

**MRSPTU UNDER GRADUATE OPEN ELECTIVES SYLLABUS OFFERED BY
CIVIL ENGG. W.E.F. JAN-2021 ONWARDS**

UG OPEN ELECTIVES		
Internal	External	Total
40	60	100

UG OPEN ELECTIVES		
COURSE CODE	COURSE	NOT APPLICABLE FOR PROGRAMMES
Open Electives offered by Department of Civil Engg.		
BCIEO1-001	Disaster Management	B. Tech. Civil Engg.
BCIEO1-002	Environment Management	
BCIEO1-003	Construction Management	
BCIEO1-004	Traffic Management	

Note: Already uploaded open elective subjects BCIEO-F91, F92, F93, F94, F95, F96, F97, F98, F99 and F9A offered by Civil Engg. Department stands discarded w.e.f. Jan-2021 onwards.

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DISASTER MANAGEMENT			
Subject Code: BCIEO1-001	L T P C	Duration: 45 Hrs.	
	3 0 0 3		
Course Objectives:			
<ol style="list-style-type: none">1. To introduce the students to various types of natural and manmade disasters.2. To learn about components of disaster management cycle and framework.3. To learn about disaster management activities in India at the national, state, and local level.4. To familiarize the students about applications of science and technology in disaster management.			
Course Outcomes:			
<ol style="list-style-type: none">1. Student is introduced to various types of natural and manmade disasters.2. Student is able to learn about components of disaster management cycle and framework.3. Student learns about disaster management activities in India at the national, state, and local level.4. Student is able to learn about applications of science and technology in disaster management.			
UNIT-I (12 Hours)			
Concepts and definition of Disaster, Hazard, Vulnerability, Risk, Capacity – Disaster and Development. Types, Trends, Causes, Consequences and Control of Disasters, Geological Disasters (earthquakes, landslides, tsunami, mining); Hydro-Meteorological Disasters (floods, cyclones, lightning, thunder-storms, hail storms, avalanches, droughts, cold and heat waves), Biological Disasters (epidemics, pest attacks, forest fire), Technological Disasters (chemical, industrial, radiological, nuclear) and Manmade Disasters (building collapse, rural and urban fire, road and rail accidents, nuclear, radiological, chemicals and biological disasters), Global Disaster Trends – Emerging Risks of Disasters – Climate Change and Urban Disasters.			
UNIT-II (11 Hours)			
Disaster Management Cycle and Framework, Paradigm Shift in Disaster Management, Pre-Disaster – Risk Assessment and Analysis, Risk Mapping, zonation and Micro-zonation, Prevention and Mitigation of Disasters, Early Warning System; Preparedness, Capacity Development; Awareness During Disaster – Evacuation – Disaster Communication – Search and Rescue – Emergency Operation Centre – Incident Command System – Relief and Rehabilitation Post-disaster – Damage and Needs Assessment, Restoration of Critical Infrastructure – Early Recovery – Reconstruction and Redevelopment.			
UNIT-III (11 Hours)			
Disaster Management in India, Disaster Profile of India – Mega Disasters of India and Lessons Learnt, Disaster Management Act 2005 – Institutional and Financial Mechanism, National Policy on Disaster Management, National Guidelines and Plans on Disaster Management; Role of Government (local, state and national), Non-Government and Inter Governmental Agencies.			
UNIT-IV (11 Hours)			
Applications of Science and Technology for Disaster Management, Geo-informatics in Disaster Management (RS, GIS, GPS and RS) Disaster Communication System (Early Warning and Its Dissemination), Land Use Planning and Development Regulations, Disaster Safe Designs and Constructions, Structural and Non-Structural Mitigation of Disasters, S&T Institutions for Disaster Management in India.			
Recommended Text Books / Reference Books:			
<ol style="list-style-type: none">1. Manual on Natural Disaster Management in India, M C Gupta, NIDM, New Delhi.			

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2. An Overview on Natural & Man-made Disasters and their Reduction, R K Bhandani, CSIR, New Delhi.
3. Disaster Management Policy and Administration, S L Goyal, Deep & Deep, New Delhi, 2006
4. Management of Natural Disasters in Developing Countries, H.N. Srivastava & G.D. Gupta, Daya Publishers, Delhi, 2006.
5. Disaster Management Act 2005, Published by Govt. of India.
6. National Disaster Management Policy, 2009, Published by Govt. of India.

