

CE 8311

Elective - I

CE-VIII

EIGHTH SEMESTER		CIVIL ENGINEERING				
COURSE CONTENTS						
CE-8021	Remote Sensing & Geographic Information System	L	T	P	Max. Marks	Min. Marks
Duration	3 Hours	3	1	0	70	22

UNIT - I

- Remote Sensing - history & development, definition, concept and principles
- Energy Resources, radiation principles, EM Radiation and EM Spectrum
- Interaction of EMR with atmosphere and Earth's surface
- Platforms - Types and their characteristics
- Satellite and their characteristics, Sensors - Types and their characteristics Optical mechanical scanners - MSS, TM, LISS, WIFS, PAN.

UNIT - II

- Concept of Resolution - Spatial, Spectral, Temporal, Radiometric.
- Basic Concept and principles of Thermal, microwave and hyper spectral sensing.
- Basic principles, types, steps and elements of image interpretation, Techniques of visual interpretation and interpretation keys.
- Instruments for visual interpretation, Remote Sensing Data Products and their procurement.
- Digital Image processing

UNIT - III

- Geographic Information System (GIS) - Introduction, GIS overview and GIS applications
- GIS components.
- The nature of Geographic data, spatial data models, Raster data models, Vector data models.
- Global Positioning System (GPS) - Introduction, Characteristics of GPS satellites, GPS for GIS and mapping
- Introduction to Remote Sensing and GIS Software's.

UNIT - IV

Application of Remote Sensing in Land use/Land cover mapping, Regional and Urban mapping, Geologic Geomorphologic and geomorphic features mapping, digital terrain model

UNIT - V

Application of Remote Sensing in Soil mapping and characteristics, Water resources engineering and ground water targeting, Environmental pollution monitoring, Urban sprawl monitoring, waste disposal sites.

Reference Books :

1. Remote Sensing in Civil Engineering - Kennie, J.J. M., Matthews, M.C.
2. Remote Sensing principles and interpretation - Floyd F. Sabins, Jr W.H. Freeman & Co.
3. Remote Sensing and image interpretation - Lillesand, Kidder, John Wiley & Sons.
4. Introduction to Remote Sensing and concepts - Gibson.
5. Principles of Geographical information systems for land resource assessment - P.A. Burrough (Clarendon Press, Oxford)
6. Geographic Information systems a management perspective - Stan Aronoff (WDL publications, Ottawa).



EIGHTH SEMESTER				CIVIL ENGINEERING		
COURSE CONTENTS						
CE-8024	Advance Water Resources Engineering	L	T	P	Max. Marks	Min. Marks
Duration	3 Hours	3	1	0	70	22

UNIT – I

GROUND WATER FLOW AND AQUIFER PROPERTIES: Interstices, Porosity, Specific Yield and its determination, Coefficients of Storage, Permeability and Transmissibility, Water Yield Properties, Characteristics of Aquifers, Ground Water Exploration, Presentation of Hydro Geological Data.

UNIT – II

WELL HYDRAULICS: Darcy's Law, Volume Elasticity of Aquifers, Differential Equations Governing Ground Water Flow. Hydrogeological Boundaries, Flow from and to Streams, Numerical analysis of Water Levels, Drawdown, Nonleaky Isotropic Artisan Aquifer, Nonleaky Anisotropic Artisan Aquifer, Water Table Aquifer, Leaky Aquifer, Boundary Conditions, Salt Water Encroachment.

UNIT – III

Floods : Types of floods and their estimation by different methods, probability and frequency analysis, flood routing through reservoirs and channels, flood control measures, economics of flood control.

UNIT – IV

Water logging and salt efflorescence: Water logging-causes, effects and its prevention. Salt efflorescence causes and effects. reclamation of water logged and salt affected lands.

UNIT – V

Water resources planning and management: Planning of water resources projects, data requirements, economic analysis of water resources projects appraisal of multipurpose projects, optimal operation of projects introduction to linear programming and its application to water resources projects. Role of water in the environment, rain water harvesting, impact assessment of water resources development and managerial measures.

