

**SYLLABUS FOR
MANDATORY
ENVIRONMENTAL AND
PROFESSIONAL ETHICS
COURSES**

| Course Title: WATER RESOURCES MANAGEMENT [As per Choice Based Credit System (CBCS) scheme] SEMESTER:VI | | | |
|---|----------------|------------------------|-----------|
| Subject Code | 17CV661 | IA Marks | 40 |
| Number of Lecture Hours/Week | 03 | Exam Marks | 60 |
| Total Number of Lecture Hours | 40 | Exam Hours | 03 |
| CREDITS – 03 | | Total Marks-100 | |
| Course objectives: This course will enable students to; <ol style="list-style-type: none"> 1. Judge surface and ground water resources. 2. Address the issues of water resources management. 3. Learn the principles of integrated water resources management. 4. Understand the legal framework of water policy. 5. Know the different methods of water harvesting. | | | |
| Module -1 | | | |
| Surface and Ground water Resources: Hydrologic Cycle, Global water resources and Indian Water resources, Surface Water Resources, Water Balance, Available Renewable Water Resources, Water Scarcity, The Water Balance as a Result of Human Interference, Groundwater Resources, Types of Aquifers, Groundwater as a Storage Medium | | | |
| L2, L3 | | | |
| Module -2 | | | |
| Water Resources Planning and Management: Necessity, System components, planning scales, Approaches, planning and management aspects, Analysis, Models for impact prediction and evaluation, Adaptive Integrated Policies, Post Planning and management Issues. | | | |
| L2, L3 | | | |
| Module -3 | | | |
| Integrated Water Resources Management: Definition of IWRM, Principles, Implementation of IWRM, Legislative and Organizational Framework, Types and Forms of Private Sector Involvement. | | | |
| L3, L4 | | | |
| Module -4 | | | |
| Water Governance and Water Policy: Legal Framework of Water – Substance of National Water Laws – Other key issues – Changing incentives through Regulation - National Water Policy – National-Level Commissions – Irrigation Management Transfer Policies and Activities – Legal Registration of WUAs – Legal Changes in Water Allocation, – Role of Local Institutions – Community Based Organizations – Water Policy Reforms: India. | | | |
| L2, L3 | | | |
| Module -5 | | | |
| Water Harvesting and Conservation: Water Harvesting Techniques – Micro-catchments - Design of Small Water Harvesting Structures – Farm Ponds – Percolation Tanks – Yield from a Catchment, Rain water Harvesting-various techniques related to Rural and Urban area. | | | |
| L2, L3 | | | |
| Course outcomes: After studying this course, students will be able to: <ol style="list-style-type: none"> 1. Assess the potential of groundwater and surface water resources. 2. Address the issues related to planning and management of water resources. 3. Know how to implement IWRM in different regions. | | | |


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4. Understand the legal issues of water policy.
5. Select the method for water harvesting based on the area.

Program Objectives:

- Engineering knowledge
- Problem analysis
- Interpretation of data

Text Books:

1. K. Subramanya, "Engineering Hydrology", Tata McGraw Hill Publishers, New Delhi.
2. H.M. Raghunath, "Ground Water", Wiley Eastern Publication, New Delhi.
3. Daniel P. Loucks and Eelco van Beek, "Water Resources Systems. Planning and Management", UNESCO Publication.
4. Mollinga, P. et al, "Integrated Water Resources Management", Water in South Asia Volume I, Sage Publications, 2006.
5. Singh, Chhatrapati "Water Rights in India," Ed: Chhatrapati Singh. Water Law in India: The Indian Law Institute, New Delhi, 1992.
6. Dhruva Narayana, G. Sastry, V. S. Patnaik, "Watershed Management", CSWCTRI, Dehradun, ICAR Publications, 1997.

Reference Books:

1. Lal, Ruttan. "Integrated Watershed Management in the Global Ecosystem". CRC Press, New York.
2. Heathcote, I. W. Integrated Watershed Management: Principles and Practice. 1988. John Wiley and Sons, Inc., New York.


