

CE406C : DISASTER MANAGEMENT

B. Tech. 4th Year (Semester - VIII)

L T P Credits
3 - - 3

Class Work : 25 Marks
Examination : 75 Marks
Total : 100 Marks
Duration of Examination : 3 Hours

Course Outcomes :

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

CO1	Knowledge of the significance of disaster management,
CO2	Analyze the occurrences, reasons and mechanism of various types of disaster
CO3	Understand the preventive measures as Civil Engineer with latest codal provisions
CO4	Apply the latest technology in mitigation of disasters

Prepare CO-PO/PSO Articulation Matrix, e.g.:

	PO1	PO2	PO3	PO4	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	1	1	2	2	1	-	1	1	1	-	2	3	2
CO2	3	3	1	2	1	1	1	1	2	1	1	1	3	2
CO3	2	2	3	2	2	2	-	1	-	2	-	2	3	2
CO4	2	2	3	1	1	1	2	1	1	1	-	2	3	2

Unit-I

Introduction to Disaster Management: Disaster, Emergency, Hazard, Mitigation, Disaster Prevention, Preparedness and Rehabilitation, Risk and Vulnerability, Classification of Disaster, Natural and Man-made Disasters, International day and Decade of Disaster Reduction.

Risk and Vulnerability to disaster mitigation and management options: Warning and Forecasting.

Unit-II

Hydro-meteorological based disasters I: Disaster Management Act 2005, Role of NDMA, NDRF, NIDM, Tropical Cyclones, Floods, droughts, mechanism, causes, role of Indian Metrological Department, Central Water Commission, structure and their impacts, classifications, vulnerability, Early Warning System, Forecasting, Flood Warning System, Drought Indicators, recurrence and declaration, Structural and Non-structural Measures.

Hydro-meteorological based disasters II: Desertification Zones, causes and impacts of desertification, Characteristics, Vulnerability to India and Steps taken to combat desertification, Forest Fires; Causes of Forest Fires; Impact of Forest Fires, Prevention.

Unit-III

Geological based disasters: Earthquake, Reasons, Compression, Shear, Rayleigh and Love Waves; Magnitude and Intensity Scales, Direct and Indirect Impact of Earthquake; Seismic Zones in India, Factors, Indian Standards Guidelines for RCC and Masonry Structures, Prevention and Preparedness for Earthquake, Tsunamis, Landslides and avalanches: Definition, causes and structure; past lesson learnt and measures taken; their Characteristic features, Impact and prevention, Atlas (BMTRPC); structural and non structural measures.

Civil Engg.: Approved in 16th meeting of Academic Council B. Tech.4th Year (VII & VIII semesters only) held on 06.10.2021. applicable to all students admitted in 2018-19 & onwards and trailing students.

Manmade Disasters I: Chemical Industrial hazards; causes and factors, pre- and post disaster measures; control ; Indian Standard Guidelines and Compliance;

Unit-IV

Traffic accidents; classification and impact, Fire hazards; Classification as per Indian Standards; Fire risk assessment; Escape routes; fire fighting equipments; classification of buildings, fire zones, occupancy loads; .capacity and arrangements of exists,
Use of remote sensing and GIS in disaster mitigation and management.

Text Books

1. Thomas D. Schneid., Disaster Management and Preparedness, CRC Publication, USA, 2001
2. Patrick Leon Abbott, Natural Disasters, Amazon Publications, 2002
3. Ben Wisner., At Risk: Natural Hazards, People vulnerability and Disaster, Amazon Publications, 2001
4. Oosterom, Petervan, Zlatanova, Siyka, Fendel, Elfriede M., "Geo-information for Disaster Management", Springer Publications, 2005
5. Savindra Singh and Jeetendra Singh, Disaster Management, Pravalika Publications, Allahabad
6. Nidhi GaubaDhawan and AmbrinaSardar Khan, Disaster Management and Preparedness, CBS Publishers & Distribution

Reference Books

1. Selected Resources Published by the National Disaster Management Institute of Home Affairs, Govt. of India, New Delhi.

