



**OPEN ELECTIVES OFFERED TO OTHER DEPARTMENTS
(R22)
(From Civil Engineering Department)**

S.No.	Course Code	Course Title
1.	OE	Disaster Management
2.	OE	Remote Sensing and GIS
3.	OE	Geo Informatics
4.	OE	Environmental Impact Assessment
5.	OE	Basic Civil Engineering

*Not in order

Open Elective – Students should take *Open Electives* from the list of Open Electives offered by Other Departments/Branches Only.

Ex: A Student of Civil Engineering can take *Open Electives* from all other departments/branches except Open Electives offered by Civil Engineering Department.



DISASTER MANAGEMENT - C10E1

B.Tech

L/T/P/C

3/0/0/3

Course Objectives: The subject provide different disasters, tools and methods for disaster Management

Course Outcomes: At the end of the course, the student will be able to:

1. Understanding Disasters, man-made Hazards and Vulnerabilities
2. Understanding disaster management mechanism
3. Understanding capacity building concepts and planning of disaster managements
4. To increase the knowledge and understanding of the disaster phenomenon, its different contextual aspects, impacts and public health consequences.
5. To ensure skills and ability to design, implement and evaluate research on disasters

UNIT - I

Understanding Disaster: Concept of Disaster - Different approaches- Concept of Risk Levels of Disasters - Disaster Phenomena and Events (Global, national and regional)

Hazards and Vulnerabilities: Natural and man-made hazards; response time, frequency and forewarning levels of different hazards - Characteristics and damage potential or natural hazards; hazard assessment - Dimensions of vulnerability factors; vulnerability assessment - Vulnerability and disaster risk - Vulnerabilities to flood and earthquake hazards

UNIT - II

Disaster Management Mechanism: Concepts of risk management and crisis managements - Disaster Management Cycle - Response and Recovery - Development, Prevention, Mitigation and Preparedness - Planning for Relief

UNIT – III

Capacity Building: Capacity Building: Concept - Structural and Non-structural Measures Capacity Assessment; Strengthening Capacity for Reducing Risk - Counter-Disaster Resources and their utility in Disaster Management - Legislative Support at the state and national levels

UNIT – IV

Coping with Disaster: Coping Strategies; alternative adjustment processes - Changing Concepts of disaster management - Industrial Safety Plan; Safety norms and survival kits - Mass media and disaster management

UNIT - V

Planning for disaster management: Strategies for disaster management planning - Steps for formulating a disaster risk reduction plan - Disaster management Act and Policy in India - Organizational structure for disaster management in India - Preparation of state and district disaster management plans



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TEXT BOOKS:

1. Manual on Disaster Management, National Disaster Management, Agency Govt. of India.
2. Disaster Management by Mrinalini Pandey Wiley 2014.
3. Disaster Science and Management by T. Bhattacharya, McGraw Hill Education (India) Pvt Ltd Wiley 2015

REFERENCES:

1. Earth and Atmospheric Disasters Management, N. Pandharinath, CK Rajan, BS Publications 2009.
2. National Disaster Management Plan, Ministry of Home affairs, Government of India (<http://www.ndma.gov.in/images/policyplan/dmplan/draftndmp.pdf>)



REMOTE SENSING & GEOGRAPHIC INFORMATION SYSTEM - D14PC11

B.Tech.

L/T/P/C

3/0/0/3

COURSE OUTCOMES: After completing this Course, the student will be able to

1. Understand the Concepts and Principles of Aerial Photogrammetry and Compute Heights of the Objects Using Relief Displacement and Parallax
2. Understand the Principles and Basic Concept of Remote Sensing and GIS and Its Applications; Know Different Types of Data Representations in GIS
3. Understand the Map Projections and Coordinates Systems.
4. Understand the Application of Vector and Raster Data Structures to the Real World.
5. Understand the Importance of Source Map and on-Screen Digitization.

UNIT – I

Introduction to Photogrammetry: Principles & Types of Aerial Photographs, Geometry of Vertical Aerial Photograph, Scale & Height Measurement on Single Vertical Aerial Photograph, Height Measurement Based on Relief Displacement, Fundamentals of Stereoscopy, Fiducial Points, Parallax Measurement Using Fiducial Line.

UNIT-II

Remote Sensing: Basic Concept of Remote Sensing, Data and Information, Remote Sensing Data Collection, Remote Sensing Advantages & Limitations, Remote Sensing Process. Electro-Magnetic Spectrum, Energy Interactions with Atmosphere and with Earth Surface Features (Soil, Water, Vegetation), Indian Satellites and Sensors, IKONOS Satellite Sensor, Blue Bird Satellites – Their Characteristics, Resolution, Map and Image and False Color Composite, Introduction to Digital Data, Elements of Visual Interpretation Techniques.

