Module (Course Syllabus) Catalogue

2023-2024

College/ Institute	**Erbil Technology College**	
Department	**Construction & materials technology Engineering**	
Module Name	**CONSTRUCTION SAFETY & ENGINEERING ETHICS**	
Module Code	**CSE481**	
Degree	**Technical Diploma** ☐ **Bachelor** ☒ **High Diploma** ☐ **Master** ☐ **PhD** ☐	
Semester	**8**	
Qualification	**Master-Structures Engineering**	
Scientific Title	**Lecturer**	
ECTS (Credits)	**4**	
Module type	**Prerequisite** ☐ **Core** ☒ **Assist.** ☐	
Weekly hours	**4**	
Weekly hours (Theory)	**(4)hr Class**	**(108)Total hrs Workload**
Weekly hours (Practical)	**( )hr Class**	**( )Total hrs Workload**
Number of Weeks	**16**	
Lecturer (Theory)	**Arsalan H. Hasan**	
E-Mail & Mobile NO.	arsalan.hasan@epu.edu.iq	
Lecturer (Practical)		
E-Mail & Mobile NO.		
Websites		

Course Book

Course Description	**1- Accident statistics in construction industry, most common causes of accidents, legal responsibilities imposed by the Occupational Health and Safety Law on the employer and the engineer, risk assessment, possible legal prosecutions, occupational health and safety management system, accident prevention measures, occupational safety and insurance relationship, engineering ethics and professional responsibility concepts, ethical codes in civil engineering, case studies, classroom discussions.** **2- Increasing awareness of engineers about their responsibilities to the profession and society, to enable them prioritize job safety in both design and in establishing site management systems; to encourage them to avoid legal consequences that may result from negligence or unethical conduct in these tasks; to integrate the concepts of "occupational safety and health management system", "professional engineering" and "ethical standards" into their professional lives and to ensure that they contribute to the improvement of professional standards.**
Course objectives	The goal of this course is to acquire the ability to identify the occupational safety and health hazards in construction, to propose measures for prevention of accidents at workplace, to describe financial and legal consequences of workplace accidents, to explain enforcements of the Occupational Health and Safety Law, and to assess business situations within the framework of professional and ethical responsibilities of the engineer as well as ethical codes.
Student's obligation	**1- Attendance to lecture.** **2- preparation and discussion.** **3- Completion of four quiz at least.** **4- Completion of reports, homework, seminar and project.** **5- Completion of exams. For middy-term also final exam.**
Required Learning Materials	**1- Printing lectures.** **2- Presentation by using data show and smart board.** **3- Use of white board.** **4- Slides are shared with the students on electronic media (Moodle)**

Evaluation	**Task**		**Weight (Marks)**	**Due Week**	**Relevant Learning Outcome**
	Paper Review				
	Assignments	Homework	10	2-4-6	
		Class Activity	2	3-5-7	
		Report	8	3-4	
		Seminar	8	5-6	
		Essay			
		Project			
	Quiz		8	2-6-12	
	Lab.				
	Midterm Exam		24	10-11	
	Final Exam		40	15-16	
	Total		100		
Specific learning outcome:	1) Ability to interpret occupational accident statistics and awareness about the most common occupational accidents in construction. 2) Ability to identify responsibilities of engineers, employers, workers and other parties within the framework of occupational health and safety laws and regulations; ability to explain legal and financial consequences of work accidents. 3) Ability to determine components of the occupational health and safety management system and the documentation, training and inspection requirements. 4) Ability to identify hazards and make risk assessment in a specific construction site. 5) Ability to make assessment according to the professional and ethical responsibilities of an engineer against employer, the law, society and the colleagues; ability to relate the assessment to the relevant ethical codes.				
Course References:	1-Presentation lectures 2-Occupational Health and Safety Law and Regulations 3-Occupational Safety Standards and Handbooks **4-HEALTH, SAFETY AND ENVIRONMENT MANUAL BOOK FOR CONSTRUCTION PROJECTS, ERBIL – NOVEMBER 2020.** **5-Code of Ethics for Engineers PDF.** **6-NSPE Ethics Reference Guide**				

Course topics (Theory)	Week	Learning Outcome
1-INTRODUCTION , DUTIES AND RESPONSIBILITIES and RISK ASSESSMENT	1	Ability to identify responsibilities of engineers, employers, workers and other parties within the framework of occupational health and safety
2-EMERGENCY PLANNING	2	Ability to interpret occupational accident statistics and awareness about the most common occupational accidents in construction
3-CONTRACTOR MINIMUM REQUIREMENTS	3	Ability to explain legal and financial consequences of work accidents
4-Accommodation & Welfare	4	**When accommodation or welfare facilities are provided to Contractor's Personnel, the Contractor shall implement clear policies on the quality and management of such accommodation**
5-SAFETY TIPS IN ROAD CONSTRUCTION PROJECTS & VEHICLE TRAFFIC MANAGEMENT	5	Ability to identify hazards and make risk assessment in a specific construction site
6-ESSENTIAL SAFETY TOOLS FOR BRIDGE CONSTRUCTION WORKERS	6	Ability to make assessment according to the professional and ethical responsibilities of an engineer against employer
7-GENERAL HEALTH & SAFETY IN TUNNELING CONSTRUCTION	7	Ability to identify hazards and make risk assessment in a specific construction site, ability to define preventive measures for work accidents
8-SAFETY SIGNS & COLOR CODING	8	**Contractor must ensure that their staff and workers are aware of the different types of signage, their color coding and meanings**
9-Introduction What is ethics	9	Ability to access cases, contemporary knowledge and