NOTE: 1.For the semester examination, nine questions are to be set by the examiner. Question no. 9, containing 5-7 short answer type questions, will be compulsory & based on the entire syllabus. Rest of the eight questions are to be set by setting two questions from each of the four units of the syllabus. The candidates will be required to attempt five questions in all, selecting one from each unit AND Question no. 9. All questions will carry equal marks.

2.The students will be allowed to use non-programmable scientific calculator. However, sharing / exchange of calculator or any other items are prohibited in the examinations. No programmable calculators, mobile phones or other electrical/ electronic items are allowed in the examination.

NOTE: For examiner for paper setting:- In semester examinations, examiner is required to set up question paper covering the entire syllabus in accordance with the examination reforms circulated by the AICTE & approved under item No. 14_18 of academic council.

CE466C : CONSTRUCTION EQUIPMENT AND AUTOMATION
B. Tech. 4th Year (Semester-VIII)

L	T	P	Credits
3	-	-	3

Class Work	: 25 Marks
Examination	: 75 Marks
Total	: 100 Marks
Duration of Examination	: 3 hours

Course Outcomes:

Students will know about:

- 1: Different types of equipments used for foundations and their applications.
- 2: Formwork used in construction.
- 3: Prefabrication and its application in construction.
- 4: Different methods of prestressing.
- 5: Advanced techniques used for construction of pavement

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	1	-	-	3	2	1	1	2	1	1	3	2	3	2
CO2	2	1	-	-	3	3	1	1	2	2	1	3	2	3	2
CO3	1	1	-	-	3	2	1	1	2	1	1	3	2	3	2
CO4	1	1	-	-	3	2	1	1	2	1	1	2	2	3	2
CO5	1	1	-	-	3	2	1	1	2	1	1	3	2	3	2

Unit-I

Foundations: Techniques of construction of piles, Cessions, Wells, Cofferdams and diaphragms, Drilling blasting, Underpinning, Shoring and shuttering of foundation.

Unit-II

Formwork: Design and construction of different types of formworks and temporary structures, Stationary and slip formwork techniques, Formwork of special structures eg. Shells, Bridges, Towers etc.

Steel Construction: Shop and insitu construction techniques, Different connections, Clearances and tolerances, Erection of steel structures like bridges. Chimneys and trusses.

Unit-III

Prefabrication: Modular construction and standardization, Special equipments and plants for industrial production of prefabricated components.

Prestressing: Special equipments and plants for industrial production of prestressed components, Prestressing of bridge girders, Water tanks and special structures.

Unit-IV

Advanced pavement construction Techniques: Pavement construction using bitumen hot mix plant, Concrete road construction, Fibre reinforced pavement construction, Low cost road construction techniques.

B. Tech.4th Year (VII & VIII semesters only) Civil Engg.: Approved in 16th meeting of Academic Council held on 06.10.2021. applicable to all students admitted in 2018-19 & onwards and trailing students.

CE 460C : RURAL WATER SUPPLY AND ONSITE SANITATION SYSTEMS

B. Tech. 4th Year (Semester – VIII)

L T P Credits
3 - - 3

Class Work : 25 Marks
Examination : 75 Marks
Total : 100 Marks
Duration of : 3 Hours
Examination

Course outcomes:

Upon successful completion of the course students will be able to

CO1	Design schemes for rural water supply.
CO2	Design schemes for distribution of water in rural areas.
CO3	Identify the simple methods for waste water treatment.
CO4	Plan schemes for final disposal of solid waste generated from sludge.

Prepare CO-PO/PSO Articulation Matrix, e.g.:

	PO1	PO2	PO3	PO4	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	3	3	3	2	3	3	2	3	3	3	3	3	3
CO2	3	3	3	2	3	3	2	3	3	3	3	3	3
CO3	1	2	1	3	3	3	1	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3	3	3	3

Unit-I

Concept of environment and scope of sanitation in rural areas. Magnitude of problems of rural water supply and sanitation. Population to be covered, difficulties. National policy.

Water supply: Design population and demand loads. Various approaches of planning of water supply schemes in rural areas. collection of raw water from surface source. Specific practices and problems encountered in rural water supply. Relationships between diseases and water quality, hygiene and sanitation.