Suggested Books :-

1. Engg. Hydrology - J.NEMEC - Prentice Hall
2. Hydrology for Engineers Linsley, Kohler, Paulnus - Tata Mc.Graw Hill.
3. Engg. Hydrology by K. Subhramanya - Tata Mc Graw Hills Publ. Co.
4. Hydrology & Flood Control by Santosh Kumar - Khanna Publishers
5. Engg. Hydrology by H.M. Raghunath

Arath *Santa Monica*

CE 8331 (OEL-III)

MUNICIPAL SOLID WASTE MANAGEMENT (ELECTIVE VII)

Coarse Objectives:

- 1 To define the terminology, sources, classification & environmental impacts.
- 2 To illustrate the steps in solid waste management & procedure adopted in quantity estimation.
- 3 To illustrate the methods for representative sample collection, Sample analysis & characteristics of solid waste.
- 4 To illustrate solid waste collection methods & Planning of vehicle routes.
- 5 To illustrate solid waste processing & disposal methods.
- 6 To explain & examine the characteristics of leachate generated from landfills, its quantitative & qualitative assessment of treatment & legislative norms related to solid wastes.

UNIT - I

General: Definition, important terminology, need, objective, principle.

Classification of Waste : Residential, Municipal, Commercial, Institutional, Garbage, Rubbish, Ashes, Bulky waste, Street sweeping, construction and demolition, industrial, Hazardous, sewage, Dead animal & Slaughter house waste, Functional elements, Problems in developing countries.

Quantity of Solid Waste: Waste generation – Street waste, urban, solid waste, Quantity at disposal sites, Quantity forecast.

UNIT - II

Characteristics of Solid Waste: Need of analysis, Field investigation, collection of samples, physical and chemical characteristics of waste.

Waste Collection: House-to-house, community bin system, frequency of collection, transfer stations, volume reduction at source and transfer stations, tools & equipment, refuse transportation vehicles planning of vehicle routes.

UNIT - III

Composting: Definition, use, principle, factors affecting composting process, control of the composting process, methods of composting – Indore and Bangalore, mechanical & other methods.

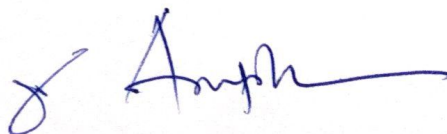
Incineration: Self sustained combustion reaction, advantages and disadvantages, types of incinerators, auxiliary fuels, use of refuse as secondary fuel, product of incinerators, air pollution and control.

UNIT - IV

Disposal of Municipal Solid Waste : History, open land dumping, open combustion, sanitary landfill – Trench method, area method and ramp method, compaction and settlement, mechanical equipment, densities of landfills, selection of sites, maintenance of sites.

Bioreactor landfill: Advantages and disadvantages, phases of waste decomposition.

UNIT - V



Environmental menace of landfill : Leachate & Gases, leachate quantity & quality, factors affecting leachate quantity and quality, landfill leachate treatment, advantages and disadvantages of leachate recirculation, Lysimeters, Indian scenario of SWM Regulations, Municipal Solid Waste Management (Management & Handling) Rule, 2000.

Solid Waste Management (Laboratory)

LIST OF EXPERIMENTS:

- 1 General Introduction of solid waste management system.
- 2 Fabrication of Lysimeter
- 3 Shorting of Municipal Solid Waste & preparation of Lysimeter for leachate generation
- 4 Leachate generation & Waste Settlement.
- 5 To determine pH value of leachate sample.
- 6 To determine the total, suspended, dissolved, volatile solids in leachate samples.
- 7 To determine Biochemical oxygen demand of leachate sample.
- 8 To determine Chemical oxygen demand of leachate sample.
- 9 To determine Chloride content in leachate sample.
- 10 To determine Hardness in leachate sample.
- 11 Estimation & Monitoring of S.W. generation, collection of disposal,
- 12 Estimation & Monitoring of S.W. generation, collection of disposal,

REFERENCE BOOKS:

- 1 Bhide A.D. – Solid Waste Management.
- 2 Expert Committee Report (2000) – Solid Waste Manual – Ministry of Environment & Forest.
- 3 Municipal Solid Waste Management (Management & Handling) Rule, 2000 & Solid Waste Management rule 2016