ENVIRONMENT MANAGEMENT

Subject Code: BCIEO1-002

L T P C
3 0 0 3

Duration: 45 Hrs.

Course Objectives:

The course should enable the students to:

1. Global environmental issues and their Management.
2. Green technologies for cleaner production.
3. Major principles and steps required in environmental impact assessment.
4. Causes of land degradation, biodiversity loss and methods of their management.

Course Outcomes:

1. An ability to understand the major global environmental issues, their causes, sources, management and laws/policies related to these technologies involved in eco-friendly production and mechanism of carbon credits.
2. An ability to understand the major principles of environmental impact assessment.
3. An ability to understand the implications of current rules and regulations in relation to environmental impact assessment.
4. An ability to understand the causes, implications and management of local environmental issues like land degradation, wasteland and water logging.

UNIT-I (12 Hours)

Global Environmental Problems: Global warming, green-house effect, ozone depletion, acid rain, oil pollution, radiation hazard and control, global climate change. Main clauses and basic steps for Environmental Management System certification. Environmental Laws/Acts.

UNIT-II (11 Hours)

Cleaner Production Technologies Need and benefits, cleaner production techniques and options, zero impact manufacturing initiatives CDM and carbon credits/case studies.

UNIT-III (11 Hours)

Environment Impact Assessment: Definition and its importance for environment management, constituents of environment impact assessment, project data for EIA study, prediction of impacts, EIA methodologies, constraints in implementation of EIA, impact prediction on water resources projects and other relevant case studies. Environment pollution.

UNIT-IV (11 Hours)

Degradation of Land Resources: Deforestation: Forest land, deforestation and its effects on land use and Environmental quality, wetland and their importance in environment, causes and extent of wasteland, Soil degradation problems, erosion, salinization, water logging, land use management & planning.

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Recommended Text Books / Reference Books:

1. Peavy, Rowe, 'Techobanoglous, Environmental Engg.' Tata McGraw Hill.
2. Mackenzie L. Davis, 'Environmental Engg.' Tata McGraw Hill.
3. Baljeet S. Kapoor; 'Environmental Engg. An overview', Khanna Publishers.
4. Gilbert H. Masters, 'Environmental Engineering and Science', Prentice Hall of India Pvt. Ltd.
5. G.N. Panday, G.C. Carney Environmental Engineering, Tata McGraw Hill.
6. P.D. Sharma, Ecology and Environment, Rastogi Publications.
7. P.A. Ray, Lcances, 'Environmental Impact Assessment', Hand National Environmental Protection Council, Manile.

CONSTRUCTION MANAGEMENT

Subject Code: BCIEO1-003	L T P C	Duration: 45 Hrs.
	3 0 0 3	

Course Objectives:

1. To train the students with the latest and the best in the rapidly changing fields of Construction Engineering, Technology and Management.
2. To prepare the students to be industry leaders who implement the best engineering and management practices and technologies in the construction industry.
3. To continually work with industry to enhance the program's effectiveness and the opportunities for innovation in the construction industry.
4. To conduct research to develop advanced technologies and management approaches.

Course Outcomes:

1. Be able to apply theoretical and practical aspects of project management techniques to achieve project goals.
2. Possess organizational and leadership capabilities for effective management of construction projects.
3. Be able to apply knowledge and skills of modern construction practices and techniques.
4. Have necessary knowledge and skills in accounting, financing, risk analysis and contracting.
5. Be capable of using relevant software packages for planning, scheduling, executing and controlling of construction projects.

UNIT-I (12 Hours)

GENERAL MANAGEMENT: Introduction and characteristics of management, Principle and function management, Scientific of management.

CONSTRUCTION MANAGEMENT: Definition, functions and scope of construction management; scientific methods of management, construction team.

UNIT-II (11 Hours)

MANPOWER PLANNING: Manpower Planning process, Role of HR manager, Personnel Principles, Managerial Staffing, Recruitment Selection strategies.

HUMAN RELATIONS AND ORGANISATIONAL BEHAVIOUR: Introduction & Significance, Basic individual psychology, Conflicts in organizations, Engineer as Manager, Communication and negotiation skills.