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| Course Title: WATER SUPPLY AND TREATMENT ENGINEERING As per Choice Based Credit System (CBCS) scheme] | | | |
|--|--------|------------------|----|
| SEMESTER:VI | | | |
| Subject Code | 17CV64 | IA Marks | 40 |
| Number of Lecture Hours/Week | 04 | Exam Marks | 60 |
| Total Number of Lecture Hours | 50 | Exam Hours | 03 |
| CREDITS -04 | | Total Marks- 100 | |
| Course objectives: This course will enable students to | | | |
| 1. Analyze the variation of water demand and to estimate water requirement for a community. | | | |
| 2. Evaluate the sources and conveyance systems for raw and treated water. | | | |
| 3. Study drinking water quality standards and to illustrate qualitative analysis of water. | | | |
| 4. Design physical, chemical and biological treatment methods to ensure safe and potable water Supply. | | | |
| Module -1 | | | |
| Introduction: Need for protected water supply. Demand of Water: Types of water demands -domestic demand, industrial, institutional and commercial, public use, fire demand, Factors affecting per capita demand, Variations in demand of water, Peak factor, Design period and factors governing design period. | | | |
| Different methods of population forecasting -with merits and demerits. Numerical Problems. | | | |
| L1,L2,L3 | | | |
| Module -2 | | | |
| Water Treatment: Objectives, Treatment flow chart – significance of each unit | | | |
| Sources and Characteristics: surface and subsurface sources -suitability with regard to quality and quantity. Sampling - Objectives, methods, Preservation techniques. | | | |
| Water quality characteristics: Physical, Chemical and Microbiological. | | | |
| L1,L2,L3 | | | |
| Module -3 | | | |
| Sedimentation -theory, settling tanks, types, design. Concept of Plate and Tube settlers. | | | |
| Coagulation aided sedimentation-types of coagulants, chemical feeding, flash mixing, Clariflocculators . Filtration: mechanism -theory of filtration, types of filters, slow sand, rapid sand and pressure filters including construction, operation, cleaning. Operational problems in filters. Design of slow and rapid sand filter without under drainage system. | | | |
| Ultra and micro filtration: Basic principles, membrane materials, pore size, flux, normalizing permeability, fouling mechanism, Overview of ultra and micro filtration elements and systems, Fouling in MF/UF systems, fouling control and pre treatment. | | | |
| L1,L2,L3 | | | |
| Module -4 | | | |
| Softening: Overview of Lime soda, Zeolite process, RO and Nano filtration: Basic principles, Flux, Salt passage, rejection and concentration polarization. Overview of RO and nano filtration membranes and elements, Conventional pre treatment techniques for RO and nano filtration. | | | |
| Disinfection: Methods of disinfection with merits and demerits, Theory of disinfection, emphasis on treatment of water for community bathing. (melas and fairs) Fluoridation and De-fluoridation. | | | |
| L1,L2,L3 | | | |
| Module -5 | | | |
| Collection and Conveyance of water: Intake structures - types of intakes –Factors to be considered in selection of intake structures. | | | |
| Pumps: Types of pumps with working principles. Numerical Problems. | | | |
| Pipes: Design of the economical diameter for the rising main; Numerical Problems. | | | |
| Pipe appurtenances, Valves, Fire hydrants | | | |
| Pipe materials: Different materials with advantages and disadvantages. Factors affecting selection of pipe material. | | | |
| Distribution system: Methods- Gravity, Pumping, Combined gravity and pumping system, Service reservoirs and their capacity determination. | | | |

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Visit to Intake structure, Water treatment plant and report working of each unit
Design of water treatment plant units and distribution system with population forecasting for the given city

L1,L2,L3

Course Outcomes: After studying this course, students will be able to:

1. Estimate average and peak water demand for a community.
2. Evaluate available sources of water, quantitatively and qualitatively and make appropriate choice for a community.
3. Evaluate water quality and environmental significance of various parameters and plan suitable treatment system.
4. Design a comprehensive water treatment and distribution system to purify and distribute water to the required quality standards.

Program Objectives:

- Engineering knowledge
- Problem analysis
- Interpretation of data

Text Books:

1. S.K.Garg, Environmental Engineering vol-I, Water supply Engineering – M/s Khanna Publishers, New Delhi 2010
2. Mark.J Hammer, Water & Waste Water Technology, John Wiley & Sons Inc., New York, 2008.

Reference Books:

1. B.C. Punmia and Ashok Jain, Environmental Engineering I-Water Supply Engineering, Laxmi Publications (P)Ltd., New Delhi 2010.
2. Howard S. Peavy, Donald R. Rowe, George T , Environmental Engineering - McGraw Hill International Edition. New York, 2000
3. CPHEEO Manual on water supply and treatment engineering, Ministry of Urban Development, Government of India, New Delhi.


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VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELGAUM
CHOICE BASED CREDIT SYSTEM (CBCS)
CIVIL ENGINEERING BOARD
BE-CBCS SYLLABUS 2017-18 Scheme

| | | | |
|--|---------------------------------|-------------------|-----------|
| TITLE OF THE COURSE: STRENGTH OF MATERIALS B.E., III Semester, Civil Engineering [As per Choice Based Credit System (CBCS) scheme] | | | |
| Course Code | 17 CV32 | CIE Marks | 40 |
| Number of Lecture Hours/Week | 04 | SEE Marks | 60 |
| Total Number of Lecture Hours | 50 (10 Hours per Module) | Exam Hours | 03 |
| Credits – 04 | | | |
| Course Objectives: This course will enable students; | | | |
| <ol style="list-style-type: none"> 1. To understand the basic concepts of the stresses and strains for different materials and strength of structural elements. 2. To know the development of internal forces and resistance mechanism for one dimensional and two dimensional structural elements. 3. To analyse and understand different internal forces and stresses induced due to representative loads on structural elements. 4. To analyse and understand principal stresses due to the combination of two dimensional stresses on an element and failure mechanisms in materials. 5. To evaluate the behavior of torsional members, columns and struts. | | | |
| Module-1 | | | |
| Simple Stresses and Strain: | | | |
| Introduction, Definition and concept and of stress and strain. Hooke's law, Stress-Strain diagrams for ferrous and non-ferrous materials, factor of safety, Elongation of tapering bars of circular and rectangular cross sections, Elongation due to self weight. Saint Venant's principle, Compound bars, Temperature stresses, Compound section subjected to temperature stresses, state of simple shear, Elastic constants and their relationship. | | | |
| L1, L2 | | | |
| Module-2 | | | |
| Compound Stresses: Introduction, state of stress at a point, General two dimensional stress system, Principal stresses and principal planes. Mohr's circle of stresses | | | |
| Thin and Thick Cylinders: Introduction, Thin cylinders subjected to internal pressure; Hoop stresses, Longitudinal stress and change in volume. Thick cylinders subjected to both internal and external pressure; Lamé's equation, radial and hoop stress distribution. | | | |
| L2, L4 | | | |

