

Vinoba Bhave University , Hazaribagh

Civil Engineering			
CE501	Mechanics of Materials	L	T
		3	1

Detail Syllabus:

MODULE	CONTENTS	Hrs
1.	Elements of Elasticity: - Concept of stress & strains, stress & strain tensor. Three dimensional stress & strain analysis, Transformation of Stress & strain, Stress & strain invariants, Equilibrium equation, Compatibility equation, Boundary condition. Two dimensional problem in Cartesian co- ordinate, Solution by polynomials, Cantilever with end load, simple beam with udl, Stress Function strain gauges principle of photo	12
2.	Elastic Stability:- Energy method analysis of long column. Euler's theory of buckling for long column & its limitation. Rankine - Gardon formulae, laterally loaded	12
3	Theory of failure: various theory of failure	8
4	Elements of plastic theory:- Plastic hinge, shape factor, collapse load for beams & portal frame. Uniqueness, upper & lower bound theorem. Effect of axial force & shear in	10

Reference Books:

1. Timoshenko and Gere, Mechanics of Materials, CBS Publishers, New Delhi,1996
2. T. D. Gunneswra Rao and MudimbyAndal, Strength of Materials - Fundamentals and Applications, Cambridge University Press, 1st Edition,2018.
3. S. B. Junarkar, Mechanics of Structures, Charotar Publishers, Anand,1998.
4. Strength of Materials - Pytel& Singer, Harper & Row Publishers,2018

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Civil Engineering			
CE502	Environmental Engineering	L	T
		3	0

Detail Syllabus:

MODULE	CONTENTS	Hrs
1.	Water demand: - Population- forecast, design period, factors affecting populations growth, water demand, factors affecting rate of demand, variations in rate of demand.	8
2.	Quality of water: - sources of impurities, common impurities in water and their effect, water analysis, physical, chemical and biological characteristics, water borne diseases, Indian andWHO drinking standard.	8
3.	Purification: Sedimentation, flocculation, coagulation, filtration, disinfection, water softening, aeration, miscellaneous treatment method.	8
4.	Distribution of water: - Introductions , Methods of distribution, pressure in distribution mains, system of water supply, storage and distribution reservoir, layout and design of distribution	12
5.	Waste water treatment: - Sewage characteristics. Sewerage system: - Type, design, construction and maintenance. Treatment :- Primary and secondary treatments, screens, grit chamber, sedimentation chamber, principle and design of activated sludge digestion, final disposal of sludge and effluents, Disposal of sewage by dilution, self-purification of streams, sewage disposal by irrigation, waste water reuse, solid waste collection, re-	12

Reference Books

1. G.B. Masters, Introduction to Environmental Engineering and Science, Pearson Education,2013.
2. Gerard Kiely, Environmental Engineering, McGraw Hill Education Pvt Ltd, Special Indian Edition, 2007.
3. W P Cunningham, M A Cunningham, Principles of Environmental Science, Inquiry and Applications, Tata McGraw Hill, Eighth Edition,2016.
4. M. Chandrasekhar, Environmental science, Hi Tech Publishers,2009



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Civil Engineering			
HU501	Instrumentation and Process Control	L	T
		3	0

Course Overview:

This course is designed to help one develop communication skills in English with a sense of language. It will be of help to improve clarity, precision and overall impact in both oral as well as written communication. It will also enable one to produce clear and effective scientific and technical documents required for professional communication. We will focus on basic principles of good writing- which scientific and technical writing shares with other forms of writing-and on types of documents common in scientific and technical fields and organizations. One can learn how to gather, organize, and present information effectively according to audience and purpose. Moreover, emphasis will be on sustainable communication that will facilitate an understanding of one's role and help to align with the mission of the organization.

Objective:

To provide you with the communication skills one needs to advance in a field, keeping in mind that, in career, one may be involved with design, development, field service and support, management, sales, customer liaison, or all of the above.

Course Outcomes:

CO 1: Demonstrate effective oral and written communication with diverse audiences and produce variety

in professional written documents to better support and communicate.

CO 2: Plan and deliver a formal presentation on a topic with confidence and poise.

CO 3: Appraise ethics and social responsibility as a professional.

CO 4: Apply analytical skills and critical thinking to solve problems and can express using sound logical arguments utilizing the best available resources for communication.

