OSHE 112: Design of Hazard Controls
Fall Semester, 2017

Syllabus

Instructor: Lu Yuan, Sc.D., CSP
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Office Hrs: Monday and Wednesday, 3:30 pm to 5:00 pm. Other times by special appointment.

Course Description:
Prerequisites: Current enrollment or prior credit for OSHE 111. This course studies the application of scientific and engineering principles and methods to achieve optimum safety and health conditions through the analysis and design of process, equipment, products, facilities, operations, and environment. A variety of topics will be covered, including product design, plant layout, construction, maintenance, pressure vessels and piping, mechanical systems, materials handling and storage, ventilation, power tools, electrical equipment, confined space, and transportation vehicles and systems.

Course Objectives:
At the conclusion of this course, students are expected to:
1. Identify a variety of occupational hazards.

2. Recognize information resources regarding occupational hazards.

3. Explain basic principles and technologies to analyze and control occupational hazards.

4. Project objective: Select a specific work area from a list provided by the instructor, then analyze the work for potential hazards and develop controls to eliminate or mitigate the hazards.

Course Text:
Hagan, Philip E., Montgomery, John F., O'Reilly, James T. (2001) *Accident Prevention Manual for Business & Industry: Engineering & Technology, 12th Edition.* National Safety Council, Itasca, Illinois.

Exams:
There will be two mid-term exams plus a final exam given during the semester to measure your progress and to provide a basis for your grade. Each of the three exams will consist of multiple choice, matching, fill-in-the-blank and, where applicable, short math problems. There will be no essay questions. The two mid-term exams will cover the material studied during the period since the last exam. The final exam will be comprehensive, covering the entire course.

You will be permitted to make-up an exam ONLY if you have made arrangements PRIOR to

the time the exam was originally administered. No make-up exam will be allowed if you merely have not shown up for the original exam and have not made arrangements to take a make-up. The make-up exam must be taken BEFORE the next scheduled class period.
NO EXCEPTIONS will be allowed.

Quizzes, Exercises, and Assignments (QEAs):
To make the class more fun and interactive, six QEAs will be "randomly" given during the semester. They may appear at the beginning of the class, or at the end of the class, or be due by the specified class. Each QEA is worth 10 points. The highest five scores will be counted toward the grade total and the lowest one will be considered bonus points.

Project:
There will be a short research project which requires you to apply the principles learned in class to analyze a specific workplace hazard. The project will be presented in a paper of 5 to 10 pages. The paper will be graded upon accuracy of analysis of the problem and the appropriateness of the corrective measures that are recommended. Good grammar and correct spelling will also be considered in grading the paper.

Projects are due on **Tuesday, November 21st**. **Projects turned in after that date will receive only partial credit**.

Course Grades:
1. Grades will be assigned in accordance with the Departmental Scale:

Points	(Percent)		Grade
461-500	(93 - 100)	=	A, Superior
421-460	(85 - 92)	=	B, Very Good
381-420	(77 - 84)	=	C, Average
341-380	(69 - 76)	=	D, Below Average
0-340	(0 - 68)	=	F, Fail

2. Basis for assigning grades:

Two Mid-term Exams @ 100 points	=	200 points	(40% of grade)
Final Examination @ 150 points	=	150 points	(30% of grade)
Five QEAs @ 10 points	=	50 points	(10% of grade)
Research Project @ 100 points	=	100 points	(20% of grade)
TOTAL	=	500 points	

Course Requirements:
1. Adherence to departmental policies and procedures.
2. Regular class attendance as prescribed in the departmental requirements.
3. Read the material to be discussed in class prior to coming to class.
4. Complete and turn in QEAs and research project by due deadline.