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|--|----------|
| Module-3 | |
| Shear Force and Bending Moment in Beams: Introduction to types of beams, supports and loadings. Definition of bending moment and shear force, Sign conventions, relationship between load intensity, bending moment and shear force. Shear force and bending moment diagrams for statically determinate beams subjected to points load, uniformly distributed loads, uniformly varying loads, couple and their combinations. | |
| | L2,L4 |
| Module-4 | |
| Torsion in Circular Shaft: Introduction, pure torsion, Assumptions, derivation of torsion equation for circular shafts, torsional rigidity and polar modulus Power transmitted by a shaft, combined bending and torsion. | |
| Theories of Failure: Introduction, maximum principal stress theory (Rankine's theory), Maximum shearing stress theory (Tresca's theory), Strain energy theory (Beltrami and Haigh), and maximum strain theory (St. Venant's theory). | |
| | L2 ,L4 |
| Module-5 | |
| Bending and Shear Stresses in Beams: Introduction, pure bending theory, Assumptions, derivation of bending equation, modulus of rupture, section modulus, flexural rigidity. Expression for transverse shear stress in beams, Bending and shear stress distribution diagrams for circular, rectangular, 'I', and 'T' sections. Shear centre(only concept) | |
| Columns and Struts: Introduction, short and long columns. Euler's theory; Assumptions, Derivation for Euler's Buckling load for different end conditions, Limitations of Euler's theory. Rankine-Gordon's formula for columns. | |
| | L1,L2,L4 |
| Course outcomes: After studying this course, students will be able; | |
| <ol style="list-style-type: none"> 1. To evaluate the strength of various structural elements internal forces such as compression, tension, shear, bending and torsion. 2. To suggest suitable material from among the available in the field of construction and manufacturing. 3. To evaluate the behavior and strength of structural elements under the action of compound stresses and thus understand failure concepts 4. To understand the basic concept of analysis and design of members subjected to torsion. 5. To understand the basic concept of analysis and design of structural elements such as columns and struts. | |
| Text Books: | |
| <ol style="list-style-type: none"> 1. B.S. Basavarajaiah, P.Mahadevappa "Strength of Materials" in SI Units, University Press (India) Pvt. Ltd., 3rd Edition, 2010 2. Ferdinand P. Beer, E. Russell Johnston and Jr. John T. DeWolf "Mechanics of Materials", Tata McGraw-Hill, Third Edition, SI Units | |

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Reference Books:

1. D.H. Young, S.P. Timoshenko " Elements of Strength of Materials" East West Press Pvt. Ltd., 5th Edition (Reprint 2014)
2. R K Bansal, "A Textbook of Strength of Materials", 4th Edition, Laxmi Publications, 2010
3. S.S. Rattan " Strength of Materials" McGraw Hill Education (India) Pvt. Ltd., 2nd Edition (Sixth reprint 2013)
4. Vazirani, V N, Ratwani M M. and S K Duggal "Analysis of Structures Vol. I", 17th Edition, Khanna Publishers, New Delhi.


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Course Title: MUNICIPAL AND INDUSTRIAL WASTE WATER ENGINEERING**As per Choice Based Credit System (CBCS) scheme]****SEMESTER:VII**

| | | | |
|--------------------------------------|---------------|-------------------------|-----------|
| Subject Code | 17CV71 | IA Marks | 40 |
| Number of Lecture Hours/Week | 04 | Exam Marks | 60 |
| Total Number of Lecture Hours | 50 | Exam Hours | 03 |
| CREDITS -04 | | Total Marks- 100 | |

Course objectives: This course will enable students to;

4. Understand sewerage network and influencing parameters.
5. Understand and design different unit operations involved in conventional and biological treatment process.
6. Apply the principles of Industrial effluent treatment process for different industrial wastes.
7. Evaluate self purification of streams depending on hydraulic and organic loading of sewage into receiving waters.