CO 5: Exhibit an understanding of multiculturalism and be able to work well in teams.

Lecture 1-
10

Introduction to Communication

Communication and Self
Concept Role of Emotions
Basics of
Communication

Purpose of communication- to inform, to express feelings, to imagine, to influence, to meet social expectations and others

Audience analysis- identifying audience to determine the content, language usage and listener expectations for ensuring effective communication

Cross Cultural Communication and Multi Cultural
Communication

Effective Communication: Modes/



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Models/Networks

LSRW Skills
Non-Verbal
Communication

Barriers to Communication

Introductio

n

Intrapersonal and Interpersonal
Barriers

Organizational
Barriers

Information Gap Principle, Noise,
Filters



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Effective Listening and Speaking

Traits of a good listener

Phonetics – Basic Sounds of English – Word Accent - Intonation Achieving confidence, clarity and

fluency as a speaker, paralinguistic features, barriers to speaking, types of speaking, Persuasive

Speaking, Public Speaking etc.

Additional exercises and activities based on developing Listening and Speaking skills

Lecture 11-15

Planning, Outlining and Structuring

Choosing the mode of delivery

Guidelines for effective delivery,

Body Language and Voice, Visual Aids etc.

Activities and practice on developing Presentation skills

Lecture 16-20

Introduction, Objectives, Types, Samples and Examples

Problem Solving, Networking in English

Meetings and Conferences

Minutes of Meeting, Agenda of Meeting

Activities and exercise based on developing GD and Business Networking skills in English

Lecture 21-30

Introduction, Audience Recognition, Language, Grammar, Style, Techniques

The Art of Condensation

Note Making and Note Taking

Guidelines and Samples

Business/Official Communication

Letters, Resumes, Memos, and e-mails Rules, formats, Style,

Etiquette

Sales and Credit letters

Letter of Enquiry

Letter of Quotation, Order, Claim and Adjustment

Government Letters, Semi- Government Letters to Authorities etc.

Characteristics, Categories, Formats, Structures, Types, Samples

Job Application

Curriculum vitae

Resumes- Chronological, Combination, Functional etc.

Reports and Proposals of different kinds

Exercise and activities based on developing Writing skills

Lecture 31-35

Right Words and Phrases,

Sentence Patterns

Paragraph

Comprehension Passage etc.

Activities and Strategies to engage in active thinking about word meanings, the relationships among words, and use of words in different situations

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Lecture 36-40

Types: Skimming, Scanning, Intensive, Extensive

Value Based/Motivational Materials:

Articles, Prose, Text Reading

Activities and exercise based on developing Reading skills

Lecture 41-45

Types and Overview

Emotional Intelligence

Decision Making and Time Management

Activities and exercise based on developing Leadership and Management skills

Recommended Texts:

8. Raman , Meenakshi and Sangeeta Sharma. *Technical Communication: Principles and Practice*. 2nd ed. OUP India, 2012.
9. Markel, Mike. *Technical Communication*. 7th ed. New York, NY: Bedford/St. Martin's, 2003. ISBN: 9780312403386.
10. Gamble, Teri Kwal and Michael Gamble. *Communication Works*. 9th Ed. New Delhi: Tata-McGraw-Hill, 2010.
11. Hacker, Diana. *A Pocket Style Manual*. 4th ed. New York, NY: Bedford/St. Martin's, 1999. ISBN: 9780312406844.
12. Perelman, Leslie C., James Paradis, and Edward Barrett. *The Mayfield Handbook of Technical and Scientific Writing*. New York, NY: McGraw-Hill, 1997. ISBN: 9781559346474.
13. David F. Beer and David McMurrey, *Guide to Writing as an Engineer*, 2nd ed., Wiley, 2004, ISBN: 0471430749.
14. Dale Jungk, *Applied Writing for Technicians*, McGraw-Hill, 2005, ISBN 0-07-828357-4.