UNIT-III

Geographic Information Systems: Introduction to GIS; Components of A GIS; Geospatial Data: Spatial Data, Attribute Data – Joining Spatial and Attribute Data; GIS Operations: Spatial Data Input – Attribute Data Management – Data Display – Data Exploration – Data Analysis. Coordinate Systems: Geographic Coordinate System: Approximation of the Earth, Datum; Map Projections: Types of Map Projections – Map

UNIT-IV

Vector Data Model: Representation of Simple Features - Topology and its Importance; Coverage and its Data Structure, Shape File; Data Models for Composite Features; Object Based Vector Data Model; Classes and their Relationships; The Geobase Data Model; Geometric Representation of Spatial Feature and Data Structure, Topology Rules.

UNIT-V

Raster Data Model: Elements of the Raster Data Model, Types of Raster Data, Raster Data Structure, Data Conversion, Integration of Raster and Vector Data. Data Input: Metadata, Conversion of Existing Data, Creating New Data; Remote Sensing Data, Field Data; Text



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Data; Digitizing, Scanning, on-Screen Digitizing, Importance of Source Map, Data Editing. Demonstration of GIS Software – GIS Applications: Environment, Water Resources and Agriculture.

TEXT BOOKS:

1. Elements of Photogrammetry with Applications in GIS, Paul R. Wolf - Bon A. Dewitt - Benjamin E. Wilkinson.
2. Geographic Information Systems: A Management Perspective by Stan Aronoff, WDL Publications.
3. Remote Sensing of the Environment - An Earth Resource Perspective by John R. Jensen, Pearson Education.
4. Introduction to Geographic Information System by Kang-Tsung Chang, Tata McGraw Hill Publishing Co. Pvt. Ltd., New Delhi.

REFERENCE BOOKS:

1. Concepts & Techniques of GIS by C.P. Lo Albert, K.W. Young, Prentice Hall India Learning Pvt. Ltd.
2. Remote Sensing and Geographical Information Systems by M. Anji Reddy.
3. Principals of Geo Physical Information Systems by Peter A. Burrough and Rachael A. Mc Donnell, Oxford University Press, New Delhi.
4. Basics of Remote Sensing &GIS by S. Kumar, Laxmi Publications (P) Ltd.
5. www.iirs.gov.in
6. www.easyengineering.net



GEO INFORMATICS

B.Tech.

L/T/P/C

3/0/0/3

Course Objectives:

1. To introduce the concepts of remote sensing, satellite image characteristics and its components.
2. To expose the various remote sensing platforms and sensors and to introduce the concepts of GIS, GPS and GNSS.

Course Outcomes: At the end of the course the student will be able to understand

1. The characteristics of Aerial photographic images, Remote sensing satellites and Applications of remote sensing.
2. The GIS and its Data models.
3. The Global Navigation Satellite System.
4. Will understand the basics of data capture, storage, analysis, and output in a GIS
5. Will be able to describe what geography and GIS are

UNIT – I

Aerial Photographs - Basic terms & Definitions, scales, relief displacements, Flight Planning, Stereoscopy, Characteristics of photographic images, Fundamentals of aerial photo interpretation, Introduction to Digital Photogrammetry

UNIT - II

Remote Sensing: Physics of remote sensing, Remote sensing satellites, and their data products, Sensors and orbital characteristics, Spectral reflectance curves, resolution and multi-concept, FCC.

UNIT – III

Satellite Image - Characteristics and formats, Image histogram, Introduction to Image rectification, Image Enhancement, Land use and land cover classification system, Unsupervised and Supervised Classification, Applications of remote sensing.

UNIT - IV

Basic concepts of geographic data, GIS and its components, Data models, Topology, Process in GIS: Data capture, data sources, data encoding, geospatial analysis, GIS Applications.

UNIT - V

Global Navigation Satellite System (GNSS), GPS, GLONASS, GALILEO, GPS: Space segment, Control segment, User segment, GPS satellite signals, Datum, coordinate system and map projection, Static, Kinematic and Differential GPS, GPS Applications.

TEXT BOOKS:

1. Remote Sensing & GIS, BS Publications
2. Higher Surveying by A M Chandra New Age International Publisher
3. Remote Sensing & GIS by B. Bhatta, Oxford University Press
4. Introduction to GPS by A. E Rabbany Library of congress cataloguing in Publication Data.



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REFERENCES:

1. T M Lillesand et al: Remote Sensing & Image Interpretation
2. Higher Surveying by B C Punmia Ashok kr. Jain Laxmi Publications
3. N K Agarwal: Essentials of GPS, Spatial Networks: Hyderabad



ENVIRONMENTAL IMPACT ASSESSMENT

B.Tech.