Module -1

Introduction, need for sanitation, methods of sewage disposal, types of sewerage systems, dry weather flow, wet weather flow, factors effecting dry and wet weather flow on design of sewerage system, estimation of storm flow, time of concentration flow, material of sewers, shape of sewers, laying and testing of sewers, ventilation of sewers. low-cost waste treatment; oxidation pond, septic tank, Sewer appurtenances, manholes, catch basins, basic principles of house drainage, typical layout plan showing house drainage connections,

L1,L2**Module -2**

Design of sewers, hydraulic formula for velocity, effects of variation on velocity, regime velocity, design of hydraulic elements for circular sewers for full flow and partial flow conditions, disposal of effluents by dilution, self purification phenomenon, oxygen sag curve, zones of purification, sewage farming, sewage sickness, numerical problems on disposal of effluents, Streeter-Phelps equation

L2,L3**Module -3**

Waste water characteristics, sampling, significance and techniques, physical, chemical and biological characteristics, flow diagram for municipal waste water treatment, unit operations; screens, grit chambers, skimming tanks, equalization tanks

Suspended growth and fixed film bio process, design of trickling filters, activated sludge process, sequential batch reactors, moving bed bio reactors, sludge digesters,

L1,L2,L3**Module -4**

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Difference between domestic and industrial waste water, effect of effluent discharge on streams, methods of industrial waste water treatment; volume reduction, strength reduction, neutralization, equalisation and proportioning. Removal of organic, inorganic and colloidal solids, combined treatment methods; merits, demerits and feasibility, principles of discharge of raw, partially treated and completely treated wastes in to streams

L1,L2

Module -5

Process flow chart, sources and characteristics of industrial waste water, treatment methods, reuse and recovery and disposal; cotton and textile industry, tanning industry, cane sugar and distilleries, dairy industry, steel and cement industry, paper and pulp industry, pharmaceutical and food processing industry.

L1,L2,L3

Course outcomes: After studying this course, students will be able to:

4. Acquires capability to design sewer and Sewerage treatment plant.
5. Evaluate degree of treatment and type of treatment for disposal, reuse and recycle.
6. Identify waste streams and design the industrial waste water treatment plant.
7. Manage sewage and industrial effluent issues.

Program Objectives:

- Engineering knowledge
- Problem analysis
- Interpretation of data

Text Books:

1. Metcalf and Eddy, "Wastewater Engineering - Collection, Treatment, Disposal and Reuse", McGraw Hill Pub.Co., 2009.
2. Nelson Leonard Nemerow, "Industrial Waste Treatment", Butterworth-Heinemann, 2007.
3. Patwardhan A.D, "Industrial Waste Water Treatment", PHI Learning Private Limited- New Delhi
4. Hammer, M.J. and Hammer, M.J., "Water and Wastewater Technology", 7th Ed., Prentice Hall of India

Reference Books:

1. Manual on Waste Water Treatment: CPHEEO, Ministry of Urban Development, New Delhi.
2. Fair, Geyer and Okun, "Water and Wastewater Engineering" Vol-II, John Willey Publishers, New York.


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| TITLE OF THE COURSE: ENGINEERING GEOLOGY B.E., III Semester, Civil Engineering [As per Choice Based Credit System (CBCS) scheme] | | | |
|---|--------------------------|------------|----|
| Course Code | 17 CV35 | CIE Marks | 40 |
| Number of Lecture Hours/Week | 04 | SEE Marks | 60 |
| Total Number of Lecture Hours | 50 (10 Hours per Module) | Exam Hours | 03 |
| Credits – 04 | | | |
| Course Objectives: This course will enable students; | | | |
| <ol style="list-style-type: none"> 1. To understand the internal structure and composition of the earth. 2. To comprehend the properties, occurrence and uses of minerals in various industries. 3. To learn about geo-morphological agents such as river, wind, sea waves, and their implications in implementing civil engineering projects. 4. To gain knowledge about the structures of the rocks and their considerations in the selection of site for dams, tunnels, bridges and highways. 5. To learn the application of Topographic maps, remote sensing and GIS in Civil engineering practices and natural resource management. | | | |
| Module-1 | | | |
| Introduction: Application of Earth Science in Civil Engineering Practices. Understanding the earth, internal structure and composition. | | | |
| Mineralogy: Mineral properties, composition and their use in the manufacture of construction materials – Quartz Group (Glass); Feldspar Group (Ceramic wares and Flooring tiles); Kaolin (Paper, paint and textile); Asbestos (AC sheets); Carbonate Group (Cement); Gypsum (POP, gypsum sheets, cement); Mica Group (Electrical industries); Ore minerals - Iron ores (Steel); Chromite (Alloy); Bauxite (aluminum); Chalcopyrite (copper) | | | |
| L1,L2 | | | |
| Module-2 | | | |
| Petrology: Formation, Classification and Engineering Properties. Rock as construction material, concrete aggregate, railway ballast, roofing, flooring, cladding and foundation. Deformation of rocks, Development of Joints, Folds, Faults and Unconformities. Their impact in the selection of sites for Dams, Reservoirs, Tunnels, Highways and Bridges, Rock Quality Determination (RQD), Rock Structure Rating (RSR), Igneous Rocks - Granite, Gabbro, Dolerite, Basalt; Sedimentary rocks - Sandstone, Shale, Limestone, Laterite; Metamorphic rocks - Gneiss, Quartzite, Slate, Charnockite: Decorative stones - Porphyries, Marble and Quartzite | | | |
| L2,L3. | | | |
| Module-3 | | | |
| Geomorphology and Seismology: Landforms – Classification, Rock weathering, types and its effects on Civil Engineering Projects. Study of Geo-morphological | | | |

aspects in the selection of sites for Dams, Reservoirs, Tunnels, Highways and Bridges. Watershed management, Floods and their control, River valley, Drainage pattern – parameters and development; Coastlines and their engineering considerations.

