SEMESTER VI

S. No.	Subject Code	Board of Study	SUBJECT	Periods per week			Scheme of Examination and Marks				Credit L+(T+P)/2 (L+T+P)
				L	T	P	PRE**		ESE*	Total Marks	
							Mid Sem	TA			
1	SOE-B-CE601	CIVIL	Structural Engineering Design-II	3	0	0	30	20	50	100	3
2	SOE-B-CE602	CIVIL	Geotechnical Engineering-II	3	0	0	30	20	50	100	3
3	SOE-B-CE603	CIVIL	Environmental Engineering I	3	0	0	30	20	50	100	3
4	SOE-B-CE604	CIVIL	Construction Planning and Management	3	0	0	30	20	50	100	3
5	SOE-B-CE605(1-9)	CIVIL	Professional Elective -I (**CIE Annexure - I**)	3	0	0	30	20	50	100	3
6	SOE-B-CE606	CIVIL	Structural Engineering Design-II Lab	0	0	4	0	30	20	50	2
7	SOE-B-CE607	CIVIL	Geotechnical Engineering-II Lab	0	0	4	0	30	20	50	2
8	SOE-B-CE608	CIVIL	Environmental Engineering Lab	0	0	4	0	30	20	50	2
9	SOE-B-CE609	CIVIL	Professional Development	0	0	1	0	25	25	50	1
10	SOE-B-CE610	CIVIL	Microsoft Project (MS Project)	1	0	2	15	15	20	50	2
TOTAL				16	0	15	165	230	355	750	24

Professional Elective-I (CIE Annexure - I)

Sr. No	Courses	Name of the Courses
1	SOE-B-CE605(1)	Design of Bridge Structures
2	SOE-B-CE605(2)	Traffic Engineering
3	SOE-B-CE605(3)	Solid Waste Management
4	SOE-B-CE605(4)	Computer Methods in Structural Analysis
5	SOE-B-CE604(5)	Maintenance, Repair and Rehabilitation of Civil Engineering Structures (MRCS)
6	SOE-B-CE605(6)	Remote Sensing and GIS in Civil Engineering
7	SOE-B-CE605(7)	Urban Infrastructure
8	SOE-B-CE605(8)	Town Planning
9	SOE-B-CE605(9)	Systems Approach in Civil Engineering

* End Semester Examination

** Progress Review Examination

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Semester: VI **Branch: Civil Engineering**

Subject: Structural Engineering Design-II **Code: SOE-B-CE601**

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Course Description

This course gives Introduction to different methods of design of elements of steel structure, principally aimed to introduce the students about various elements of steel structure and their behavior under applied load. It makes student aware about the concepts of selection of cross section to transmit design load without risk of failure.

It also emphasized on the safe, efficient and economical design of some major elements of the infrastructure which are made up of steel material.

Course Objectives

The students should be able -

- To know about the advantages of steel as a structural over others.
- To know about shapes and grades of structural steel available.
- To know about the different methods of design and the advantages of limit state design over other methods.
- To select the appropriate type of fasteners for joints.
- To understand the behavior of structural steel under tension, compression and flexure.

Syllabus:

UNIT I

Methods of Design (Working stress and Limit state): Types of Structural Steel, Advantages of steel as a structural material, Rolled Sections - Tapered Flange and Parallel Flange, Built up sections, Convention for Member Axes. Plastic Theory, Shape factor, Methods of design, Limitations of Working stress and Plastic design methods, Advantages of Limit State Design, Limit States of Strength and Serviceability, Partial Safety Factors, Loads and Load Combinations, Maximum effective slenderness ratio.

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UNIT II

Riveted/Bolted & Welded Connection: Location details of fasteners, Bearing type bolts, Friction Grip type Bolting, Welds and Welding, Advantages and Disadvantages of Welded Connections, Lap and Butt Joints, Truss Joint Connections by bolts and welds.

UNIT III

Tension Members: Design Strength due to Yielding of cross Section, Rupture of Critical Section, Block Shear, Design of Axially Loaded Steel Angles Tension Members.

UNIT IV

Compression Members: Design Strength, Effective length of compression members, Design of Axially loaded Steel Angles compression members, Design of Column bases under axial load, Laced Columns, Battened columns.

UNIT V

Beams (Flexural Members): Design Strength in Bending (Flexure), Effective length for lateral torsional buckling, Shear, Design of Laterally Supported and Laterally Unsupported Beams with unstiffened webs.

Text Books:

1. Design of Steel Structures - N. Subramanian (Oxford University Press)

2. Limit State Design of Steel Structures – S. K. Duggal (Tata McGraw Hill)

3. Design of Steel Structures - Negi, B.S. (Tata McGraw Hill India)

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Reference Books:

1. Indian Standard – General Construction in Steel –Code of Practice (3rd Revision) (IS:800 – 2007)

2. Design of Steel Structures – K. S. Sai Ram (Pearson Education)

3. Structural Steel Design: LRFD Method – J. C. McCormac, J. K. Nelson (Pearson Education)

4. Limit State design in Structural Steel – M. R. Shiyekar (PHI Learning)

5. Limit State Design of Steel Structures (IS:800-2007) – V. L. Shah, V. Gore (Structures Publications)

Course Outcomes:

- To develop ability to select adequate shape and grade of structural steel.
- To understand the basis of economical and safe design of steel structures.
- To develop ability of choosing proper fastener for a particular joint.
- To Make use of knowledge of analysis in structural planning and design of various components of buildings.

Assessment:

Assessment can vary from course to course and can include a combination of class work, tutorials, assignments, quizzes, surprise test, online test, project work and exams.

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Semester: VI **Branch: Civil Engineering**

Subject: Geo-technical Engineering - I I **Code: SOE-B-CE602**

Course Description

The objective of this course is to to develop an understanding of concepts regarding the stability and settlement analysis of Geotechnical problems. In this course, students will understand the basics of soils through hands on experience in the Geotechnical laboratory. Some of the important topics that students will learn during the course: soil structure and grain size: identification and classification of soils for engineering purposes; physical and engineering properties of soils; fundamental behavior of soils subjected to various forces; groundwater and seepage through soils; compaction; consolidation; shear strength; and bearing capacity of soils.

Course Objectives

1. To know about the stability of slopes and stability analysis.
2. To study about the earth pressure in different condition of soil, Coulomb earth pressure theories, earthquake loading.
3. To study about Determination of bearing capacity of soil.
4. To study about the types of shallow foundation basic for design, bearing capacity of soil and settlement of foundation.
5. To get the knowledge about another types of foundation like well and pile foundation and their design criterion.

Syllabus:

UNIT I

Stability of slopes: Stability analysis of infinite slopes, Stability analysis of finite slopes, Swedish circle method, Friction circle method, Bishop's method, Taylor's stability number and use of charts, stability analysis of earth dam slopes for different conditions.