		regulations on occupational safety and professional ethics, to compile information, to make an effective presentation.
10-Steps to Ethical Engineering Decisions	10	Ability to write effective reports and comprehend written reports, prepare design and production reports,
11-Ethics Cases	11	Ability to employ information technologies effectively.
12-NSPE Ethics Test	12	Knowledge about the interaction of designers and constructors.

Practical Topics	Week	Learning Outcome

Questions Example Design

Q1: What are the Major Safety Issues at Construction Site

Ans. The major areas considered for safety considerations at the construction site are:

1. Excavation work at Construction
2. House Keeping
3. Scaffolding Issues
4. Working at Heights

Q2: State the Safety Issues for Excavation and Trenching Works

Ans. Serious hazards can be provided to the workers involved in the trenching and excavation works. The major risk are during the cave-ins which is severe than any excavation issues. Before entering the trench, it must be assured that adequate protections are provided to prevent the cave-in hazards. Other issues associated with the same are hazardous atmosphere, falling loads and safety issues from the mobile equipment. **Safety Practices in Excavation and Trenching Works**

1. The sides of excavation work must be sloped and benched for easy movement. This avoids further collapse. A slope not steeper than 1and half to 1 is safe for any form of soil.
2. The sides of excavation must be supported.
3. The side of the excavation and the working area must be separated by means of a shield.
4. Protective barricades can be used to avoid falling of soil or rock over the workers. Any other equivalent form of protection can be provided.
5. When the mobile equipment or machines are working adjacent or near the edge of excavation, proper warning system have to be provided.
6. Keep the workers away during the loading and unloading of the heavy materials. This protects the life from falling materials or any spillage.

Q3: State the Safety Issues with Scaffolding Works

Ans. Improper scaffolding works will result in hazards. Fall hazards are occurred if the scaffolds are not properly erected or used. As per OSHA about 2.4 million construction workers work over scaffolding. Following the safety practices during scaffolding works helps to prevent injuries and fatalities. The figure- below shows scaffolding erected without any base. This will result in collapse of the scaffolding and danger to the worker working over it. Every scaffolding must be erected with strong foot bearing plates to avoid collapse.

Fig.: Scaffolding Provided Without Foot bearing Plates

Safety Practices in Scaffolding Works

1. The scaffolding must be erected on a solid footing with proper foot bearing plates
2. The scaffolding used must be strong and rigid
3. The scaffolding must carry its dead weight and almost 4 times the maximum load coming over it. This must be carried without any form of displacement or settlement.
4. Scaffolding must not be supported by means of boxes, loose bricks or any other unstable objects
5. Any repair or damage to the scaffolding accessories like braces, screw legs, ladders or trusses have to be repaired and replaced.
6. Access to the scaffolding is provided through ladders and stairwells
7. The natural and synthetic ropes used in suspension scaffolding must not interrupt with heat or electricity producing sources.
8. A minimum of 10 feet have to be maintained between the scaffolding and the electric lines.

Questions about Ethics and Professionalism

1. Consider Mary's preparation before visiting the site. Did Mary fulfill her professional obligation to her
employer? Give an argument for your answer with reference to the ASCE code of Ethics.

2. What about Mary's actions on the site the second day? Did she behave in a professional, ethical manner? Cite
the relevant ethical references in formulating your answer. If you think her actions should have been different,
describe what you would do in similar circumstances.

3. Should Mary's boss have let her inspect the construction job without supervision? Be sure to substantiate your
answer with reference to the ASCE Code of Ethics.

Answers to Ethical Questions:

Ans.q1:

1. Consider Mary's preparation before visiting the site. Did Mary fulfill her professional

obligation to her
employer? Give an argument for your answer with reference to the ASCE code of Ethics.
There are several items noted in the ASCE code of ethics that are relevant to this case:
1. "Engineers shall hold paramount the safety, health and welfare of the public in the performance of their professional duties."
2. "Engineers shall perform services only in areas of their competence."
3. "Engineers whose professional judgment is overruled under circumstances where the safety, health, and welfare of the public are endangered, shall inform their clients of the possible consequences."
4. "Engineers who have knowledge or reason to believe that another person or firm may be in violation of any of the provisions of Cannon 1 (to hold paramount the safety, health, and welfare of the public) shall present such information to the proper authority in writing and shall cooperate with the proper authority in furnishing such
further information or assistance as may be required."

Extra notes:

External Evaluator

The course book prepared by my colleague is properly arranged and covers the main requirements of the lesson. The lecturing procedures are identified properly. The assessment scheme and forms of teaching are arranged in a way that the student could understand clearly. It can be said that student will be satisfied with this course book and it promises a good outcome.

Assistant Professor
Nyazi R. Maroof
20/1 /2024