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Civil Engineering			
CE511	Water Resources Engineering-1	L	T
		3	0

Detail Syllabus:

MODULE	CONTENTS	Hrs
1.	Introduction - Hydrologic cycle, water-budget equation, history of hydrology, world water budget, Water budget of India, Organization preserving hydrological data,	4
2.	Precipitation – types and forms of precipitation, different characteristics of rainfall and their representation, measurement of rainfall , rain gauge network, mean precipitation over an area, depth area-duration relationships, maximum intensity/depth-	8
3.	Abstractions from precipitation - evaporation process, evaporimeters, analytical methods of evaporation estimation, reservoir evaporation and methods for its reduction, evapotranspiration, measurement of evapotranspiration, evapotranspiration equations, potential evapotranspiration, actual evapotranspiration, interception, depression storage, infiltration, infiltration capacity, measurement of infiltration, infiltration	10
4.	Runoff – components Estimation of run off, SCS-CN method estimating runoff, flow duration curve, flow-mass curve, Different types of indices.	4
5.	Hydrograph: Elements of storm hydrograph, simple and complex storm hydrograph, factors affecting runoff hydrograph, components of hydrograph, base flow separation, effective rainfall, unit hydrograph,	10
6.	Floods estimation and Flood Routing: Estimation of peak discharge, rational method, SCS method and unit hydrograph method, Design flood, return period, flood frequency analysis, concepts of flow routing,	8

Suggested books:

1. K Subramanya, Engineering Hydrology, Mc-GrawHill.
2. K N Muthreja, Applied Hydrology, Tata Mc-GrawHill.
3. K Subramanya, Water Resources Engineering through Objective Questions, Tata Mc- GrawHill.



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Civil Engineering			
CE512	Solid waste management	L	T
		3	0

Detail Syllabus:

MODULE	CONTENTS	Hrs
1.	Solid Waste Management - Municipal Solid Waste Management different Sources; composition; generation rates; collection of waste; separation, transfer and transport of waste; treatment and disposal options, Hazardous Waste Management - Fundamentals	14
2.	Biological Treatment : Biological Treatment of Solid and Hazardous Waste Composting; bio-reactors; anaerobic decomposition of solid waste; principles of biodegradation of toxic waste; oxidative and reductive processes; slurry phase bioreactor; in-situ remediation	12
3.	Landfill design : Landfill design for solid and hazardous wastes;	6
4.	Relevant Regulations Municipal solid waste rules; hazardous waste (management and handling) rules; biomedical waste handling rules; fly ash rules; recycled plastics usage rules; batteries (management and handling) rules,	12

Suggested books:

1. John Pichtel Waste Management Practices CRC Press, Taylor and Francis Group 2005.
2. LaGrega, M.D. Buckingham, P.L. and Evans, J.C. Hazardous Waste Management, McGraw Hill International Editions, New York, 1994.
3. Richard J. Watts, Hazardous Wastes - Sources, Pathways, Receptors John Wiley and Sons, New York, 1997.



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Civil Engineering			
CE513	Hydropower engineering	L	T
		3	0

Detail Syllabus:

MODULE	CONTENTS	Hrs
1.	Introduction: Sources of energy, advantages of hydropower, Hydropower development in India and the world. Future of Hydro-Power requirements: Load studies, nature of load; load curve, load factor, capacity factor, utilization factor, diversity factor, load duration curve, firm power, secondary power, prediction of load, power potential of a	10
2.	Types of Hydropower Plants and Principal Components: Classification of hydel power plants, Runoff-river plants, storage plants, pumped storage plants, High head, medium head, low head developments, Base load, peak load developments. Components: reservoir, fore bays,	10
3.	Water Conveyance: Classification of penstocks, design criteria for penstocks, economical diameter of penstocks, number of penstocks and equivalent penstock diameter, pressure conduits in rocks or concrete. Turbines: Main types of turbines, selection,	10
4.	Power House Planning: Underground power house: location, types, components, types of layout, limitations Surface power house: power house structure, dimensions, lighting and ventilation, Variations in the design of power house. Tidal power: Basic principle, location of tidal power plant, difficulties in tidal power generation, components of Tidal power plant; modes of generation,	10
5	Introduction to Integrated Power Development: Steam power versus hydropower, combined operation of hydropower and thermal power plants, economic feasibility. Solar power	6

Suggested books:

1. M.M. Dandekar and K.N. Sharma, "Water Power Engineering", Vikas Publishing House, NewDelhi.
2. M. M. Deshmukh, "Water Power Engineering", DhanpatRai and Sons, NewDelhi.