Earthquake - Causes and Effects,, Seismic waves, Engineering problems related to Earthquakes, Earthquake intensity, Richter Scale, Seismograph, Seismic zones- World and India, Tsunami – causes and effects. Early warning system. Reservoir Induced Seismicity; Landslides – causes and their control

L2, L3, L5.

Module-4

Hydrogeology: Hydrological cycle, Occurrence of Groundwater in different terrains -Weathered, Hard and Stratified rocks; Determination of Quality aspects - SAR, RSC and TH of Groundwater. Groundwater Pollution, Groundwater Exploration- Electrical Resistivity and Seismic methods, Resistivity curves, Water Bearing Formations, Aquifer types and parameters - Porosity, Specific yield and retention, Permeability, Transmissibility and Storage Coefficient. Springs and Artesian Wells, Artificial Recharging of Groundwater, Sea water intrusion and remedies.

L4,L5

Module-5

Geodesy: Study of Topographic maps and Contour maps; Remote Sensing – Concept, Application and its Limitations; Geographic Information System (GIS) and Global Positioning System (GPS) – Concept and their use resource mapping. LANDSAT Imagery-Definition and its use. Impact of Mining, Quarrying and Reservoirs on Environment. Natural Disasters and their mitigation.

L2,L3, L5

Course outcomes: After a successful completion of the course, the student will be able to:

1. Students will able to apply the knowledge of geology and its role in Civil Engineering
2. Students will effectively utilize earth's materials such as mineral, rocks and water in civil engineering practices.
3. Analyze the natural disasters and their mitigation.
4. Assess various structural features and geological tools in ground water exploration, Natural resource estimation and solving civil engineering problems.
5. Apply and asses use of building materials in construction and asses their properties

Text Books:

1. P.K. Mukerjee, "A Text Book of Geology", World Press Pvt., Ltd. Kolkatta.
2. Parbin Singh, "Text Book of Engineering and General Geology", Published by S.K.Kataria and Sons, New Dehli

Reference Books:

1. Earthquake Tips - Learning Earthquake Design and Construction - C V R Murthy Published by National Information Centre of Earthquake Engineering, Indian Institute of Technology, Kanpur.
2. Dimitri P Krynine and William R Judd, "Principles of Engineering Geology and

- Geotechnics", CBS Publishers and Distributors, New Delhi.
3. K V G K Gokhale, "Principles of Engineering Geology", BS Publications, Hyderabad.
 4. M Anji Reddy, "Text book of Remote Sensing and Geographical Information System", BS Publications, Hyderabad.
 5. Ground water Assessment, development and Management by K.R. Karanth, Tata Mc Graw Hills
 6. K. Todd, "Groundwater Hydrology", Tata Mac Grow Hill, New Delhi.
 7. D. Venkata Reddy, "Engineering Geology", New Age International Publications, New Delhi.
 8. S.K Duggal, H.K Pandey and N Rawal, "Engineering Geology", McGraw Hill Education (India) Pvt, Ltd. New Delhi.
 9. M.P Billings, "Structural Geology", CBS Publishers and Distributors, New Delhi.
 10. K. S. Valdiya, " Environmental Geology", , Tata Mc Grew Hills.
 11. M. B. Ramachandra Rao, "Outlines of Geophysical Prospecting- A Manual for Geologists", Prasaraanga, University of Mysore, Mysore


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|---|---------------------------------|-------------------|-----------|
| TITLE OF THE COURSE: BASIC SURVEYING B.E., III Semester, Civil Engineering [As per Choice Based Credit System (CBCS) scheme] | | | |
| Course Code | 17 CV34 | CIE Marks | 40 |
| Number of Lecture Hours/Week | 04 | SEE Marks | 60 |
| Total Number of Lecture Hours | 50 (10 Hours per Module) | Exam Hours | 03 |
| Credits – 04 | | | |
| Course Objectives: This course will enable students to; <ol style="list-style-type: none"> 1. Understand the basic principles of Surveying 2. Learn Linear and Angular measurements to arrive at solutions to basic surveying problems. 3. Employ conventional surveying data capturing techniques and process the data for computations. 4. Analyze the obtained spatial data to compute areas and volumes and draw contours to represent 3D data on plane figures. | | | |
| Module-1 | | | |
| Introduction: Definition of surveying, Objectives and importance of surveying. Classification of surveys. Principles of surveying. Units of measurements, Surveying measurements and errors, types of errors, precision and accuracy. Classification of maps, map scale, conventional symbols, topographic maps, map layout, Survey of India Map numbering systems. | | | |
| Measurement of Horizontal Distances: Measuring tape and types. Measurement using tapes, Taping on level ground and sloping ground. Errors and corrections in tape measurements, ranging of lines, direct and indirect methods of ranging, Electronic distance measurement, basic principle. Booking of tape survey work, Field book, entries, Conventional symbols, Obstacles in tape survey, Numerical problems. | | | |
| L1, L2 | | | |
| Module-2 | | | |
| Measurement of Directions and Angles: Compass survey: Basic definitions; meridians, bearings, magnetic and True bearings. Prismatic and surveyor's compasses, temporary adjustments, declination. Quadrantal bearings, whole circle bearings, local attraction and related problems | | | |
| Theodolite Survey and Instrument Adjustment: Theodolite and types, Fundamental axes and parts of Transit theodolite, uses of theodolite, Temporary adjustments of transit theodolite, measurement of horizontal and vertical angles, step by step procedure for obtaining permanent adjustment of Transit theodolite | | | |
| L2,L3 | | | |
| Module-3 | | | |
| Traversing: Traverse Survey and Computations: Latitudes and departures, rectangular coordinates, Traverse adjustments, Bowditch rule and transit rule, Numerical Problems | | | |