UNIT II

Earth pressures: Earth pressure theories of lateral earth pressure, Active and passive earth pressures in cohesion less and cohesive soils, Rankine's and Coulomb's earth pressure theories Types of retaining structures, Stability considerations of gravity and cantilever retaining walls.

UNIT III

Bearing Capacity: Terzaghi's bearing capacity theory, computation of bearing capacity in soils, Bearing capacity of Square, Rectangular, Circular and Continuous footings, Meyerhof's theory, Skempton's method, Effect of ground water table on bearing capacity.

Foundations: Types of foundations, Depth of foundation, Design of shallow foundations from laboratory and field test data, Settlement analysis of footings.

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UNIT IV

Pile Foundation: Classification of piles. Load carrying capacity of piles. Types and methods of construction, estimation of pile capacity from static and dynamic formulae. Group action of piles. capacity and settlement of group of piles. Pile load tests. Negative skin friction.

UNIT V

Well foundation: Types and elements of well foundation method of construction . tilts and shifts. Remedial measures.

Machine foundation: Introduction of machine foundation, types of machines and their foundations. Design criteria. Field methods of determining design Parameters. block vibration test. response of block foundations under vertical vibrations. I.S. code recommendations. **Foundation on Expansive soil :** Identification of expansive soil. contaminated soil. problems associated with contaminated and expansive soil. design consideration of foundation on expansive soil.

Text Books:

1. Ranjan, G. and Rao, A.S.R. (2016). Basic and Applied Soil Mechanics. 3rd Edition. New Age International Publishers. India.
2. Arora, K.R. (2020) . Soil Mechanics And Foundation Engineering - Geotechnical Engineering. Standard publisher dist.
3. Murthy. V.N.S. (2006). Geotechnical Engineering. Marcel Dekker Inc. New York. USA.

Reference Books:

1. Lambe. T.W. and Whitman. R.V. (1991). Soil Mechanics. John Wiley & Sons.
2. Budhu. M. (2010). Soil Mechanics and Foundations. John Wiley & Sons.
3. Gulhati S.K. and Datta. M. (2005). Geotechnical Engineering.Tata McGraw-Hill Publishing Company Limited. New Delhi.
4. Das. B.M. (2011). Principle of Foundation Engineering. 7th Edition. Cengage Learning. USA.

Course Outcomes:

Students will be able to understand:

1. Analytical methods of slope stability analysis.
2. Study and evaluation of lateral earth pressure in soil. Stability analysis of rigid retaining structures.
3. Determination of bearing capacity of soil.
4. Geotechnical design and settlement evaluation of shallow foundations.
5. Design of deep foundation, selection of type of deep foundation ,design criterion for pile foundation.

Assessment:

Assessment will be based on a combination of attendance, class work. tutorials. assignments and exams.

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Semester: VIBranch: Civil Engineering
Subject: Environmental Engineering-I **Code: SOE-B-CE603**

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Course Description:
Environmental Engineering has its vast application and importance since the inception of civilization. This subject consists of fundamental concepts in the field of water supply along with an overview on other environmental parameters like air, noise Pollution.

Course Objectives:

- To know the basic and methods of water supply.
- To study the various sources and properties of water.
- To learn the objectives and methods of water treatment and the features & functions of water treatment units.
- To understand the various methods of conveyance of water.
- To understand the basics of Air and Noise pollution.

Syllabus:

Unit –I
Introduction- Water Supply:
Water demands and domestic use, variation in demands; population forecasting, basic needs and factors affecting consumption, design period. Sources of water and their characteristics, factors governing the selection of a source of water supply. Intakes works, numerical problems on water demand, forecasting, variation in demand and design period.

Unit –II
Water Quality
Common impurities, physical, chemical and biological characteristics of water: Acidity, Basicity, Hardness, residual chlorine, biochemical oxygen demand, chemical oxygen demand, breakpoint chlorination, Drinking water permissible limits (Indian standard).

Unit-III
Water Treatment:
Sedimentation :Objectives of water treatment, Theory of sedimentation, sedimentation tanks and its types, design parameters related with sedimentation tanks, sedimentation with coagulation.
Filtration: Theory of filtration, slow sand filter and rapid sand filters, pressure filters, construction and operation.
Disinfection: Methods of disinfection, Chlorination and water softening.

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Unit- IV

Hydraulic design:

Hydraulic design of Conveyance main, various types of conveyance main, losses in conveyance main.Hydraulic design of elevated service reservoir.

Distribution System: Layout of distribution system, methods of distribution, distribution reservoirs, function and its types, storage capacity of distribution reservoirs. Hydraulic design of water distribution system.

Unit- V

Air & Noise Pollution:

Air Pollution: Sources, classification, characteristics, effects. Air pollution control systems: Classification and types, Standards and limits, Introduction to particulate emission control Equipment-Gravitational settling chamber, Cyclone separator, Fabric filter, Electrostatic precipitator, Wet scrubbers.

Noise Pollution: Sources, effects, permissible limits and control of noise pollution.

Text Books:

1. Environmental Engineering, Vol. I , Garg .S.K. Khanna Publications, New Delhi.
2. Water supply and sanitary engineering. Birdie G. S. and Birdie J. S. Dhanpat Rai Publications.

Reference Books:

1. Environmental Engineering- Peavy, Howard S., Rowe, Donald R and Tchobanoglous, G. McGraw Hill Education (India) Pvt. Ltd., New Delhi.

Course Outcomes:

The students completing the course will have

- An insight into the structure of drinking water supply systems, including water transport, treatment and distribution.
- An understanding of water quality criteria and standards, and their relation to public health.
- The ability to design and evaluate water supply project.

Assessment:

Combination of class work, tutorials, assignments, laboratory work, quizzes, surprise test, online test, project work and exams.

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Semester: VI **Branch: Civil Engineering**

Subject: Construction Planning and Management **Code: SOE-B-CE604**

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Course Description

- This course equips students with proficiency in tools of civil engineering focusing on effective construction management practices, modern construction materials and techniques. The program trains enrolled candidates in the specialized field of construction of special structures towards accomplishing critical projects within a given schedule and budget.

Course Objectives

The students should be able -

- To provide a coherent development to the students for the courses in sector of construction.
- To present the foundations of many basic engineering concepts related to construction management.
- To give an experience in the implementation of engineering concepts which are applied in field of construction.
- To involve the application of scientific and technological principles of planning, analysis, construction of building according to construction management philosophy.

Syllabus:

Unit I:

The Owner's Perspective: Introduction-The project life cycle-Major Types of Construction-Selection of Professional Services, Construction contractors-Financing of constructed facilities-Legal and regulatory Requirements-The changing Environment of the construction Industry-The Role Project Managers.

Unit II:

Organizing for Project Management: What is project management – Trends in Modern Management-Strategic planning and project programming- Effects of project risks on organization, Organization of Project Participants.