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3. P. S. Nigam, "Handbook of Hydro Electric Engineering", Nem Chand & Bros.,Roorkee



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Civil Engineering			
CE514	Advance surveying	L	T
		3	0

Detail Syllabus:

MODULE	CONTENTS	Hrs
1.	Field Astronomy: Introduction, purposes, astronomical terms, Astronomical coordinate system, astronomical triangle, determination of azimuth, declination & hour angle, different types of time, LMT, ST & GMT and	12
2.	Aerial photogrammetry: Introduction, Principle, Uses, Aerial & terrestrial photographs, Scale of vertical and tilted photograph, photographic mapping- mapping using paper prints, mapping using stereoplottling instruments, mosaics, map substitutes.	10
3.	Remote Sensing And Geographical Information System: Introduction, Electromagnetic spectrum, Principles of energy interaction in atmosphere and earth surface, Image interpretation techniques, digital satellite data; Global Positioning system: Definition of GIS, Key Components of GIS, Functions of GIS, Spatial data, spatial information system, Geospatial analysis, Integration of Remote sensing & GIS and Applications in Civil Engineering	12
4.	Hydrographic surveying: Introduction, shoreline survey, sounding method of locating sounding, Three point problem.	10

Suggested books:

1. Surveying Vol. II and III by Dr. B.C. Punamia, Laxmi Publishers. NewDelhi
2. Surveying Vol. II and III by Dr. K.R. Arora, Standard Book House. NewDelhi
3. Advanced Surveying by R. Agor, Khanna Publishers, NewDelhi
4. Remote Sensing and GIS by B Bhatia, Oxford University Press, NewDelhi.
5. Remote sensing and Image interpretation by T.M Lillesand,. R.W Kiefer,. and J.W Chipman, 5th edition, John Wiley and SonsIndia



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Civil Engineering			
CE515	Water resources system	L	T
		3	0

Detail Syllabus:

MODULE	CONTENTS	Hrs
1.	Introduction and Basic Concepts: Introduction, System Components, Planning and management, Concept of a system, Advantages and limitations of systems approach, Modeling of Water Resources Systems, Simulation and optimization, Economics in water resources, Challenges	6
2.	Linear Programming and Applications: General form of LP, Standard and Canonical forms of LP, Elementary transformations, Graphical method, Feasible and infeasible solutions, Simplex method, Dual and sensitivity analysis, LP problem formulation, Reservoir sizing and Reservoir operation using LP	8
3.	Simulation: Introduction, River basin simulation, Reservoir operation simulation, Performance evaluation - Reliability, Resiliency and Vulnerability, Some	4
4.	Water Resources Systems Modeling: River basin planning and management, Water distribution systems, Groundwater systems, Water quality modeling, Floodplain management,	8

Suggested books:

1. Loucks D.P, Stedinger J.R and Haith D.A, 'Water Resources Systems Planning and Analysis', Prentice Hall, USA, 1981.

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Civil Engineering			
CE521	Steel Structures-I	L	T
		3	0

Detail Syllabus:

MODULE	CONTENTS	Hrs
1.	Introduction to steel structures and IS 800-2007- Material specifications - Rolled sections – Section classifications - Design approach; design philosophy, i.e. loading load combination, factor of safety, permissible and working	6
2.	Connections: riveted, bolted and welded connections, strength	8
3.	Tension member: rolled sections and built-up sections,	8
4	Compression members - Slenderness ratio – Design - Simple and	10
5.	Flexural members – Rolled sections - built-up beams - Design for strength and serviceability, web crippling,	8
6.	BEAM column: stability consideration, interaction formulae and Column bases: stability of base, gusseted base and grillage footing	8

Suggested books:

1. Subramanian N, Design of Steel Structures, Oxford University Press, New Delhi 2008.
2. Dayaratnam P, Design of Steel Structures, S. Chand & Co., New Delhi, 2003.
3. Arya, A.S and Ajmani, A.L., Design of Steel Structures, Nemchand and brothers, Roorkee, 1992..
4. Punmia, B.C., Ashok Kumar Jain and Arun Kumar Jain. Comprehensive Design of Steel Structures, Laxmi Publications Pvt. Ltd., New Delhi 2000.
5. IS 800-2007, Code of practice for general construction in steel, Bureau of Indian Standards, New Delhi.