Unit-II

Improved methods and compact systems of treatment of surface and ground waters for rural water supply. Brief Details of multi-bottom settlers (MBS), diatomaceous earth filter, cloth filter, slow sand filter, chlorine diffusion cartridges, disinfection systems for rural areas, chlorination, Pumps, pipe materials, appurtenances and improved devices for use in rural water supply. Planning of distribution system in rural areas.

UNIT-III

Community and sanitary latrines. Various methods of collection and disposal of night soil. Planning of waste water collection system in rural areas. Treatment and Disposal of waste water. Compact and simple waste water treatment units and systems in rural areas such as stabilization ponds, septic tanks, Imhoff tank, soak pit etc. Disposal of waste water soakage pits and trenches.

Unit-IV

Disposal of Solid Wastes. Composting, land filling, incineration, Biogas plants, sludge /seepage management systems. Rural health. Other specific issues and problems encountered in rural sanitation

B. Tech. 4th Year (VII & VIII semesters only) Civil Engg.: Approved in 16th meeting of Academic Council held on 06.10.2021. applicable to all students admitted in 2018-19 & onwards and trailing students.

**ECE 406C :INSTRUMENTATION AND SENSOR TECHNOLOGIES FOR CIVIL
ENGINEERING APPLICATIONS
B. Tech. 4th Year (Semester – VIII)**

L	T	P	Credits
3	0	--	3

Class Work	: 25 Marks
Examination	: 75Marks
Total	: 100
	Marks
Duration	of : 3 Hours
Examination	

Course Outcomes:

- Understand the principles of operation and characteristics of instrumentation and integrated sensor systems
- Understand right use of sensors and instruments for differing applications along with limitations
- Recognize and apply measurement best practice and identify ways to improve measurement and evaluation
- Troubleshoot and solve problems in instrumentation and measurement systems and to instill and encourage a questioning culture.

Unit-I

Fundamentals of Measurement and Transducers: Measurement and measuring system. Significance of measurements, methods of measurement, Direct and indirect methods: Classification of instrument, Application of measuring system. Transducers: Introduction, primary and secondary transducers, Active and passive transducer, analog and digital transducer.

Unit-II

Transducers Technologies and Data acquisition: Types of Transducers: Measurement of Strain: Strain Gauge, Stress-Strain relationship, Thermocouples, Measurement of vibration: LVDT, RVDT, Measurement of Thickness, capacitive & resistive transducers, piezo-electric transducers, Hall Effect Transducers, Opto-Electronic Transducers, transducers. *Data acquisition:* Data Acquisition Systems, Analog/Digital/Analog conversion Techniques, General consideration of A/D and D/A conversion, A/D and D/A converters.

Unit-III

Sensing and Instrumentation: Introduction, Basics of Sensors, Primary Sensing Elements, calibration of measuring sensors and instruments: principles of calibration, control of calibration environment, Smart sensors, communication & computation in smart sensors.

Unit-IV

Application of Sensor Technologies: Success stories related to: RFID use at Toll plaza, traffic signal regulation, beam defects detection, stress-strain measurements, automobile speed regulation.

*Approved in 16th meeting of Academic Council
B. Tech. 4th Year (VII & VIII semesters only) Civil Engg.: Approved in 16th meeting of Academic Council
held on 06.10.2021. applicable to all students admitted in 2018-19 & onwards and trailing students.*

CE 404C : ENVIRONMENTAL ENGINEERING – II

B. Tech. 4th Year (Semester – VIII)

L	T	P	Credits
3	0	--	3

Class Work	: 25 Marks
Examination	: 75 Marks
Total	: 100 Marks
Duration of Exam.	: 3 Hours

1. Course outcomes:

Upon successful completion of the course students will be able to

CO1	Determine the characteristics of sewage, its variation in flow due to weather and design of sewer.
CO2	Design sewage treatment units and understand their operation and maintenance.
CO3	Plan the most appropriate techniques for the wastewater disposal on land and in to groundwater.
CO4	Design the low cost wastewater treatment units for sewage disposal.