Tacheometry: basic principle, types of tacheometry, distance equation for horizontal and inclined line of sight in fixed hair method, problems

L1, L2

Module-4

Leveling: Basic terms and definitions, Methods of leveling, Dumpy level, auto level, digital and laser levels. Curvature and refraction corrections. Booking and reduction of levels. Differential leveling, profile leveling, fly leveling, check leveling, reciprocal leveling, trigonometric leveling (heights and distances-single plane and double plane methods.)

L3,L4

Module-5

Areas and Volumes: Measurement of area – by dividing the area into geometrical figures, area from offsets, mid ordinate rule, trapezoidal and Simpson's one third rule, area from co-ordinates, introduction to planimeter, digital planimeter. Measurement of volumes- trapezoidal and prismoidal formula.

Contouring: Contours, Methods of contouring, Interpolation of contours, contour gradient, characteristics of contours and uses.

L2,L3

Course outcomes: After a successful completion of the course, the student will be able to:

1. Posses a sound knowledge of fundamental principles Geodetics
2. Measurement of vertical and horizontal plane, linear and angular dimensions to arrive at solutions to basic surveying problems.
3. Capture geodetic data to process and perform analysis for survey problems]
4. Analyse the obtained spatial data and compute areas and volumes. Represent 3D data on plane figures as contours

Text Books:

1. B.C. Punmia, "Surveying Vol.1", Laxmi Publications pvt. Ltd., New Delhi – 2009.
2. Kanetkar T P and S V Kulkarni , Surveying and Leveling Part I, Pune Vidyarthi Griha Prakashan, 1988

Reference Books:

1. S.K. Duggal, "Surveying Vol.1", Tata McGraw Hill Publishing Co. Ltd. New Delhi.2009.
2. K.R. Arora, "Surveying Vol. 1" Standard Book House, New Delhi. – 2010
3. R Subramanian, Surveying and Leveling, Second edition, Oxford University Press, New Delhi
4. A. Bannister, S. Raymond , R. Baker, "Surveying", Pearson, 7th ed., New Delhi

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ENVIRONMENTAL STUDIES

[As per Choice Based Credit System (CBCS) scheme]

(Effective from the academic year 2017 -2018)

SEMESTER - I/II

| | | | |
|-------------------------------|-----------------|------------|----|
| Subject Code | 17CIV18/17CIV28 | IA Marks | 20 |
| Number of Lecture Hours/Week | 02 | Exam Marks | 30 |
| Total Number of Lecture Hours | 25 | Exam Hours | 02 |

Course Objectives:

1. To identify the major challenges in environmental issues and evaluate possible solutions.
2. Develop analytical skills, critical thinking and demonstrate socio-economic skills for sustainable development.
3. To analyze an overall impact of specific issues and develop environmental management plan.

Module - 1

Introduction: Environment - Components of Environment Ecosystem: Types & Structure of Ecosystem, Balanced ecosystem Human Activities – Food, Shelter, And Economic & Social Security. **2 Hours**

Impacts of Agriculture & Housing Impacts of Industry, Mining & Transportation Environmental Impact Assessment, Sustainable Development. **3 Hours**

Module - 2

Natural Resources, Water resources – Availability & Quality aspects, Water borne diseases & water induced diseases, Fluoride problem in drinking water Mineral resources, Forest Wealth Material Cycles – Carbon Cycle, Nitrogen Cycle & Sulphur Cycle. **2 Hours**

Energy – Different types of energy, Conventional sources & Non Conventional sources of energy Solar energy, Hydro electric energy, Wind Energy, Nuclear energy, Biomass & Biogas Fossil Fuels, Hydrogen as an alternative energy. **3 Hours**


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Module -3

Environmental Pollution – Water Pollution, Noise pollution, Land Pollution, Public Health Aspects. **2 Hours**

Global Environmental Issues: Population Growth, Urbanization, Land Management, Water & Waste Water Management. **3 Hours**

Module -4

Air Pollution & Automobile Pollution: Definition, Effects – Global Warming, Acid rain & Ozone layer depletion, controlling measures. **3 Hours**

Solid Waste Management, E - Waste Management & Biomedical Waste Management - Sources, Characteristics & Disposal methods. **2 Hours**

Module - 5

Introduction to GIS & Remote sensing, Applications of GIS & Remote Sensing in Environmental Engineering Practices. **2 Hours**

Environmental Acts & Regulations, Role of government, Legal aspects, Role of Non-governmental Organizations (NGOs) , Environmental Education & Women Education. **3 Hours**

Course Outcome:

Students will be able to,

1. Understand the principles of ecology and environmental issues that apply to air, land, and water issues on a global scale,
2. Develop critical thinking and/or observation skills, and apply them to the analysis of a problem or question related to the environment,
3. Demonstrate ecology knowledge of a complex relationship between biotic and abiotic components
4. Apply their ecological knowledge to illustrate and graph a problem and describe the realities that managers face when dealing with complex issues

Text Books:

1. Benny Joseph (2005), **"Environmental Studies"**, Tata McGraw – Hill Publishing Company Limited.
2. R.J.Ranjit Daniels and Jagadish Krishnaswamy, (2009), **"Environmental Studies"**, Wiley India Private Ltd., New Delhi.
3. R Rajagopalan, **"Environmental Studies – From Crisis to Cure"**, Oxford University Press, 2005,
4. Aloka Debi, **"Environmental Science and Engineering"**, Universities Press (India) Pvt. Ltd. 2012.