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Civil Engineering			
CE522	Advance Geotechnical	L	T
		3	0

Detail Syllabus:

MODULE	CONTENTS	Hrs
1.	Dewatering: Methods. selection, analysis and design of dewatering system.	6
2.	Grouting Types of grouts and their properties; Methods of grouting; Grout selection and control.	8
3.	Compaction Diffused double layer theory of compaction; 'Methods of compaction; Engineering properties of compact soil; Field compaction and its control.	8
4	Soil Stabilization: Stabilization using chemical additives and other method	8
5.	R e i n f o r c e d E a r t h Concept, materials, application and design of reinforced earth wall.	8

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Civil Engineering			
CE523	Industrial Structures	L	T
		3	0

Detail Syllabus:

MODULE	CONTENTS	Hrs
1.	Industrial steel building frames: Types of frames, bracing, crane	6
2.	Transmission and Communication towers: Types and configuration, Analysis and design; Chimneys; Loads and stresses in chimney shaft, Earthquake and wind effect, Stresses due to temperature difference, combined effect of loads and temperature	10
3.	Silos and Bunkers; Jassen's theory, Airy's theory, Shallow and deep bins, Rectangular bunkers with slopping bottom, Rectangular bunkers with highside walls, Steel stacks; introduction, force acting on a steel stack,	12
4	Concrete Shell Structures: Folded plate and cylindrical shell structures; Introduction, structural behaviour of long and short shells, beam and arch action, analysis and design of	10
5.	Machine foundations; introduction, machine vibration, structural design of foundation to rotary machines, impact machines, vibration characteristics, design consideration of foundation to impact machine, grillage, pile and raft	10

Suggested books:

1. 1.Design of Steel Structures, Arya and Azmani, Nem Chand Brothers, Roorkee,2004
2. Punmia B.C, Ashok Kr. Jain, Arun Kr. Jain, RCC Designs (Reinforced Concrete Design), 10th Edition, Lakshmi Publishers,2006.
3. Ramachandra, Design of Steel Structures, 12th Edition, Standard Publishers,2009.



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Civil Engineering			
CE524	Design of Structural Systems	L	T
		3	0

Detail Syllabus:

MODULE	CONTENTS	Hrs
1.	Classification of structural systems, Loads, assumptions and	10
2.	The whole structural design process including definition of functional requirements, selection of structural scheme	18
3.	Formulation of design criteria, preliminary and computer-aided proportioning, and analysis of response, cost, and value.	18

Suggested books:

1. Structural Stability - Theory and Implementation by W.F.Chen and E.M.Lui byElsevier.
2. Reeve,D., Chadwick, A. and Fleming, C. Coastal Engineering-Processes, theory and design practice, Spon Press, Taylor & Francis Group, London &Paris,2004.



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Civil Engineering			
CE525	Geotechnical	L	T
		3	0

Detail Syllabus:

MODULE	CONTENTS	Hrs
1.	Subsurface site evaluation; Use of geophysical methods in sub-soil exploration, seismic survey method, Use of	12
2.	Integrated design of retaining walls, Design of sheet pile wall,	12
3.	Foundations, pavements, and materials for airports, highways, dams, or other facilities. Various factors affecting the	8
4.	Requirements of compaction and compressibility for designof	6

Reference Books

1. Analysis and Design of Substructures: Limit State Design by Swami Saran



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Civil Engineering			
CE526	Environmental Geo-technology	L	T
		3	0

Detail Syllabus:

MODULE	CONTENTS	Hrs
1.	A consideration of technical and scientific aspects of key geo-	8
2.	Case studies and analysis of current and historic databases will be used to illustrate topics including impact of climate change, energy resources, water and soil pollution, and	16
3.	Influence of disposal of industrial and construction waste on the	12
4.	Effect and impact of effluent from chemical and mining industries on ground water, Design of clay liners	8

Reference Books:

1. Introduction to Environmental Geotechnology by Hsai – YangFang
2. CDEEP, IITB video lectures on course CE 488 and CE 641 by Prof. D. N.Singh



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Civil Engineering			
CE531	Air Pollution & its Control Measures	L	T
		3	0

Detail Syllabus:

MODULE	CONTENTS	Hrs
1.	Air pollutants, Sources, classification, Combustion Processes and pollutant emission, Effects on Health, vegetation, materials and atmosphere	8
2.	Reactions of pollutants in the atmosphere and their effects- Smoke, smog and ozone layer Disturbance, Greenhouse	8
3.	Air sampling and pollution measurement methods, principles and instruments, Ambient air quality and emission	8
4.	Meteorology: wind profiles, topographical effects, inversion & plume behavior, plume rise – stable and unstable	8
5.	Air Act, legislation and regulations, control principles,	4
6.	Removal of gaseous pollutants by adsorption, absorption, reaction and other methods, Particulate emission control, settling chambers, cyclone separation, Wet collectors, fabric filters, electrostatic precipitators and other removal methods like absorption, adsorption,	12

Reference Books:

1. Colls, J., Air Pollution: Measurement, Modeling and Mitigation, CRC Press,2009.
2. Noel, D. N., Air Pollution Control Engineering, Tata McGraw Hill Publishers,1999.
3. Stern, A.C., Fundamentals of Air Pollution, Academic Press,1984.



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Civil Engineering			
CE532	Advance Engineering System	L	T
		3	0

Detail Syllabus:

MODULE	CONTENTS	Hrs
1.	Equations of motion for simple physical system. mechanical,	10
2.	Equations of motion for simple heat, conduction and fluid system. Analogies. Equations of motion for mechanical system in two and three dimension. Dynamic response of	12
3.	Forced oscillations of elementary systems. Dynamic stability of compound system. Total response of compound	12



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Civil Engineering			
CE533	Global Positioning System	L	T
		3	0

Detail Syllabus:

MODULE	CONTENTS	Hrs
1.	Overview of GPS – Development of Global Surveying Techniques, History of GPS, New Satellite Navigations constellations, Basic concept of GPS, Space, Control and User segments.	8
2.	GPS Observables – Structure of GPS Signal, Frequency, P Code, C/A code and data format, Generation of C/A code Navigation data bits Pseudo range measurements, Phase measurements, system accuracy characteristics, DOP, Data format	8
3.	Surveying with GPS–Planning a GPS Survey, Positioning methods – point positioning, relative positioning, Static, Fast static, RTK, Differential Positioning, Post processing, real-time processing,	8
4	Accuracy measures, software modules, Network adjustments, Dilution of Precision.	8
5	Applications of GPS – General Uses of GPS, Attitude determination, Interoperability of GPS. Future of GPS – Modernization plans of navigational satellites, Hardware and software improvements.	8

Reference Books:

1. Bradford W. Parkinson, James Spilker, Global Positioning System: Theory and Applications, Vol. I, 1996.
2. Gunter Seeber, Satellite Geodesy Foundations, Methods and Applications, Walter de Gruyter Pub., 2003.
3. Hofmann W.B, Lichtenegger, H, Collins, J Global Positioning System – Theory and Practice, Springer-VerlagWein, 2001.

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Civil Engineering			
CE534	Disaster Management	L	T
		3	0

Detail Syllabus:

MODULE	CONTENTS	Hrs
1.	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 –	8
2.	Disaster Management Mechanism: Concepts of risk management and crisis managements – Disaster Management Cycle – Response and Recovery – Development, Prevention, Mitigation and Preparedness – Planning for Relief	8
3.	Capacity Building: Capacity Building: Concept – Structural and Nonstructural 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	8
4	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	8
5	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	8

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



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Civil Engineering			
CE535	Environmental Management System	L	T
		3	0

Detail Syllabus:

MODULE	CONTENTS	Hrs
1.	Environmental Management System in Industry : Quality of environment. ISO 14000 Environment standards, EMS model. Policy planning process, implementation and operation in industry.	8
2.	Environmental Pollution & Control Techniques: Definition of pollution, pollutant and significance of pollution of pollution control. Types of environment pollution: air, water and land pollution and control.	8
3.	Hazardous waste management system : landfill as incineration, environment problems and solution Concept of Restoration Ecology and Reclamation of degraded land.	8
4	Environment Impact Assessment and Audits : Basic concept of EIA, Needs for EIA and Methods. Introduction and Significance of Environment Audit. Audit regulations, standards and protocols. Setting up EIA and Audit Division in Industry.	8
5	Disasters and their management: Introduction of disasters, Classification and sub types of disasters. Industrial disasters and related case studies. Precautions of SHE in disaster management. Role of SHE in disaster management	8