Unit III:

The Design and Construction Process Design and construction as an integrated System- Innovation and technological feasibility-Design Methodology-Functional Design-Physical Structures-Geotechnical Engineering Investigation-Construction Site Environment-Value engineering-Construction Planning-Industrialized Construction and Prefabrication-Computer - Aided Engineering

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Unit IV:

Labour, Material and Equipment Utilization: Historical Perspective – Labour Productivity-Factors Affecting Job-Site Productivity-Labour Relations in Construction- Equipment Choice of Equipment and Standard Production Rates-Construction

Unit V

Cost Estimation: Costs Associated with Construction Facilities-Approaches to cost Estimation-Type of construction cost estimates- Effects of scale on construction Cost-Unit cost-Method of estimation-Methods for allocation of joint costs- Historical cost data-Cost indices-Applications of cost Indices to Estimating Estimate based on Engineers List of Quantities-Allocation of Construction costs over time-Computer Aided cost Estimation-Estimation of operating costs

Text Books:

1. Construction Project Management Planning, Scheduling and Control – Chitkara, K.K. (Tata McGraw Hill Publishing Co., New Delhi, 1998)
2. Project Mangement: A systems Approach to Planning, Scheduling and Controlling – Harold Kerzner (CBS Publishers & Distributors, Delhi, 1988)

Reference Books:

1. Project management for Construction: Fundamental Concepts for owners, Engineers, Architects and Builders – Chris Hendrickson and Tung Au, (Prentice Hall, Pitsburgh, 2000)
2. Construction Project Management – Frederick E.Gould (Wentworth Institute of Technology, Vary E.Joyce, Massachususetts Institute of Technology, 2000)
3. Project Management – Choudhury, S. (Tata McGraw Hill Publishing Co., New Delhi, 1988)
4. Applied project Engineering and Management – Ernest E. Ludwig (Gulf Publishing Co., Houstan, Texas, 1988)

Course Outcomes:

- The students identify, analyse and implement suitable planning and management techniques
- Create network, calculate project duration and optimize the time and minimize the cost
- Implement resource allocation and control techniques
- Plan and implement quality and safety management

Assessment:

Assessment can vary from course to course and can include a combination of class work, tutorials, assignments, laboratory work, quizzes, surprise test, online test, project work and exams.

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Semester: VI **Branch: Civil Engineering**

Subject: Design of Bridge Structures **Code: SOE-B-CE605(1)**

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Course Description

This course in Bridge engineering generally introduces the fundamental concepts, principles and application of superstructure and substructure analysis and design for the undergraduate students of civil engineering. This course "Bridge Engineering" goes deeper into the various aspects of Bridge engineering along with bringing out the theories and knowledge of Bridge engineering.

Course Objectives

The students should be able -

- To choose appropriate bridge structure and design it for given site conditions.
- To understand the behavior of structural elements of bridges and shall be able to analyze and design.
- To study the loads, forces on bridges and design of several types of bridges

Syllabus:

UNIT I

Introduction:

History of Bridges, Components of a Bridge and its definitions, Classification of Road Bridges, related structures, span length importance of bridge, selection of bridge site, preliminary data to be collected, design discharge and its determination, linear waterway, economical span, vertical clearance above HFL, scour depth, choice of bridge type.

UNIT II

Reinforced Concrete Slab Bridges

Design of solid slab bridges for IRC loading - Design of kerb - Design of tee beam bridges - Illustrative design example of solid slab bridge and tee beam bridge for IRC loading

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UNIT III

Steel Bridges

Design of through type steel highway bridges for IRC loading. Illustrative design example of stringers, cross girders and main girders design.

UNIT IV

Prestressed Concrete Bridges

Design of girder section, maximum and minimum pressurising forces, Eccentricity, Live load and dead load shear forces, Cable Zone in girder, check for stresses at various sections, check for diagonal tension, Diaphragms, End block, short term and long term deflections.

UNIT V

Sub Structure:

Types of piers and abutments, design forces, design of piers and abutments. Bearing and Joints: Various types of expansion bearing and fixed bearings, elastomeric bearings, joints and their types.

Text Books:

1. Victor D J "Essentials of Bridge Engineering" Oxford and IBH Publishers, New Delhi, 2003.
2. Vazirani & Ratwani "Design of Concrete Bridges, Khanna Publishers, New Delhi, 1986.
3. Bindra S P "Principles and Practice of Bridge Engineering" Dhanpat Rai & sons, New Delhi, 1999.
4. Punmia B.C., Jain A.K.," Design of Steel Structure", Laxmi Pub.(P) Ltd.,2009.

Reference Books:

1. Phatak D.R., "Bridge Engineering", Satya Prakashan, New Delhi, 1990.
2. Ponnuswamy S," Bridge Engineering" Tata McGraw Hill, New Delhi,2003.
3. Punmia B.C., Jain A.K.,"RCC Designs", Laxmi Pub.(P) Ltd.,2003

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4. Jagadeesh.T.R. and Jayaram.M.A., "Design of Bridge Structures", Prentice Hall of India Pvt. Ltd. 2004.
5. Johnson Victor, D. "Essentials of Bridge Engineering", Oxford and IBH Publishing Co. New Delhi, 2001.

Course Outcomes:

At the end of this course students will be able to design different types of RCC bridges, Steel bridges and pre-stressed concrete bridges with the bearings and substructures.

Assessment:

Assessment can vary from course to course and can include a combination of class work, tutorials, assignments, quizzes, surprise test, online test, project work and exams.

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Semester: VI **Branch: Civil Engineering**

Subject: Traffic Engineering **Code: SOE-B-CE605(2)**

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Course Description

Introduction to traffic engineering includes analysis, operation, and control associated with traffic studies, basics of traffic signal design and phase timing, analysis and design of pre-timed and actuated signalized intersections, signal coordination for arterials, etc.

Course Objectives

1. To develop the fundamental knowledge of Traffic Engineering.
2. To know the problems occurring due to mixed traffic in developing countries.
3. To know the details of traffic flow.
4. To develop the use of signs, signals, and islands.
5. To develop the knowledge about the occurrence of accidents and their reduction.
6. To develop the knowledge of different pollution and its remedial measures.

Syllabus:

UNIT – I

Traffic Characteristics: Road user's characteristics - general human characteristics, physical, mental and emotional factors, factors affecting reaction time, PIEV theory. Vehicular characteristics: Characteristics affecting road design-width, height, length, and other dimensions. Weight, power, speed, and braking capacity of a vehicle.

UNIT – II

Traffic Studies: Spot Speed Studies and Volume Studies. Speed and Delay Studies purpose, causes of delay, methods of conducting speed and delay studies. Origin and destination Studies (O& D): Various methods, collection, and interpretation of data, planning, and sampling. Traffic

Capacity Studies: Volume, density, basic practical and possible capacities, level of service. Parking Studies: Methods of parking studies cordon counts, space inventories, parking practices.