Reference Books:

1. Raman Sivakumar, **"Principals of Environmental Science and Engineering"**, Second Edition, Cengage learning Singapore, 2005
2. P. Meenakshi, **"Elements of Environmental Science and Engineering"**, Prentice Hall of India Private Limited, New Delhi, 2006
3. S.M. Prakash, **"Environmental Studies"**, Elite Publishers Mangalore, 2007
4. Erach Bharucha, **"Text Book of Environmental Studies"**, for UGC, University press, 2005
5. G.Tyler Miller Jr., **"Environmental Science – working with the Earth"**, Tenth Edition, Thomson Brooks /Cole, 2004
6. G.Tyler Miller Jr., **"Environmental Science – working with the Earth"**, Eleventh Edition, Thomson Brooks /Cole, 2006
7. Dr.Pratiba Sing, Dr.AnoopSingh and Dr.Piyush Malaviya, **"Text Book of Environmental and Ecology"**, Acme Learning Pvt. Ltd. New Delhi.


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ENVIRONMENTAL STUDIES

[As per Choice Based Credit System (CBCS) scheme]

(Effective from the academic year 2015 -2016)

SEMESTER - I/II

| | | | |
|-------------------------------|-----------------|------------|----|
| Subject Code | 15CIV18/15CIV28 | IA Marks | 10 |
| Number of Lecture Hours/Week | 02 | Exam Marks | 40 |
| Total Number of Lecture Hours | 25 | Exam Hours | 02 |

Course Objectives:

1. To identify the major challenges in environmental issues and evaluate possible solutions.
2. Develop analytical skills, critical thinking and demonstrate socio-economic skills for sustainable development.
3. To analyze an overall impact of specific issues and develop environmental management plan.

Module - 1


Introduction: Environment - Components of Environment Ecosystem: Types & Structure of Ecosystem, Balanced ecosystem Human Activities – Food, Shelter, And Economic & Social Security. **2 Hours**

Impacts of Agriculture & Housing Impacts of Industry, Mining & Transportation Environmental Impact Assessment, Sustainable Development. **3 Hours**

Module - 2

Natural Resources, Water resources – Availability & Quality aspects, Water borne diseases & water induced diseases, Fluoride problem in drinking water Mineral resources, Forest Wealth Material Cycles – Carbon Cycle, Nitrogen Cycle & Sulphur Cycle. **2 Hours**

Energy – Different types of energy, Conventional sources & Non Conventional sources of energy Solar energy, Hydro electric energy, Wind Energy, Nuclear energy, Biomass & Biogas Fossil Fuels, Hydrogen as an alternative energy. **3 Hours**


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Module -3

Environmental Pollution – Water Pollution, Noise pollution, Land Pollution, Public Health Aspects. **2 Hours**

Global Environmental Issues: Population Growth, Urbanization, Land Management, Water & Waste Water Management. **3 Hours**

Module -4

Air Pollution & Automobile Pollution: Definition, Effects – Global Warming, Acid rain & Ozone layer depletion, controlling measures. **3 Hours**

Solid Waste Management, E - Waste Management & Biomedical Waste Management - Sources, Characteristics & Disposal methods. **2 Hours**

Module - 5

Introduction to GIS & Remote sensing, Applications of GIS & Remote Sensing in Environmental Engineering Practices. **2 Hours**

Environmental Acts & Regulations, Role of government, Legal aspects, Role of Non-governmental Organizations (NGOs) , Environmental Education & Women Education. **3 Hours**

Course Outcome:

Students will be able to,

1. Understand the principles of ecology and environmental issues that apply to air, land, and water issues on a global scale,
2. Develop critical thinking and/or observation skills, and apply them to the analysis of a problem or question related to the environment,
3. Demonstrate ecology knowledge of a complex relationship between biotic and abiotic components
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- 42
1. Benny Joseph (2005), **"Environmental Studies"**, Tata McGraw – Hill Publishing Company Limited.
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VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI

Constitution of India, Professional Ethics and Human Rights (CPH)

(Common to all branches)

[As per Outcome Based Education(OBE) and Choice Based Credit System (CBCS) scheme]
(Effective from the academic year 2018-19)

| | | |
|--------------------|----------------------|---------------|
| Course Code | : 17CPH39/49 | SEE Marks: 30 |
| Contact Hours/Week | : 01 hr Theory /week | CIE Marks: 20 |
| Total Hours | : 15 | Exam: 02 hr |
| Semester | : III / IV | Credit: 1 |

Course Learning Objectives: This course (17CPH39/49) will enable the students

- To assimilate and get familiarized with basic information about Indian constitution and provide overall legal literacy to the young technocrats to manage complex societal issues in the present scenario.
- To identify their individual roles and ethical responsibilities towards society.
- To understand engineering ethics & responsibilities, through the learning of these topics students will be able to understand human rights/ values and its implications in their life.