2. Prepare CO-PO/PSO Articulation Matrix, e.g.:

	PO1	PO2	PO3	PO4	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3
CO1	2	2	3	1	3	3	1	3	2	3	3	3	3
CO2	3	3	3	2	3	3	2	3	1	3	2	3	3
CO3	3	3	3	3	3	3	3	2	3	3	3	2	1
CO4	3	2	3	3	3	3	3	3	3	3	3	3	3

Enter correlation levels 1, 2 or 3 as defined below:

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High) If there is no correlation, put "-"

UNIT – I

Sewerage system: Generation and Estimation of Community Sewage; Flow variations; Storm Water flow; Alternate systems for sewage collection and conveyance; Design of sewers; operation and maintenance of sewers,

Characterization of sewage: Parameters for characterization; Sampling, testing and analysis of sewage; Relative stability and population equivalent; BOD and BOD kinetics.

UNIT – II

Treatment of sewage: Effluents standards; Basic principles of sewage treatment; Introduction to unit operations and processes - primary treatment units such as screening, grit chamber, and Sedimentation tanks. Secondary treatment units such as different types of aerobic suspended and attached growth systems, and tertiary treatment Sludge Handling and disposal – thickening, stabilization, dewatering, drying and disposal

UNIT – III

Sewage treatment units design: ASP, TF, and Pollution due to improper disposal of sewage, Government authorities and their roles in sewerage disposal

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Deenbandhu Chhotu Ram University of Science & Technology, Murthal (Sonapat)
SCHEME OF STUDIES & EXAMINATIONS
B.Tech. Final YEAR (SEMESTER – VIII: CIVIL ENGINEERING)
Tentative Choice Based Credit Scheme w.e.f. 2021-22

Sl. No.	Course No.	Course Title	Teaching Schedule			Marks of Class work	Examination Marks		Total	Credit	Duration of Exam
			L	T	P		Theory	Practical			
10.	CE 402C	IRRIGATION ENGINEERING	3	0		25	75	-	100	3	3
	CE 404C	ENVIRONMENTAL ENGINEERING – II	3	0		25	75	-	100	3	3
3	ECE 404C	INSTRUMENTATION AND SENSOR TECHNOLOGY FOR CIVIL ENGINEERING APPLICATIONS	2	-		25	75	-	100	2	3
4	CE 406C	DISASTER MANAGEMENT	3	-	-	25	75	-	100	3	3
5	CE	DE-III	3	-	-	25	75	-	100	3	3
6	CE	DE-IV	3	-	-	25	75	-	100	3	3
7		DE-III(SP)	4	-	-	25	75	-	100	4	3
8		DE-IV(SP)	4	-	-	25	75	-	100	4	3
9	CE 408C	ENVIRONMENTAL ENGINEERING – II LAB	-	-	2	25		75	100	1	3
10	ECE-486C	INSTRUMENTATION AND SENSOR TECHNOLOGY FOR CIVIL ENGINEERING APPLICATIONS LAB	-	-	2	25		75	100	1	3
11	CE410C OR CE412C	SOFTWARE APPLICATIONS IN STRUCTURE/EARTHQUAKE ENGINEERING LAB** OR SOFTWARE APPLICATIONS IN HIGHWAY ENGINEERING LAB**			4	25		75	100	2	3
12	GFCE402C	GENERAL FITNESS FOR CIVIL ENGINEERING	-	-	-	-	-	75	75	-	3
Total			25	-	8	275	600	300	1175	29	

Note:

- The students will be allowed to use non-programmable scientific calculator. However, sharing/exchange of calculator are prohibited in the examination.
- Electronics gadgets including Cellular phones are not allowed in the examination
- * Assessment of survey camp held after fourth semester.
- DE-III (SP) and DE-IV (SP) For only those students opting for degree with specialization
- Student can undertake 20% of the courses of this scheme (Hons./Minor Degree with Specialization in the above listed emerging areas) through online platforms SWAYAM/MOOCs/NPTEL etc. with due permission of the chairperson.
- Any students of the B. Tech. of the University can opt for this scheme (Hons./Minor Degree with Specialization in the above listed emerging areas), however, minimum 10 students are required for running a particular specialization.

Treated effluent disposal: Disposal into surface water bodies; Reuse for irrigation and aquaculturing; Land disposal; Disposal through injection into groundwater, Indian standards for disposal of effluent.

UNIT – VI

Low cost sanitation systems – Imhoff tanks, septic tank, stabilization ponds; oxidation ponds; and constructed wetland systems.