UNIT – III

Traffic Operations and Control: Traffic regulations and various means of control. One-way streets-advantages and limitations. Traffic signals- isolated signals, coordinated signals, simultaneous, alternate, flexible, and progressive signal systems. Types of traffic signals, fixed time signals, traffic actuated signals, speed control signals, pedestrian signals, flashing signals, clearance interval, and problems on the single isolated traffic signal.

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UNIT – IV

Accident Studies & Mass Transportation: Causes of accidents, accident studies and records, condition and collision diagram, preventive measures. Expressways and freeways, problems on mass transportation and remedial measures, a brief study of mass transportation available in the country.

UNIT – V

Traffic Management: Transportation System Management (TSM) - Travel Demand Management (TDM), Traffic Forecasting techniques, Restrictions on turning movements, One-way Streets, Traffic Segregation, Traffic Calming, Tidal flow operations, Exclusive Bus Lanes.

Text Books:

1. Textbook of Highway and Traffic Engineering, S. C. Saxena, 2020, Publishers and Distributions Pvt. Ltd.
2. Traffic Engineering and Transport Planning, L.R. Kadiyali,1987, Khanna Publishers, Delhi, Third Edition.

Reference Books:

1. Traffic Engineering Handbook, B. Wolshon and A Pande, 2016, Institute of Transportation Engineers, John Willey and Sons, Seventh Edition.
2. Traffic and Transportation Planning, Samuel Morgan, 2016, Willford Press,
3. Transport Planning and Traffic Engineering, Flaherty, CAO'(Ed.), 2006, Elsevier Butterworth Heinemann, Sixth Edition
4. Traffic Flow Fundamentals, A.D. May, 1990, Prentice-Hall, Englewood Cliffs, New Jersey.

Course Outcomes:

Students will be able to understand:

1. Problem and remedial measures in mixed traffic in a developing country.
2. Traffic characteristics in detail.
3. It will help in reducing accidents.
4. Geometric design of road and road lighting.
5. Controlling the different pollution occurring on road.

Assessment:

Assessment will be based on a combination of attendance, class work, tutorials, assignments and exams.

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Semester: VI **Branch: Civil Engineering**

Subject: Solid Waste Management **Code: SOE-B-CE605(3)**

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Course Description:

This course covers engineering and scientific concepts and principles applied to the management of municipal solid waste (MSW) to protect human health and the environment and the conservation of limited resources through resource recovery and recycling of waste material. Topics include regulatory aspects and hierarchy of integrated solid waste management; characterization and properties of MSW. Municipal solid waste collection, transfer, and transportation, separation, processing, combustion, composting, and recycling of waste material; and the landfill method of solid waste disposal.

Course Objectives:

- To impart knowledge and skill for solid waste identification, classification and Components of solid waste, and their management.
- Develop insight into the collection, transfer, and transport of municipal solid waste.
- To design and operation of a municipal solid waste landfill.
- Develop insight into recycling and waste to energy facility.

Syllabus:

UNIT I

SOLID WASTE

Definition of solid wastes, types of solid wastes, sources of solid wastes, characteristics of solid wastes, physical, chemical and biological characterization, methods of sampling, factors affecting the generation of solid waste, effects of improper disposal of solid waste - public health effects, impact on environmental health, future challenges and opportunities.

UNIT II

SOLID WASTE MANAGEMENT

Principle of solid waste management, hierarchy of waste management options, integrated solid waste management, physical and chemical composition of municipal solid waste, different methods for generation rates, quantity assessment of solid wastes. Storage- movable bins, fixed bins. Collection- home to home collection, community bin system. Theory and design of hauled container system, stationary container system.

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UNIT III
TRANSFER AND PROCESSING TECHNIQUES

Transfer stations-types and selection of location, operation and maintenance, labeling and handling of different solid wastes-hazardous waste, biomedical wastes, radioactive waste, E-wastes. Transport means- handcart, tri-cycle, animal cart, tripper truck, dumper placer, bulk refuse carrier, railroad transport. Engineering system for on-site handling and processing of solid waste- separators, size reduction equipment's, screening equipment's, densification, baling, cubing, pelleting equipment's.

UNIT IV
COMPOSTING

Biological and chemical techniques for energy and other resource recovery: composting, types of composting, process description, design and operational consideration of anaerobic composting, vermin composting, termiradation, fermentation, incineration and pyrolsis system- theory and types, its by-products.

UNIT V
LANDFILLING

Dumping of solid waste, site selection criteria, landfill layout, landfill sections, occurrence of gases and leachate in landfills- composition and characteristics and its control, control of contamination of ground water. Solid waste management rules, status of solid waste management in India, cost economics of solid waste management.

Text Books:

1. Tchobanoglous, G., Theisen, H., & Vigil, S.A; Integrated Solid Waste Management: McGraw Hill, New York
2. Bhide, A.D., B.B. Sundaresan, Solid Waste Management in developing countries

References:

1. CPHEEO, Manual on Municipal Solid waste management, Central Public Health and Environmental Engineering Organization, Government of India, New Delhi, 2000.
2. Datta, M; Waste Disposal in Engineered Landfills, Narosa Publishers, Delhi.

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Course Outcomes:

- Identify key sources, typical quantities generated, composition, and properties of solid and hazardous wastes;
- Identify waste disposal or transformation technics (landfills and incinerators);
- Recognize the relevant regulations that apply for facilities used for disposal, and destruction of waste;
- Conduct invasive and non-invasive site investigation and understand permitting process for constructing landfills;
- Identify and design Solid and Hazardous Waste Landfills (RCRA Subtitle D and C) including closure, post-closure, and rehab issues;
- Estimate typical waste disposal costs; and
- Identify recycling and reuse options (composting, source separation, and re-use of shredded tires, recycled glass, fly ash, etc.).

Assessment:

Assessment can vary from course to course and can include a combination of class work, tutorials, assignments, laboratory work, quizzes, surprise test, online test, project work and exams.

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Semester: VI **Branch: Civil Engineering**

Subject: Computer Methods in Structural Analysis **Code:SOE-B-CE605(4)**

Course Description

This course helps students to Understand the fundamental concepts and theories of Matrix Methods which is prominently used to analysis of skeletal structures such as beams, plane and space trusses, and plane and space frames. it also make students to understand the fundamental concepts and theories of Finite Element Methods for analysis of continuum structures such as plane stress, plane strain and competence in applying these theories to solve problems manually as well as using computer programs.

Course Objectives

The students should be able -

- To the theory and application of computer methods of structural analysis including Matrix Methods and the Finite Element Method of structural analysis.
- Students will develop their own computer program and will also use commercial software for analyzing structures.

Syllabus:

UNIT I

Introduction: Introduction and Review of Structural Mechanics. Stiffness Method : Element wise Approach (Element Stiffness Matrices, Transformation Matrices and Transformation Process). Stiffness Method – Element-wise Approach (Assembly Process, Incorporation of Boundary Conditions, Solution Technique, Determination of Member Forces).

