

GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT

COURSE CURRICULUM

COURSE TITLE: ENVIRONMENTAL PROJECT MANAGEMENT

(COURSE CODE: 3351305)

Diploma Programme in which this course is offered	Semester in which offered
Environmental Engineering	5 th Semester

1. RATIONALE:

One would agree that managing an environmental project is a huge & challenging task, which largely depends on many environmental dimensions of the project. For environmental technicians/engineers it is important & essential to know some basics of ‘project management’ along with some critical aspects of environment management, safety, hazards etc. As environmental professionals they are expected to know the managerial aspects involved in industries like management of labor and materials for smooth completion of the project. Knowledge about elements of EMS i.e. ISO 14000 is also important to be a good environmental manager. This course deals with general aspects of project management & environmental management system. In this course students are expected to learn the application of some software for Environmental Project Management. It is therefore a very important course.

2. LIST OF COMPETENCY

The course should be taught and implemented with the aim to develop required skills in students so that they are able to acquire following competency:

- **Plan and execute environmental projects using MIS as per schedule and standards while ensuring quality and safety**

3. COURSE OUTCOME:

The theory should be taught and practical should be carried out in such a manner that students are able to acquire required learning out comes in cognitive, psychomotor and affective domain to demonstrate following course outcomes.

- i. List different environmental organizations and draw the linkage /connections among them
- ii. Communicate technical information accurately and effectively in oral, written, visual and electronic forms.
- iii. Discuss safe working practices using examples/cases/video programmes
- iv. Use information management systems (e.g., spreadsheets, word-processing, Geographical Information System (GIS) software packages) proficiently.
- v. Search, collect, and retrieve project-related information, using information

- technology tools.
- vi. Use statistical software to organize, summarize and present environmental project related data.
 - vii. Describe established standards & procedures in support of environmental management systems.
 - viii. Discuss key elements of quality assurance (QA) and quality control (QC) and quality management (QM)
 - ix. Explain principles, & appropriate methods of “disaster management”.

4. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)	Examination Schedule				
L	T	P		Theory Marks		Practical Marks		Total Marks
3	0	0	C	ESE	PA	ESE	PA	100
				70	30	00	00	

Legends: L - Lecture; T - Tutorial/Teacher Guided Student Activity; P - Practical; C - Credit; ESE - End Semester Examination; PA - Progressive Assessment

5. COURSE CONTENT DETAIL

Unit	Major Learning Outcomes (in cognitive domain)	Topics And Subtopics
Unit-I Environmental Organizations and EMS	1a. State the role of environmental engineer/technician in EPM 1b. Describe the key role/s of different environmental organizations & their linkage 1c. State the quality and skills required for an ideal manager. 1d. Discuss key principles, elements, methods, implications and continuous improvement aspects of EMS-Environmental Management System ISO-14000 series	1.1 Importance of E P M 1.2 Role of Environmental Engineer in Management 1.3 Quality of good manager 1.4 Skills required for ideal manager 1.5 Different environmental organizations, their roles and linkages. 1.6 Introduction to Environmental standards 1.7 Utility of ISO to the Society 1.8 Introduction to IS- 14000 series 1.9 Environmental Management system (ISO-14000) 1.9..1 Benefits, Key element
Unit-II Planning of Projects	2a Explain the terms related to project planning 2b Describe methods of planning a project with examples. 2c Describe the necessity and importance of site Layout from environmental perspectives.	2.1 Project planning Terms : Change management, Extreme project management, Graphical Evaluation and Review Technique, Integrated Master Plan (IMP), Management process, Project Cost Management, Project management process, Project Management Triangle, Project

	<p>2d State the Importance and steps to prepare Bar chart and CPM</p> <p>2e Calculate the examples on Bar chart and CPM</p> <p>2f Describe the necessity and Parameters to be considered for environment project site layout</p> <p>2g State preparation of site layout for environment project</p>	<p>planning, Work Breakdown Structure (WBS), Timeline</p> <p>2.2 Principles, Requirements, Methods and Parameters effecting Project planning</p> <p>2.3 Project scheduling & controlling</p> <p>2.4 Bar chart and CPM (Importance and preparation)</p> <p>2.5 Examples on Bar chart and CPM</p> <p>2.6 Necessity of site layout</p> <p>2.7 Parameters to be considered while preparing site layout</p> <p>2.8 Preparation of site layout for environment project.</p>
Unit-III Labour & Material Quality Management	<p>3a Describe key features of labor laws in the context of labor management.</p> <p>3b Describe appropriate methods of inspection and testing for ensuring quality of materials.</p> <p>3c Describe the testing methods of materials for quality .</p>	<p>3.1 Labor Characteristics</p> <p>3.2 Incentive & Motivation</p> <p>3.3 Labor laws – Legislation Act,</p> <p>3.4 Wages and Payment Act,</p> <p>3.5 Compensation Act.</p> <p>3.6 Quality of materials Inspection & testing methods – Objectives, Types and Relevant laboratory tests.</p> <p>3.7 Quality parameters in observation</p>
Unit-IV Safety Management	<p>4a. Explain various terms related to safety in Industry.</p> <p>4b. Explain the important operations /procedures of occupational safety & health relating to environmental aspects of projects.</p> <p>4c. State the steps to prevent Fire hazards</p> <p>4d. Describe the Dos and Don't for storing Chemicals</p>	<p>4.1 Preliminary knowledge regarding environmental related safety codes (BIS) for</p> <p>4.1.1 Fire Hazards & its prevention</p> <p>4.1.2 Chemical hazards and its prevention</p> <p>4.1.3 Mechanical, Electrical & radiation hazards.</p> <p>4.1.4 Control of Hazards</p> <p>4.1.5 Through cases/examples/videos Occupational safety.</p> <p>4.1.6 Safety Equipment & Campaign.</p> <p>4.1.7 Storage of Chemicals.</p>
Unit-V Management Information System	<p>5a Explain basics and importance of MIS.</p> <p>5b Classify MIS</p> <p>5c Use appropriate MIS (e.g., spreadsheets, word-processing, Geographical Information System (GIS) ,software packages) for environmental related project data& information.</p> <p>5d Describe the steps to Implement of EPM.</p>	<p>5.1 Function, Purpose & needs and Characteristics</p> <p>5.2 Physical element</p> <p>5.3 Classification</p> <p>5.4 Implementation & Application to EPM.</p>