UNIT-III (11 Hours)

MATERIALS MANAGEMENT: Scope, Objective and functions of material management, Procurement and store management, Materials handling management, Inventory control and management, Disposal of Surplus Materials.

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<p>CONSTRUCTION PLANNING: Basic Concepts in the Development of Construction Plans, Choice of Technology and Construction Method, Estimating Activity Durations & Resource Requirements for Work Activities.</p>
<p>UNIT-IV (11 Hours)</p>
<p>CONSTRUCTION CONTRACTS: Indian Contracts Act, Elements of Contracts, Types of Contracts, Features, Suitability, Design of Contract Documents, International Contract Document, Standard Contract Document.</p> <p>SITE LAYOUT: Principles governing site lay out, factors effecting site lay out, preparation of site lay out, Feasibility study, project reports, progress reports, monitoring and controlling construction activities.</p>
<p>Recommended Text Books / Reference Books:</p> <ol style="list-style-type: none"> 1. Mahesh Verma, 'Construction Equipment and its Planning and Application'. 2. R.L. Peuripo, 'Construction Planning Equipment and Methods', Tata McGraw Hill. 3. Calin M. Popescu, Chotchai Charoenngam, "Project Planning, Scheduling and Control in Construction: An Encyclopedia of terms and Applications", Wiley, New York, 1995. 4. Chitkara, K.K. "Construction Project Management: Planning, Scheduling and Control", McGraw-Hill Publishing Company, New Delhi, 1998 5. Carleton Counter II and Jill Justice Coutler, "The Complete Standard Handbook of Construction Personnel Management", Prentice-Hall, Inc., 1989.

TRAFFIC MANAGEMENT			
Subject Code: BCIEO1-004	L T P C		Duration: 45 Hrs.
	3 0 0 3		
<p>Course Objectives:</p> <ol style="list-style-type: none"> 1. To introduce the students to various interacting elements of road traffic. 2. To learn about traffic facilities for road users and engineering studies for traffic management. 3. To learn about traffic and road facilities, and intersection control measures for smooth traffic movement. 4. To familiarize the students with ITS user services for traffic management. <p>Course Outcomes:</p> <ol style="list-style-type: none"> 1. Student is able to learn about various interacting elements of road traffic. 2. Student is able to learn about traffic and road facilities, and engineering studies for traffic management 3. Student learns about traffic and road facilities, and intersection control measures for smooth traffic movement. 4. Student is able to learn about ITS user needs and services like vehicle fleet management and public transportation management. 			
<p>UNIT-I (10 Hours)</p>			
<p>Introduction, Components of Road Traffic – Vehicle, Driver and Road, Road User and Vehicle Characteristics and their effect on Road Traffic, IRC standards - Design speed, volume. Highway capacity and levels of service - capacity of urban and rural roads - PCU concept.</p>			
<p>UNIT-II (11 Hours)</p>			
<p>Road user facilities – Parking facilities - Cycle tracks and cycleway - Pedestrian facilities. Traffic volume studies, origin destination studies, speed studies, travel time and delay studies, Parking studies, Accident studies.</p>			

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UNIT-III (12 Hours)

Traffic regulation and control – Road signs and markings, At-grade intersections, Roundabouts, Traffic signals - pre-timed and traffic actuated, Grade separated intersections, access-controlled highways and expressways, Traffic Safety, Road Safety Audit.

UNIT-IV (12 Hours)

Intelligent Transportation Systems (ITS), Benefits of ITS, Data collection techniques, ITS User Needs and Services – Travel and Traffic management, Public Transportation Management, Electronic Payment, Commercial Vehicle Operations, Emergency Management, Advanced Vehicle safety systems, Information Management.

Recommended Text Books / Reference Books:

1. Pignataro, L., Traffic Engineering – Theory & Practice, John Wiley.
2. Kadiyali, L.R., Traffic Engineering and Transport Planning, Khanna publishers.
3. O’Flaherty C A, Highways- Traffic Planning & Engineering, Edward Arnold, UK.
4. Chowdhury, M. A., and Sadek, A., Fundamentals of Intelligent Transportation Systems Planning, Artech House.
5. Sussman, J. M., Perspectives on Intelligent Transportation Systems (ITS), Springer.
6. Turban, E., and Aronson, J. E., Decision Support Systems & Intelligent Systems, Prentice Hall.