UNIT II

FEM: Historical Background - Basic Concept of FEM - Engineering problems and governing differential equations – Finite element modelling – Discretisation - Node, Element - different types of element – Approximate Solutions.

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UNIT III

Finite Element Analysis of One Dimensional Problem:

One dimensional problems - Coordinate systems – global, local and natural coordinate systems, shape functions – Bar, beam and truss element - Generation of Stiffness Matrix and Load Vector.

UNIT IV

Finite Element Analysis of Two Dimensional Problems:

Two Dimensional problems – Plane Stress, Plane Strain Problems – Triangular and Quadrilateral Elements – Isoperimetric Formulation - Natural Coordinates, Shape function, stiffness matrix

UNIT V

Introduction to Software:

Introduction to structural analysis Software (STAD Pro). Analysis of beams, plane and space trusses, plane and space frames. (Reaction, displacements)

Text Books:

1. Concepts and Application of Finite Element Applications, 4th Edition, R.D. Cook, D.S. Malkus, M.E. Plesha and R.J. Witt, John Wiley
2. J.N. Reddy, An Introduction to the Finite Element Method, McGraw Hill, International Edition, 1993.
3. Matrix Methods of Structural Analysis by S. S. Bhavikatti Paperback.

Reference Books:

1. S.S.Rao, "Finite Element Method in Engineering", Pergamon Press, 1989.
2. Chandrupatla & Belagundu, "Finite Elements in Engineering", Prentice Hall of India Private Ltd., 1997.
3. Matrix Analysis of Framed Structures by William Weaver, Jr. James M. Gere Paperback Second Edition.
4. C.S.krishnamoorthy, "Finite Element Analysis","Theory and Programming:, Tata McGrawHill, 1995
5. Matrix Methods of Structural Analysis by Dr. P. N.Godbole, R.S.Sonparote, S.U. Dhote. Eastern Economy Edition.

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Course Outcomes:

- Understand the fundamental concepts and theories of Matrix Methods for analysis of skeletal structures.
- Understand the fundamental concepts and theories of Finite Element Methods for analysis of continuum structures such as plane stress, plane strain.
- Competence in developing computer program for skeletal structures.

Assessment:

Assessment can vary from course to course and can include a combination of class work, tutorials, assignments, laboratory work, quizzes, surprise test, online test, project work and exams.

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Semester: VI **Branch: Civil Engineering**

Subject: Maintenance, Repair and Rehabilitation of Civil Engineering Structures (MRCS) **SOE-B-CE604(5)**

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Course Description

This course gives the knowledge of various methods of repairing and testing of various structures. Introduction to different methods of design of elements of RCC. And steel structures. This course gives also idea about Damage assessment and Evaluation ,Damage testing methods. It also emphasized on the safe, efficient and economical Maintenance, Repair and Rehabilitation of Civil Engineering Structures.

Course Objectives

This course should provide the students with good understanding in performance, rehabilitation in concrete structure.

Syllabus:

UNIT I

Performance of structures

Need for rehabilitation

Aging of structures

Distress in concrete steel structures

UNIT II

Damage assessment and Evaluation models

Damage testing methods – NDT, Core samples – Methods of repairs - Repair and maintenance of buildings

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UNIT III

IS standards - Bridge repairs - Seismic strengthening

UNIT IV

Rehabilitation methods - grouting – detailing

Imbalance of structural stability

UNIT V

Case Study1: Residential Building

Case Study 2: Industrial Building.

Text Books:

1. Repair and Rehabilitation of Concrete Structures by Poonam I. Modi. And Chirag N. Patel
2. Maintenance, Repair & Rehabilitation & Minor Works of Buildings by Varghese

Reference Books:

1. RN Raikar, "Diagnosis and treatment of Structures in Distress", R and D Centre, Structural Designers and Consultants, New Bombay, India,1994.

2. VK Raina, "Concrete Bridge Practice Construction, Maintenance and Rehabilitation", 2nd Edition, Shroff Publishers and Distributors, August, 2010.

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3. WH Ransom, "Building Failures, Diagnosis and Avoidance", 2nd Edition, E and F.N. Spon Publishers, December 1987.

Course Outcomes:

After the completion of this course the participants would gain the knowledge of various methods of repairing and testing of various structures.

Assessment:

Assessment can vary from course to course and can include a combination of class work, tutorials, assignments, quizzes, surprise test, online test, project work and exams.

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Semester: VI **Branch: Civil Engineering**

Subject: Remote Sensing and GIS in Civil Engineering **Code: SOE-B-CE605(6)**

Course Description

This course illustrates the fundamental concepts of GIS and remote sensing technologies in the context of environmental engineering. Topics include the physical basis for remote sensing, remote sensing systems, digital image processing, data structures, database design, and spatial data analysis.

Course Objectives

To learn in depth about GIS and Remote sensing & its Applications in Civil Engineering.

Syllabus:

UNIT I

Basic Concept of GIS: Introduction, Information systems, spatial and non-spatial information,Geographical concepts and terminology, Advantages of GIS, Basic components of GIS, Organization of data in GIS, Hardware & Software.

UNIT II

GIS Data: Input data, Field data, Statistical data, Maps, Aerial photographs, Satellite data, Points, lines and areas features, Vector and Raster data, Advantages and Disadvantages, Data entry through keyboard, digitizers and scanners, Digital data, GIS data formats and standards, Data Management, Data Base Management System (DBMS), various data Models, Run – length encoding, Quadtrees, Data Analysis – Data layers, analysis of spatial and non-spatial data, Data overlay and modelling, smart features of DBMS.

UNIT III

Applications of GIS: Applications of GIS in Map Revision, Landuse, Agriculture, Forestry,Archaeology, Municipal, Geology, Water Resources, Soil Erosion, Land suitability analysis, Change detection.

UNIT IV

Fundamentals of Remote Sensing: Concept of Remote Sensing, Principal of Remote Sensing, Components of Remote Sensing, Seven Elements in Remote Sensing, Characteristics of Electromagnetic Radiation.

UNIT V

Platforms Ground: Based Platforms, Aerial Platforms, Satellite Platforms, Types of Remote Sensing, Passive Remote Sensing, Active Remote Sensing, Thermal Infrared Remote Sensing, Elements of Visual Interpretation, Digital Image Processing, Remote Sensing in India.

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Text Books:

1. Satheesh,G. Sathikumar,R. and Madhu,N.(2007).Advanced Surveying,PEARSON Education, South Asia.

Reference Books:

1. Campbell, J.B.(1986).Introduction to Remote Sensing.The Guilford Press, London.
2. Horwood,E.(1992).Remote Sensing and Geographic Information Systems.The Guilford Press, London,

Course Outcomes:

Students will be able to understand:

1. To know the importance and areas of application of GIS.
2. Use GIS to identify, explore, understand, and solve spatial problems c.
3. Demonstrate GIS modeling skills d. Demonstrate critical thinking skills in solving geospatial problems.
4. Design and implement a GIS project.