MODULE- I

Introduction and Basic Information about Indian Constitution

- The Necessity of the Constitution, The Societies before and after the Constitution adoption.
- Introduction to the Indian constitution, The making of the Constitution, The Role of the Constituent Assembly - Preamble and Salient features of the Constitution of India. Fundamental Rights and its Restriction and limitations in different Complex Situations.
- Directive Principles of State Policy (DPSP) & it's present relevance in our society with examples. Fundamental Duties and its Scope and significance in Nation building.

(Duration: 03 Hours & RBT Levels: L1, L2 & L3)

MODULE- II

Union Executive and State Executive

- Parliamentary System, Federal System, Centre-State Relations.
- Union Executive – President, Prime Minister, Union Cabinet, Parliament - LS and RS, Parliamentary Committees, Important Parliamentary Terminologies. Supreme Court of India, Judicial Reviews and Judicial Activism.
- State Executives – Governor, Chief Minister, State Cabinet, State Legislature, High Court and Subordinate Courts, Special Provisions (Article 370,371,371J) for some States.

(Duration: 03 Hours & RBT Levels: L1, L2 & L3)

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MODULE-III

Elections, Amendments and Emergency Provisions

- Elections, Electoral Process, and Election Commission of India, Election Laws.
- Amendments - Methods in Constitutional Amendments (How and Why) and Important Constitutional Amendments. Amendments – 7,9,10,12,42,44, 61, 73,74, ,75, 86, and 91,94,95,100,101,118 and some important Case Studies. Recent Amendments with explanation. Important Judgements with Explanation and its impact on society (from the list of Supreme Court Judgements).
- Emergency Provisions, types of Emergencies and it's consequences.

(Duration: 03 Hours & RBT Levels: L1, L2 & L3)

Module- IV

Constitutional Provisions/ Local Administration/ Human Rights

- Special Constitutional Provisions for SC & ST, OBC, Special Provision for Women, Children & Backward Classes.
- Local Administration : Powers and functions of Municipalities and Panchyats System. Co – Operative Societies and Constitutional and Non-constitutional Bodies.
- Human Rights/values – Meaning and Definitions, Legislative Specific Themes in Human Rights and Functions/ Roles of National Human Rights Commission of India. Human Rights (Amendment Act)2006.

(Duration: 03 Hours & RBT Levels: L1, L2 & L3)

MODULE- V

Professional / Engineering Ethics

- Scope & Aims of Engineering & Professional Ethics - Business Ethics, Corporate Ethics, Personal Ethics. Engineering and Professionalism, Positive and Negative Faces of Engineering Ethics, Code of Ethics as defined in the website of Institution of Engineers (India) : Profession, Professionalism, Professional Responsibility. Clash of Ethics, Conflicts of Interest.

Responsibilities in Engineering

- Responsibilities in Engineering and Engineering Standards, the impediments to Responsibility.Trust and Reliability in Engineering, IPRs (Intellectual Property Rights),
- Risks, Safety and liability in Engineering.

(Duration: 03 Hours & RBT Levels: L1, L2 & L3)

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Course Outcomes: On completion of this course, students will be able to,

- CO1: Have general knowledge and legal literacy about Indian Constitution and there by it helps to take up competitive examinations & to manage/face complex societal issues in society.
- CO2: Understand state and central policies(Union and State Excutive), fundamental Rights & their duties.
- CO3: Understand Electoral Process, Amendments and special provisions in Constitution.
- CO4: Understand powers and functions of Municipalities, Panchayats and Co-operative Societies, with Human Rights and NHRC.
- CO5: Understand Engineering & Professional ethics and responsibilities of Engineers.

Question paper pattern for SEE and CIE.

- The SEE question paper will be set for 30 marks and the pattern of the question paper will be objective type (MCQ).
- For the award of 20 CIE marks, refer the University Scheme and Syllabus book.

Text Books

- 1) **Durga Das Basu (DD Basu):** "Introduction to the Constitution on India", (Students Edition.) Prentice –Hall EEE, 19th / 20th Edn., (Latest Edition) or 2008.
- 2) **Shubham Singles, Charles E. Haries, and Et al :** "Constitution of India and Professional Ethics" by Cengage Learning India Private Limited, Latest Edition – 2018.

Reference Books

1. **M.Govindarajan, S.Natarajan, V.S.Senthilkumar,** "Engineering Ethics", Prentice –Hall of India Pvt. Ltd. New Delhi, 2004
2. **M.V.Pylee,** "An Introduction to Constitution of India", Vikas Publishing, 2002.
3. Latest Publications of **NHRC - Indian Institute of Human Rights,** New Delhi.

Web Links and Video Lectures

www.unacademy.com/lesson/future-perfect-tense/YQ9NSNQZ

<https://successesacademy>


V. S. Senthilkumar
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