength characteristics
<b>CE4107.3</b>	Analyse the index properties of the soils
<b>CE4107.4</b>	Differentiate the various types and classifications of the soils
<b>CE4107.5</b>	Apply Atterberg's Limits to know plasticity of soils
<b>CE4107.6</b>	Differentiate the Permeability, Compaction, consolidation, shear strength parameters & CBR value



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**Year/Sem: IV B.Tech II SEM**

<b>Course Name: Estimation Specifications and Contract</b>	
<b>Course Code: CE4201</b>	
<b>CE4202.1</b>	Able to determine the quantities of different components of buildings
<b>CE4202.2</b>	Analyse position to find the cost of various building components
<b>CE4202.3</b>	Understand the capable of finalizing the value of structures
<b>CE4202.4</b>	Differentiate various specifications and components of the buildings
<b>CE4202.5</b>	Understand the quantity calculations of different components of the buildings
<b>CE4202.6</b>	Classifying the types of contracts & documents

<b>Course Name: Disaster Management &amp; Mitigation</b>	
<b>Course Code: CE4202</b>	
<b>CE4202.1</b>	Application of Disaster Concepts to Management
<b>CE4202.2</b>	To Understand Definitions and Terminologies used in Disaster Management
<b>CE4202.3</b>	Analysing Relationship between Development and Disasters
<b>CE4202.4</b>	Ability to understand Categories of Disasters
<b>CE4202.5</b>	Differentiate the types of disasters
<b>CE4202.6</b>	Able to know the responsibilities of government, community, local institutions, NGOs and other stakeholders

<b>Course Name: Ground Improvement Techniques</b>	
<b>Course Code: CE4203</b>	
<b>CE4203.1</b>	Able to possess the knowledge of various methods of ground improvement and their suitability
<b>CE4203.2</b>	Differentiate to learn the concepts, purpose and effects of grouting
<b>CE4203.3</b>	Understand the position to design a reinforced earth embankment and check its stability
<b>CE4203.4</b>	Classify the various functions of Geosynthetics and their applications in Civil Engineering practice
<b>CE4203.5</b>	Able to know reinforced earth technology and soil nailing can obviate the problems posed by the conventional retaining walls
<b>CE4203.6</b>	Defining the improvement of engineering performance of soils