Pumping: Sewage pumping and pumping stations, Sewer connections for houses and buildings, Sewer appurtenances; Construction, testing and Maintenance of sewers;

Text Books

1. Manual on Water Supply and Treatment by Ministry of Urban Development, New Delhi.
2. Water Supply and Sewerage, McGhee, McGraw Hill.
3. Environmental Engineering, Vol. I, S.K. Garg, Khanna Publishers, New-Delhi.

References Books

1. Environmental Engineering Peavy, Rowe and Tchobanglous, McGraw Hill.
2. Water and Waste Water Engineering (Vol. 1&2), Fair, Geyer & Okun, John Wiley, New York.
3. Water Supply Engineering P.N. Modi, Standard Book House New-Delhi.
4. Standard Methods for the Examination of Water and Waste Water, American Public Health Association

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L	T	P	Credits
3	-	-	3

Class Work	: 25 Marks
Examination	: 75 Marks
Total	: 100 Marks
Duration of Examination	: 3 Hours

Course Outcomes :

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

CO1	The students gain the knowledge needed on hydrologic cycle and precipitation, design of rain gauge station and estimating of various losses of precipitation.
CO2	The students will understand the basics of groundwater and hydraulics of subsurface flows.
CO3	Analyze the water requirement of crops, capacities of Distributaries and Canal.
CO4	Design a canal irrigation system, cross drainage works and their objectives, analyzes dam structures.

Prepare CO-PO/PSO Articulation Matrix, e.g.:

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CO2	2	2	2	1	-	-	2	1	2	2	3	3
CO3	2	2	3	1	1	1	2	2	2	1	3	2
CO4	2	2	3	1	1	2	2	1	2	2	3	2

Unit I

HYDROLOGY: Hydrologic cycle, Precipitation: introduction, forms of precipitation, types of precipitation, measurement of precipitation, selection of rain gauge station. Hyetograph and mass curve of rainfall, Evaporation: Definition, factors affecting, measurement, evaporation control. Evapo-transpiration, Infiltration.

Definition, components of hydrographs, unit hydrograph, base flow separation, Prepositions of unit hydrograph- problems.

Types of Aquifers - Darcy's Law - Dupuit's Assumptions - Confined Aquifer - Unconfined Aquifer - Recuperation Test - Transmissibility - Specific Capacity - Pumping Test - Steady Flow Analysis Only.

Unit II

Soil-water relationship and irrigation methods: Soil-water relationship, root zone soil water, infiltration, consumptive use, field capacity, wilting point, available moisture in soil, Gross Command Area, Culturable Command Area, intensity of irrigation, delta, base period, Kor depth, core period, frequency of irrigation, duty of water, relation between delta, duty and base period, irrigation requirement, Methods of Irrigation-flooding methods, border strip method, check basin and furrow method, assessment of irrigation water, sprinkler irrigation system.

Canal irrigation: Component of canal distribution system, alignment of channels, losses in irrigation channels, design discharge, silt theories and design of alluvial channels, comparison of Kennedy's and Lacey's theories, canal section and design procedure, Garrets and Lacey's diagrams.

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Unit III

Cross Drainage Works: Classification and their selection, Hydraulic Design Aspects of Aqueducts, Syphon Aqueducts, Super Passage, Canal Syphon and Level Crossing, Design of Canal Transitions.

Diversion Canal Headworks: Various components and their functions, layout plan, selection of site for diversion headworks, Causes of failure of weir/barrages on permeable foundation, Bligh's creep theory, Khosla's method of independent variables, use of Khosla's curves, various corrections..

Unit IV

Regulation works: Canal falls-necessity and location, development of falls, design of cistern element, roughening devices. Design of Sarda type fall. Design of straight Glacis fall. Off-take alignment, Cross-Regulator and Distributory Head Regulators, devices to control silt entry into the off-taking channel and Silt Ejector, Canal Escapes. **Dams:** Design principles for gravity and earthen dams

Text Books

1. Irrigation, Water Resources and Water Power Engg. by P.N. Modi.
2. Fundamentals on Irrigation Engg. by Bharat Singh

Reference Books

1. Irrigation Engg & Hydraulic Structures by S.K. Garg.
2. Irrigation Engg. by S.K. Sharma.

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