Assessment:

Assessment will be based on a combination of attendance, class work, tutorials, assignments and exams.

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Semester: VI **Branch: Civil Engineering**

Subject: Urban Infrastructure **Code: SOE-B-CE605(7)**

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Course Description

This course is designed to provide a comprehensive understanding of physical and organisational structures needed for the operation of an urban area, as well as the services and facilities necessary for society and the economy to function. Also to orient students to the basic planning concept that governs the infrastructure need in urban area, new township and SEZ Development.

Course Objectives

The students should be able -

- To understand urban infrastructure and it's planning.
- To understand about town planning
- To understand concept of SEZs
- To know the government guidelines to run SEZs

Syllabus:

UNIT I:

Urban Infrastructure: Understanding of different types of urban infrastructures in planning, layout of service lines and interface.

Unit II:

Planning: Urban infrastructure in India; Planning for urban Infrastructure; scope of infrastructure services; Services provided in the city; Infrastructure Service planning.

Unit III

Urban Environment: Social infrastructure; disaster management; Land Pooling and Land banking.

Unit IV:

Township Principles and Town planning: Growth of towns, Stages in town development, current trends in township project, planning of township, requirement of new town, master plan, survey, neighbourhood planning, public utility in services existing town.

Unit-V:

SEZ: About SEZ, Legislative policies, setting up of SEZs, Routine operation of SEZ, Tax incentives, Infrastructure requirements for SEZ.

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Text Books:

1. Chaturvedi, T, (2007), Guide to special Economic Zones, Commercial Law Publisher
2. Gupta K (2008), Law and Procedure, Township, Atlantis Publisher
3. Osborn, F.J. Whittick A. (1969), The New town, The answer to megalopolis, Leonard Hill

Reference Books:

1. Indian Infrastructure report 2009, Land as a resource.
2. Municipal and Rural Sanitation / EHBEN, V M
3. Solid Liquid flow Slurry pipeline Transportation / WASPE, E J

Course Outcomes:

- Students are expected to understand planning of urban infra structures.
- Students are expected to understand concept o town planning and urban infrastructure
- Students are expected to understand concept of SEZs.
- Students are expected to understand services in Urban Infrastructure.

Assessment:

Assessment can vary from course to course and can include a combination of class work, tutorials, assignments, laboratory work, quizzes, surprise test, online test, project work and exams.

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Semester: VI **Branch: Civil Engineering**

Subject: Town Planning **Code: SOE-B-CE605(8)**

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Course Description

This course gives Introduction to Goals and Objectives of planning; components of planning; benefits of planning, Levels of planning: Regional plan , Development Plan, Town Planning Scheme, Neighborhood plan ,Types of Development plans, Master Plan, City Development Plan, Structure Plan, Special townships, Land Acquisition Rehabilitation and Resettlement Act

Course Objectives

- To know about Role of "Urban Planner and Architect" in planning and designing in relation with spatial organization, utility, demand of the area and supply
- To know about Traffic transportation systems
- To know about the different methods of design and the advantages of limit state design over other methods.
- Principles and elements of Architectural Composition.
- To understand the Special townships, Land Acquisition Rehabilitation and Resettlement

Syllabus:

UNIT I:

Architectural Elements: Principles and elements of Architectural Composition, Qualities of Architecture: user friendly, contextual, ecofriendly, utility of spaces, future growth etc. Role of "Urban Planner and Architect" in planning and designing in relation with spatial organization, utility, demand of the area and supply

UNIT II:

Landscaping: importance, objectives, principles, elements, material (soft and hard),
Urban renewal for quality of life and livability. Importance of sustainable architecture with case study

UNIT III:

Goals and Objectives of planning; components of planning; benefits of planning, Levels of planning: Regional plan, Development Plan, Town Planning Scheme, Neighborhood plan; Types of Development plans: Master Plan, City Development Plan, and Structure Plan

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UNIT IV:

Various types of civic surveys for DP: demographic, housing, land use, Water Supply & sanitation, etc., planning agencies for various levels of planning. Their organization and purpose (CIDCO-MHADA-MIDC, MMRDA/ PMRDA etc). Traffic transportation systems: urban road, hierarchy, traffic management, Intelligent Transport Systems.

UNIT V:

Legislative mechanism for preparation of DP: MRTP Act 1966, UDPFI guidelines (for land use, infrastructure etc),SEZ, CRZ, Smart City Guidelines, Special townships, Land Acquisition Rehabilitation and Resettlement Act 2013, Application of GIS, GPS, remote sensing in planning.

Text Books:

1. Town Planning By G K Hiraskar --Town Planning By S Rangwala
2. Building Drawing and Built Environment- 5 Th Edition – Shah , Kale , Patki ---Planning Legislation By Koperdekar And Diwan.
3. G. K. Bandopadhyaya , "Text Book of Town Planning".
4. Climate Responsive Architecture – Arvind Krishnan.
5. Introduction To Landscape Architecture By Michael Laurie

Reference Books:

1. MRTP Act 1966
2. Manual Of Tropical Housing And Building By Koenigsbeger
3. Sustainable Building Design Manual
4. UDPFI Guidelines
5. "The Urban Pattern: City planning and design" by Gallion and Eisner.
6. Design of cities by Edmond bacon
7. LARR Act 2013
8. MoUD By GoI
9. NRSA

Course Outcomes:

- To develop a planning; components of planning; benefits of planning, Levels of planning: Regional plan, Development Plan, Town Planning Scheme, Neighborhood plan, Types of Development plans, Master Plan, City Development Plan, Structure Plan. Special townships, Land Acquisition Rehabilitation and Resettlement Act
- To understand the basis of economical and safe Town planning.
- To develop ability of choosing proper Development plans.
- To make use of knowledge of analysis in structural planning and design of various components of buildings.

Assessment:

Assessment can vary from course to course and can include a combination of class work, tutorials, assignments, quizzes, surprise test, online test, project work and exams.

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Semester: VI **Branch: Civil Engineering**

Subject: Systems Approach in Civil Engineering **Code: SOE-B-CE605(9)**

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Course Description

This course deals with the extremely important topics under the broad umbrella of optimization. This is synonymous with efficiency which is the underlying prime rationale for all scientific and technological advances and progress

Course Objectives

1. This module aims to introduce students to use quantitive methods and techniques for effective decisions–making.
2. model formulation and applications that are used in solving business decision problems

Syllabus:

UNIT I

Introduction: a) Introduction to system approach, Operations Research and Optimization Techniques and their application in Civil Engineering.

b) Introduction to Linear and Non-Linear Programming methods, Graphical Solutions to Linear Programming.

c)Various models, Objective function and constraints, convex and concave functions, regions, and sets.

UNIT II

Linear programming a): Formulation of Linear optimization models for Civil engineering applications.

Linear programming b): The simplex method, special cases in simplex method, Method of Big M, Two-phase method, duality, and sensitivity analysis.

Linear programming c): The Transportation Model and its variants, Assignment Model, and its variants.