L/T/P/C

3/0/0/3

Course Objective:

1. To make the students conversant Impacts of Development on Environment
2. To understand the Frame work of Impact Assessment and its determination
3. To expose the students to understand the design of Environmental Monitoring Plan
4. To provide adequate knowledge about the Baseline monitoring of Socio economic environment and Social impacts of developmental projects.

Course Outcomes:

1. To Understand environmental problems arising due to engineering and technological activities and the science behind those problems
2. To Analyse and mitigate the environmental and social impacts of developmental projects.
3. To apply EIA standards for Social impacts of developmental projects
4. To evaluate a suitable method for Mathematical models for Impact prediction

UNIT I- Introduction

Impacts of Development on Environment – Rio Principles of Sustainable Development- Environmental Impact Assessment (EIA) – Need for EIA Studies – EIA Types – EIA in project cycle – EIA Notification and Legal Framework – Stakeholders and their Role in EIA – Selection & Registration Criteria for EIA Consultants – Screening and Scoping in EIA – Development Activity and Ecological Factors EIA, Rapid and Comprehensive EIA, EIS, FONSI.

UNIT II- Environmental Impact Assessment

Frame Work of Impact Assessment – Baseline Monitoring – Prediction and Assessment of Impact on Land, Water, Air, Noise and Energy, Flora and Fauna – Matrices – Networks – Checklist Methods Mathematical Models for Impact Prediction – Analysis of Alternatives.

UNIT III- Environmental Management Plan

Plan for Mitigation of Adverse Impact on Water, Air and Land, Water, Energy, Flora and Fauna – Environmental Monitoring Plan – EIA Report Preparation – Review of EIA Reports – Environmental Clearance – Environmental Audit.

UNIT IV- Socio Economic Assessment

Baseline Monitoring of Socio-economic environment – Identification of Project affected Personal – Rehabilitation and Resettlement Plan – Economic Valuation of Environmental Impacts Cost Benefit Analysis – Public Consultation.

UNIT V- Case Studies

EIA Case Studies Pertaining to Infrastructure Projects – Real Estate Development – Major industries, Power Plants – Thermal Power Plant Construction Activities – Electronic Hard ware Projects – Manufacturing Projects – Waste Processing & Disposal Facilities.



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TEXT BOOKS:

1. Environmental Impact Analysis - Jain R.K.-Van Nostrand Reinhold Co.
2. Environment Impact Assessment - Anjaneyalu. Y.
3. Environment Impact Assessment - Larry W. Canter - McGraw Hill Publication

REFERENCES:

1. Environmental Science and Engineering, by Suresh K. Dhaneja – S.K., Katari & Sons Publications, New Delhi.
2. Environmental Pollution and Control, by Dr H.S. Bhatia – Galgotia Publication (P) Ltd, Delhi
3. Guidelines for EIA of developmental Projects Ministry of Environment and Forests, GOI.
4. Environmental Science and Engineering, by J. Glynn and Gary W.Hein Ke – Prentice Hall Publishers.
5. EIA Notifications – 2006 of Government of India
6. EIA Manuals Prepared by IL & FS



BASIC CIVIL ENGINEERING

B.Tech.

L/T/P/C

3/0/0/3

Course objectives: The objective of this course is to

1. Know the various materials and components in building construction
2. Have knowledge on survey and highways engineering, irrigation and water supply engineering and soil mechanics.

Course outcomes: At the end of this course the student will be able to

1. Student will be able to identify various materials, components in building construction.
2. Student will be familiar in various disciplines in civil engineering.

UNIT – I

Construction materials

Stones – Characteristics of good building stones – common building stones and their uses

Bricks – Characteristics of good bricks – classification of bricks and their uses – Timber –

Classification of Timber and their uses – Cement – Types of cement and their uses

UNIT – II

Components of building

Components of sub structure and their functions – Components of super structure and their functions – Concrete and its importance in construction – Steel – Types of steel and its importance in construction.

UNIT – III

Survey and Highway Engineering

Definition and classification of surveying – linear and angular measurements – levelling
Modes of transportation – Classification of highways – Classification of pavements – Super elevation.

UNIT – IV

Irrigation and Water supply

Definition and classification of irrigation – Irrigation structures – dams, weirs, cross drainage works, canal drops – Quality of water – Treatment methods

UNIT – V

Geotechnical Engineering

Origin of soil – types of soil – bearing capacity of soil – Types of foundation – shallow and deep.

REFERENCES:

1. B C Punmia, Ashok K Jain, Arun K Jain, (1st Edition, 2003), “Basic Civil Engineering”, Laxmi Publications (P) Ltd.
2. G K Hiraskar, (1st Edition, 2004), “Basic Civil Engineering”, Dhanpat Rai Publication.