

Safety Engineering and Disaster Risk Management

BEG 455 CI

Year:4

Semester:II

Teaching Hours/Week			Examination Scheme				Total Marks	
Schedule			Final		Internal Assessments			Total Marks
L	T	P	Theory	Practical	Theory Marks	Practical Marks		
2	1	0	Duration	Marks	Duration	Marks		100
			3	80	--	--	20	

Course Objectives:

This subject has been designed to impart the knowledge to civil engineering students regarding safety in their profession and also the disaster management. After completion of this course, the students will be able to;

- i. Explain the need of safety in civil engineering works,
- ii. Identify various types of hazards and implement the preventive measures,
- iii. Explain the role of various level of workers and officials, regarding safety,
- iv. Identify various types of disaster and implement the preventive measures

Course content:

1.0 Introduction to Safety Engineering

(3 hrs)

- 1.1 Introduction to safety engineering and its Scope
- 1.2 Interrelationships between human/machinery / environmental elements
- 1.3 Impact of human and machine characteristics on safety
- 1.4 Safety control devices; Signs, Signals, Instructions and Safety Codes

2.0 Attitude Towards Safety

(2 hrs)

- 2.1 Attitude towards safety
- 2.1 Attitude Survey
- 2.2 Value of safety survey
- 2.3 Report from safety personal
- 2.4 The interface between safety problems and concerned parties

3.0 Basic Safety Engineering: Hazard Identification

(5 hrs)

- 3.1 Mechanical Energy Hazards: Thermal Energy Hazards
- 3.2 Electrical Energy Hazards: Acoustic Energy Hazards
- 3.3 Chemical Energy Hazards: Radiant Energy Hazards

3.4 Kinetic (Impact) Energy Hazards: Air/Land/Sea Energy Hazards

3.5 Potential (Stored) Energy Hazards: Biological Energy Hazards

4.0 Basic of Safety Engineering: Hazard Evaluation (1 hrs)

4.1 Acceptable vs Unacceptable Risk

5.0 Basic of Safety Engineering: Hazard Control (4 hrs)

5.1 The First Cardinal Rule of hazard control

5.2 The Second Cardinal Rule of hazard control

5.3 Passive vs Active Hazard Control

5.4 The Third Cardinal Rule of hazard control

6.0 Safety Performance (4 hrs)

6.1 Injury Frequencies Survey (ISR-IFR).

6.2 Factors to be considered for Appraising Plant Conditions

7.0 Safety and Health Standards (3 hrs)

7.1 Health hazards in the construction industries

7.2 Government standards of safety and health

7.3 Development of self applied standards

7.4 Regulatory standards

7.5 Plant standards

8.0 Industrial Safety (4 hrs)

8.1 Introduction

8.2 Employer Liability Laws

8.3 Workmen's compensation Laws

8.4 Agencies rendering safety services

8.5 Industrial Relations, Trade Unions and Safety Representatives

9.0 Safety Management (6 hrs)

9.1 Role of Employees

9.2 Role of Supervisors

9.3 Motivating Management

9.4 Stress Management

9.5 Safety Management

9.6 Consideration of human errors

9.7 Contracts and Legislation

10 Disaster Management (2 hrs)

10.1 Introduction

10.2 Types of Disaster

10.3 Government regulation

11.0 Guidelines for Hazard, Risk Assessment and Vulnerability (2 hrs)

12.0 Impact of Natural Disaster on Environment and Development (2 hrs)

13.0 Disaster Mitigation (3 hrs)

13.1 Earthquake

13.2 Floods and debris flow

13.3 Landslides

13.4 Glacier Lake Outcross Flood (GLOF)

13.5 Fire

13.6 Cold and Hot wave

13.7 Avalanche

14.0 Disaster Management Cycle: Prevention, Preparedness, Disaster Response and Recovery (2hrs)

15.0 Disaster Management in Nepal(2hrs)

References:

- “Disaster Management: a disaster manager’s hand book”, Manila: Asian
- Disaster Mitigation in Asia and Pacific”, Manila: Asian Development Bank, 1991.
- Sharma V.K., “ Disaster Management”, National Center fir Disaster Management, Indian Institute Public Administration, 19941
- U.K, Dewan, J.M. “Safety, Security and Risk Management”, APH Corporation, 1996