UNIT III

Non-Linear programming a): Single variable unconstrained optimization –Local & Global optima, uni-modal function.

Non-Linear programming b): Queuing Theory.

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UNIT IV

Sequencing model, Simulation- Monte Carlo Simulation, Games theory.

UNIT V

Dynamic programming: Multi-stage decision processes, Principle of optimality, recursive equation, Applications, various models of D.P.

Text Books:

1. Engineering Optimization: Theory and Practice, S. S. Rao, 2013, New age International Publisher, Third Edition.
2. Quantitative Techniques in Management, N.D. Vohra, 2017, McGraw Hill, Fifth Edition.

References:

1. Operations Research, Hamdy A. Taha, 2019, Pearson, Tenth Edition.
2. Topics in Management Science, Robert E. Markland, 1989, Wiley Publication, Third Edition.
3. System Approach to Civil Engineering Planning & Design, Thomas K. Jewell, 1986, Harper Row Publishers.

Course Outcomes:

Students will be able to understand:

1. The characteristics of different types of decision-making environments and the appropriate decision-making approaches and tools to be used in each type.
2. Transportation Models and Assignment Models.
3. New simple models, like CPM, MSPT to improve decision–making and develop critical thinking and objective analysis of decision problems.

Assessment:

Assessment will be based on a combination of attendance, classwork, tutorials, assignments, and exams.

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Semester: VI **Branch: Civil Engineering**
Subject: Structural Engineering Design-II Lab **Code: SOE-B-CE606**

Course Description

Structural Engineering Design–II Lab emphasized on the safe, efficient and economical design of some major elements of the infrastructure which are made up of steel and RCC material.

This course gives Introduction to different methods of design of elements of steel and RCC structure, principally aimed to introduce the students about various elements of steel and RCC structure and their behaviour under applied load. It makes student aware about the concepts of selection of cross section to transmit design load without risk of failure.

Course Objectives

To acquire hands on experience in design and preparation of structural drawings for concrete / steel structures normally encountered in Civil Engineering practice.

List of Experiments to be performed:

By using latest version of a Standard Structural Engineering Design Package such as STAAD Pro.

RCC DESIGN:

1. Introduction
2. Geometrical Modelling of RCC
3. Modelling of loads and load combinations on RCC Frame
4. Analysis and Interpretation of Results of Analysis of RCC Frame
5. Design of RCC Frame
6. Interpretation of Results of Design of RCC Frame

STEEL DESIGN:

1. Geometrical Modelling of Steel Frame
2. Modelling of loads and load combinations on Steel Frame
3. Analysis and Interpretation of Results of Analysis of Steel Frame

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4. Design of Steel Frame

5. Interpretation of Results of Design of Steel Frame

CASE STUDY:

1. Case Study of design of a RCC Multistorey Building

2. Case Study of design of a Steel Industrial Building

List of Equipments / Machine Required:

1. Latest Release of Software Package STAAD Pro (Research Engineers International. Kolkata)

2. Latest Release of Software Package STAAD.etc (Research Engineers International. Kolkata)

Recommended Books:

1. Reference Manual for Respective Software

2. Verification Manual of Respective Software

Course Outcomes:

- To develop ability to select adequate shape and grade of structural steel.
- To understand the basis of economical and safe design of steel structures.
- To develop ability of choosing proper fastener for a particular joint.
- To Make use of knowledge of analysis in structural planning and design of various components of buildings.

Assessment:

Assessment include a combination of attendance, class work, tutorials, assignments, laboratory work, surprise test, online test, and exams.

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Semester: VI **Branch: Civil Engineering**

Subject: Geotechnical Engineering Lab - I I **Code: SOE-B-CE607**

Course Description

Geotechnical laboratory is to determine engineering properties of soil which are required for suitable design of foundations for any structure. The engineering properties include consolidation, compressibility, shear strength and bearing capacity of soil. By evaluating the properties of soil in the laboratory, students will be able to relate the concepts studied in the relevant theory course. Also students can utilize the knowledge of both theory and practical in the field application to real problems. In this laboratory both laboratory and in-situ experiments can be conducted. This laboratory course will help the students to understand the theoretical concepts learned in the course Geotechnical Engineering.

Course Objectives

The objective of the course is to conduct the various testing on soils and evaluate their engineering characteristics by laboratory procedures.

List of Experiments:

1. Direct shear Test on the
   (i) Dry cohesionless /cohesion soil specimen remoulded/unremoulded.
   (ii) Direct shear Test-undained test, direct shear test –consolidated undrained .
2. Determination of Unconfined compression Strength of cohesive soils (Remoulded/ Unremoulded).
3. Triaxial compression Test (Triaxial compression Test) (i) UU, (ii) CU, (iii), CC.
4. Laboratory Vane Shear Test (remoulded /unremoulded).
5. Study of standard penetration.
6. Determination of coefficient of consolidation by consolidation test.
7. Determination of bearing capacity of soil by plate load.
8. Field identification test.
9. Soil sampling.
10. Determination of swelling pressure of purely cohesive soil (remoulded /unremoulded specimen).
11. Determination of density index (relative density) of cohesion less soils.

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Recommended Books:

1. Respective Bureau of Indian Standard/ International Standard Codes of Practices.
2. Bowles, J.E. (2012). Engineering Properties of Soil and their Measurement, 4th Edition, McGraw Hill (India) Publishers.
3. Mandal, J.N. and Divshikar, D.G. (1994). Soil Testing in Civil Engineering, Oxford & IBH Publishing Company Pvt. Ltd., New Delhi, India.
4. Sivakugan, N., Arulrajah, A. and Bo, M.W. (2011). Laboratory Testing of Soils, Rocks and Aggregates,

Course Outcomes:

Be able to plan and implement a site investigation program including subsurface exploration to evaluate soil/structure behavior and to obtain the necessary design parameters.

Assessment:

Assessment includes attendance, performance, record work and exams.

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Semester : VI **Branch: Civil Engineering**
Subject: Environmental Engineering -I Lab **Code: SOE-B-CE608**

Course Objectives:

To understand the sampling, preservation methods and significance of characterization of water
List of Experiments
(At least ten experiments are to be performed by every student)

1. Determination of pH and Turbidity of water sample.
2. Determination of Acidity and Alkalinity of water sample.
3. Determination of Chloride Content of water sample
4. Determination of Hardness of water sample.
5. Determination of DO Content of water sample.
6. Determination of Optimum Coagulant dose of water sample.
7. Determination of Total Solids in water sample.
8. Determination of COD in water sample
9. Determination of BOD of water sample
10. Determination of Fluoride content in water sample.
11. Determination of Nitrates in water sample.
12. Determination of air quality of nearby area.
13. Determination of noise level of the selected area.
14. Field visit of water treatment plant of a nearby area.

Recommended Books:
1. Garg, S.K. 'Environmental Engineering', Vol. I , Khanna Publications, New Delhi.