NOTE:

1. Students will NOT automatically be dropped from class. Students who choose to drop must do so by the semester deadline! The last day to withdraw or resign from the university is Friday, 4 November, 2017.
2. If you are a qualified student with a disability seeking accommodations under the Americans with Disabilities Act, you are required to self-identify with the Office of Disability Services, War Memorial Student Union 1304.
3. Students' behavior/classroom decorum: "Free discussion, inquiry, and expression are encouraged in this classroom. Classroom behavior that interferes with either (a) the instructor's ability to conduct the class, or (b) the ability of the students to benefit from the instruction is not acceptable. Examples may include routinely entering class late or departing early; use of beepers, cellular telephones, or other electronic devices; repeatedly talking in class without being recognized; talking while others are speaking; or arguing in a way that is perceived as 'crossing the civility line.' In the event of a situation where a student legitimately needs to carry a beeper/cellular telephone to class, prior notice and approval by the instructor is required."
4. Academic Integrity. The academic community relies upon a high standard of integrity in the relations among its members. To the extent that this standard is not maintained, the good of the community suffers, and injustice (sometimes serious injustice) may be done. One of the most important aspects of academic integrity concerns the just measure of each student's academic accomplishments. These are ordinarily evaluated through written examination or submitted work. For such modes of assessment to operate fairly, it is essential that the instructor be assured that the work used to evaluate the student's performance is genuinely the student's own. It is also the responsibility of the student to uphold the academic integrity of the University. The use of unauthorized material, communication with fellow students during an examination, attempting to benefit from the work of another student and similar behavior that defeats the intent of an examination or other class work is unacceptable to the University. Cheating on examinations, plagiarism, improper acknowledgment of sources in essays and the use of a single essay or paper in more than one course without permission are considered very serious offenses and shall be grounds for disciplinary action.

Course Outline & Reading Assignments (Revised 08/14/17)

Class meets on Tuesdays and Thursdays from 11:00 am to 12:15 pm

Week	Date	Topic	Readings Due	Work Due
Unit 1: Facilities and Workstations				
1	Aug. 17	Introduction & Hazard Control in General	Chapter 1	
2	Aug. 22	Hazard Control in General (cont.)	Chapter 1	
	Aug. 24	Buildings and Plant Layout	Chapter 2	
3	Aug. 29	Buildings and Plant Layout (cont.)	Chapter 2	
	Aug. 31	Construction of Plant Facilities	Chapter 3	
4	Sep. 5	Construction of Plant Facilities (cont.)	Chapter 3	
	Sep. 7	Maintenance of Plant Facilities	Chapter 4	
5	Sep. 12	Maintenance of Plant Facilities (cont.)	Chapter 4	
	Sep. 14	Boilers and Unfired Pressure Vessels	Chapter 5	
6	Sep. 19	Boilers and Unfired Pressure Vessels (cont.)	Chapter 5	
	Sep. 21	FIRST EXAM	Review Unit 1	
Unit 2: Workplace Hazards and Controls				
7	Sep. 26 & 28	Machine Safeguarding & Lockout/Tagout	Chapter 6	
8	Oct. 3 & 5	Personal Protective Equipment	Chapter 7	
9A	Oct. 10	Electrical Safety	Chapter 10	
9B	Oct. 12	NO CLASS – Fall Break		
10A	Oct. 17	Electrical Safety (cont.)	Chapter 10	
10B	Oct. 19	Fire Hazards and Life Safety	Chapter 11	
11A	Oct. 24	Fire Hazards and Life Safety (cont.)	Chapter 11	
11B	Oct. 26	SECOND EXAM	Review Unit 2	
12A	Oct. 31	Research Project Update		
Unit 3: Materials Handling and Power Tools				
12B	Nov. 2	Materials Handling and Storage	Chapter 14	
13A	Nov. 7	Materials Handling and Storage (cont.)	Chapter 14	
13B	Nov. 9	Crane, Conveyor, and Rigging	Chap. 15 & 16	
14A	Nov. 14	Crane, Conveyor, and Rigging (cont.)	Chap. 15 & 16	
14B	Nov. 16	Powered Industrial Truck	Chap. 17 & 18	
15A	Nov. 21	Powered Industrial Truck (cont.)	Chap. 17 & 18	Project
15B	Nov. 23	NO CLASS – Thanksgiving Holiday		
16	Nov. 28 & 30	Hand and Portable Power Tools	Chapter 19	
17	Dec. 7	FINAL EXAM	Review Unit 3	

OTHER READING: Chapters 20 to 25 are to be considered potential topics of the research project, besides those presented during the class.