Unit-VI Disaster Management	6a Describe through cases, programmes / examples various types of disasters and methods used for managing & mitigating the disaster. 6b List activities needed for pre and post-disaster management	6.1 Introduction 6.2 Kinds of Disaster 6.3 Effects of various kinds of disaster 6.4 Socio-economic & culture effects 6.5 Pre disaster management 6.6 Management during and after disaster
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6. SUGGESTED SPECIFICATION TABLE WITH HOURS & MARKS (Theory)

Unit	Unit Title	Teaching Hours	Distribution Of Theory Marks			
			R Level	U Level	A Level	Total Marks
I	Environmental Organizations and EMS	8	03	05	04	12
II	Planning of Projects	10	04	06	06	16
III	Labour & Material Quality Management	10	06	05	05	16
IV	Safety Management	6	04	03	03	10
V	Management Information System	4	02	04	02	08
VI	Disaster Management	4	04	02	02	08
TOTAL		42	23	25	22	70

Legends: R = Remember; U = Understand; A = Apply and above levels (Bloom's revised taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

7. SUGGESTED LIST OF STUDENT ACTIVITIES

Unit No.	Activity/Exercise
I	Prepare environmental organizations chart & their linkages. Prepare site layout after site visit.
I	Prepare a report on various environmental standards with their special features.
II	Draw project scheduling and calculation of cost optimization for any two projects.
III	Study quality management system of some organization and prepare a report
IV	Study safety management system of some environmental organization and prepare a report
V	Study MIS of some environmental organization and prepare a report

VI	Prepare report on various kinds of disasters happened in India with their causes and possible preventive measures.
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8. SPECIAL INSTRUCTIONAL STRATEGIES (If Any):

- i. Arrange Special Expert Lectures on EMS, MIS, QMS (quality management system) PMS (Project Management Systems) etc.
- ii. Video programmes on disasters and its mitigation, occupational safety & health related work practices.
- iii. Arrange field visit to constructional sites and show safety measures, QMS and MIS in use.
- iv. Ask students to have group discussions on successful as well as problematic cases of project planning and execution related to environmental projects.
- v. Discuss various labour laws through real life labour dispute cases.

9. SUGGESTED LEARNING RESOURCES

A. List of Books

Sr. No	Title of Books	Author	Publication
1	A management guide to PERT	Jerome D Weist	
2	Construction Planning and management	P.S.Ghalot & B.M.Dhir	
3	Construction Planning Equipments and methods	R.L.Parifoy	
4	Construction Structure Management	S.C.Rangwala	
5	Project Planning by CPM & Pert	B.C.Punamia & Khandwala	
6	Relevant IS and ISO codes		
7	Construction Management and PWD accounts	B.Lal	
8	Industrial Safety and Environment	Anupama Prashar & Pratibha Bansal	

B. List of Software or Learning Website

- i. www.gpcb.gov.in
- ii. www.cpcb.nic.in/
- iii. www.senecacollege.ca/fulltime/PME.html
www.worldbank.org/projects/.../environmental-management-capacity-bu...

- iv. <http://news.harvard.edu/gazette/section/science-n-health/environment/>
- v. <https://ciser.cornell.edu/sasdoc/saspdf/orpm/chapa.pdf>

10. COURSE CURRICULUM DEVELOPMENT COMMITTEE

Faculty Members from Polytechnics

- **Prof .M.C. Sanandiya**, Lecturer in Environmental Engineering, K. J. Polytechnic, Bharuch

Coordinator and Faculty Members from NITTTR Bhopal

- **Prof. V.H. Radhakrishnan**, Professor, Department of Civil and Environmental Engineering.
- **Prof. Shashi Kant Gupta**. Professor and Coordinator for State of Gujarat.