Course Outcomes:
The students completing the course will be able to characterize water and conduct experiments by preparing reagents for the test.

Assessment:
Assessment includes attendance, performance, record work and exams.

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Semester : VI	Branch: Civil Engineering
Subject: Professional Development (Employability Skills-I)	Code: SOE-B-CE609

COURSE DESCRIPTION:

Employability is a course for engineering students, designed to develop the knowledge and skills necessary to prepare for the career development. Knowledge of the factors involved in these roles is vital for preparing students to make informed and competent decisions regarding career and family life. This course focuses on the development of the transferable skills students need in job and life situation tasks. These skills include: basic academic skills, thinking skills, personal qualities, use of resources, interpersonal skills and using information.

COURSE OBJECTIVES

The objectives of this course are:

- Analyzing interest, aptitudes and skills to make informed career goals.
- Using job shadowing to research careers of interest and identify career preferences.
- Demonstrating job seeking and job keeping skills to gain immediate or future employment.
- Identify entrepreneurial characteristics and skills.

COURSE CONTENT

UNIT-I. Career Exploration

a. Career Clusters
b. Interest Inventory-Career Cruising
c. Career Cruising – My Portfolio

UNIT-II. Finding a Job

a. Job Sources
b. Networking and Personal Contacts
c. Entrepreneurship

UNIT-III. Job Search Skills

a. Resume Writing
b. Letter of Application
c. Job applications d. Interviews e. Professional Dress

UNIT-IV. Employer/Employee Relationships

a. Communication skills b. Transferable work skills
c. Positive work skills
d. Conflict resolution

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e. Workplace legal issues
f. Work ethic

UNIT-V. Small Business

a. Small business types
b. Entrepreneurship
c. Business plan

COURSE OUTCOME

After completion of the course, students will be able to:

- explore their values and career choices through individual skill assessments
- to make realistic employment choices and to identify the steps necessary to achieve a goal
- to develop and practice self-management skills for the work site
- to explore and practice basic communication skills
- to learn skills for discussing and resolving problems on the work site
- to assess and improve personal grooming
- to promote safety awareness including rules and procedures on the work site.

RECOMMENDED TEXT & REFERENCE BOOKS

- "Soft Skills" by Hariharan S. , S. N.Sundararajan, and S.P.Shanmugapriya, Mjp Publishers
- "Soft Skills: Know Yourself and Know the World" by Alex
- 3. "Making Work Work for the Highly Sensitive Person" by Beverly Jaeger, McGraw-Hill Education
- 4. "Enhancing Soft Skills" by Dipali Biswas, Shroff; First edition
- " Soft Skills – Enhancing Employability: Connecting Campus with Corporate " by M. S. Rao, I K International Publishing House Pvt. Ltd
- " Enhancing Employability @ Soft Skills " by Shalini Verma, Pearson Education; First edition
- "Get your First Job: A companion for getting your first job – A Guide to Employability Skills and Career Planning " by A J Balasubramanian and Dr J Sadakkadulla, Amazon Asia-Pacific Holdings Private Limited
- " Soft Skills at Work: Technology for Career Success " by Beverly Amer, Course Technology Inc
- " BEST: Basic Employability Skills Training: Volume 1 " by Sally J. Vonada and JoAnn Brunner, CreateSpace Independent Publishing Platform
- " Personal Transferable Skills in Accounting Education RPD " by Kim Watty and Beverley Jackling, Routledge; 1 edition
- "How to develop a pleasing personality" by Atul John Rego, Better yourself bools, Mumbai,2006

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ASSESSMENT PLAN

The assessment of Employability Skills-I course will be done in two parts (Components). Following table shows the weightage of respective components of assessment:

S. No.	Component	Weightage (%)
1	Assignment & Test	**15**
3	End Semester Examination	**10**
	Total Marks	**25**

1. **Assignment & Test:** Two assignments and one test

2. **End Semester Examination:** The End Semester Examination will be held normally after completion of teaching. The End Semester Examination will be of three hours duration and the question paper will consist of three sections. The details are shown in the following table:

S. No.	Section	Description	Time Allowed	Weightage (%)
1	**A**	10 Multiple Choice Questions	30 Minutes	**20**
2	**B**	Short Response Questions (All Compulsory)	2 Hours 30 Minutes	**40**
3	**C**	Three Extended Response Questions from a choice of Four questions		**40**

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Semester : VI
Subject: Microsoft Project (MS Project)

Branch: Civil Engineering
Code: SOE-B-CE610

Course Description

Microsoft Project 2019 is a project management application that gives managers the ability to track tasks, resources, reports and timelines for small and enterprise projects. Just one mistake during project management can destroy project budgets and deadlines. MS Project helps student avoid common pitfalls by giving a complete overview of every component of a project, and this course explains each one of these components to get started.

This course starts with basic project setup. A new Project file starts as a template, and the project manager must then fill out worksheets to define resources and tasks. This course takes you step-by-step through each part of configuring a new task and creating resources to work on those tasks. We then show you how to assign each resource to a task to ensure that it gets completed.

Course Objective:

The students should be able -

- To understand Project Management and Planning.
- To understand Microsoft Project.
- To understand Task, activity, linking.
- To know about the resources assigning and budgeting.

Syllabus

Unit 1:

Basics of Project Management: About Project, Project Attributes, Triple Constraints, Project Management, 5 Stages of Project, Project Life Cycle, Scheduling, Linking, Baseline setup, Logical Relationship of task, Activities listing. Milestone, Work Break Down structure, Float, Forward Pass, Backward Pass, Gantt chart, Network Diagram, Critical Path Method, PERT, Project Monitoring, Project Tracking, S-Curve Analysis.

Unit 2:

Introduction to MS Project: Background, Getting Started in MS Project 2019. Defining and Creating Projects, Entering and Scheduling Tasks, Project 2019 Views, Defining Calendar.

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Unit 3:

Defining Activities and Task: Organizing Tasks, Working with Task Duration, Constraints, and Deadlines, Introducing Dependencies, Logical Relationship setup, Assigning Durations, Actual Start, Schedule Task.

Unit 4:

Resources and Tracking: Types of Resources, Working with Resources, Resource Management, Tracking Work in Project 2019, Communication and Progress Updates, Using Baselines,

Unit 5:

Reports: Customizing and Formatting Your Project, Running Reports, Consolidating Projects and Resources, Printing Project Information

Course Materials

All course material will be provided in the lessons and net links. There are no required materials to purchase before taking the class.

Course Outcomes

By successfully completing this course, students will be able to:

- Describe what MS Project is and what are its capabilities.
- Demonstrate defining and creating projects
- Demonstrate entering and scheduling tasks
- Describe calendar and how to organize tasks
- Define resources and resource management
- Demonstrate consolidating projects and resources

Assessment:

Assessment can vary from course to course and can include a combination of class work, tutorials, assignments, quizzes, surprise test, online test, project work and exams.

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