

## **Safety, Health, and Environment I (PTAC 1408)**



**Credit:** 4 semester credit hours (4 hours lecture)

**Prerequisite/Co-requisite:** None

### **Course Description**

Development of knowledge and skills to reinforce the attitudes and behaviors required for safe and environmentally sound work habits. Students will apply safety, health and environmental concepts on emergency response. There will be an emphasis on safety, health, and environmental issues in the performance of all job tasks and regulatory compliance issues.

### **Required Textbook and Materials**

1. *Safety, Health, and Environment*, Pearson Custom Publishing 2006
  - a. ISBN number is 0-536-25843-0

### **Course Objectives**

Upon completion of this course, the student will be able to:

1. List components of a typical plant safety and environmental program
2. Describe the role of a process technician in relation to safety, health.
3. Environment; and identify and describe safety, health, and environmental equipment uses.
4. Demonstrate appropriate response to emergency situations
5. Recognize hazardous situations for personnel, environment, and community.
6. Apply team skills in response to emergency situations.

### **Course Outline**

- A. Introduction
  1. Introduction of faculty and students
  2. Review Syllabus
  3. Review Class Policies
- B. Safety, Health, & Environment-  
Overview
  1. Different government agencies & regulations.
  2. Industry organizations that develop S.H.E. standards.
  3. Role of the operator in S.H.E. matters.
- C. Hazards and Their Effects
  1. Hazards found in work place.
  2. Effects of hazards on health.
  3. Effects of hazards on environment.
- D. Chemical Hazards
  1. Organic and inorganic chemical hazards.
  2. Introduction to MSDS

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E. Biological Hazards

1. Biological hazards in the workplace
2. Role of government relating to biological hazards.

F. Equipment and Energy Hazards

1. Hazards of process equipment.
2. Hazards caused by energy sources; i.e. electricity, steam, etc.

G. Fire and Explosive Hazards

1. The fire triangle
2. Government regulations relating to fire & explosives.

H. Pressure, Temperature and Radiation Hazards

1. "Process variable Hazards"
2. Government regulations dealing with process variable hazards.

I. Atmospheric and Respiration Hazards

1. Respiratory hazards.
2. "Confined space" hazard.
3. Government regulations dealing with atmospheric & respiratory hazards.

J. Work Area and Height Hazards

1. "Work area" hazard
2. Fall protection and confined space entry.
3. Government regulations dealing with "work area, fall and confined space hazards

K. Hearing and Noise Hazards

1. Noise & how it affects hearing.
2. Types of hearing protection
3. Government regulations regulating noise hazards

L. Construction, Maintenance, & Tool Hazards

1. Hazards associated with construction in the process area.
2. Hazards of tools used by process operators
3. Appropriate government regulations.

M. Vehicle and Transportation Hazards

1. Forklift, power truck, and other forms of transportation.
2. Appropriate government regulations.

N. Natural disasters

1. Hurricanes and storms
2. Emergency plans
3. Governmental agencies

O. Physical and Cyber-Security

1. Terrorists and insiders
2. Workplace violence
3. Government regulations

P. Ergonomic Hazards

1. Ergonomic stress
2. Lifting and working at heights
3. Government and industry guidelines

Q. Environmental hazards

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1. Hazardous chemical classifications
2. EPA regulations
- R. Hazard Controls
  1. Engineering, Administrative and PPE
  2. Why, When and How controls are applied
- S. Alarms and Indicator systems
  1. Fire alarms and detection systems
  2. Interlocks and shutdowns
- T. Process containment and Process Upset Controls
  1. Containment and control systems
  2. Flares and relief valves
- U. Administrative Controls
  1. Policies and procedures
  2. Training and HAZOPS
- V. Permitting Systems
  1. Lockout devices
  2. Types of permits: hot work, confined space, safe work, etc
  3. Government regulations and industry guidelines
- W. PPE and First Aid
  1. Respiratory and hearing
  2. Eye and face
  3. Foot and legwear
- X. Monitoring Equipment
- Y. Emergency Response
- Z. Presentations on S.H.E.
  1. Presentations of students
  2. Discussion of each presentation for content & application.

### **Grade Scale**

90 – 100 A  
80 – 89 B  
70 – 79 C  
60 – 69 D  
0 – 59 F

### **Course Evaluation**

Final grades will be calculated according to the following criteria:

Presentation 15%  
Tests 65%  
Final Exam 20%

### **Course Requirements**

1. Answer questions on chapter(s) assigned.
2. Identify safety equipment shown in class associated with subject matter.
3. Demonstrate proper procedures for handling safety hazards
4. Recognize hazardous situations

5. Use permitting systems and correct personal protective equipment
6. Use tools and procedures to respond to emergencies.
7. Prepare and present to class a seven (7) minute safety presentation.

### **Attendance Policy**

1. Missing more than 20% of classes will result in an automatic “F” for the course.
2. Absences are counted for unexcused, excused and coming to class late.
3. Missing more than 20% of a class period will count as an absence.
4. Being tardy 3 times equals 1 absence.

### **Course Policies**

1. No food, drinks, or use of tobacco products in class.
2. No foul or harsh language will be tolerated
3. Turn off all Cell Phones during lectures
4. Do not bring children to class.
5. No Cheating of any kind will be tolerated. Students caught cheating or helping someone to cheat can and will be removed from the class for the semester. Cheating can result from expulsion from LIT.
6. If you wish to drop a course, the student is responsible for initiating and completing the drop process. If you stop coming to class and fail to drop the course, you will earn an ‘F’ in the course.

### **Disabilities Statement**

The Americans with Disabilities Act of 1992 and Section 504 of the Rehabilitation Act of 1973 are federal anti-discrimination statutes that provide comprehensive civil rights for persons with disabilities. Among other things, these statutes require that all students with documented disabilities be guaranteed a learning environment that provides for reasonable accommodations for their disabilities. If you believe you have a disability requiring an accommodation, please contact the Special Populations Coordinator at (409) 880-1737 or visit the office in Student Services, Cecil Beeson Building.

### **Course Schedule**

<b>Week</b>	<b>Topic</b>	<b>Reference</b>
1	Course introduction & policies	
	Introduction to Safety, Health & Environment	Ch. 1
2	Types of Hazards & Their Effects	Ch. 2
3	Recognizing Chemical Hazards	Ch. 3
4	Recognizing Biological Hazards	Ch. 4
	TEST 1	

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5	Equipment & Energy Hazards	Ch. 5
	Fire & Explosion Hazards	Ch. 6
6	Pressure, Temperature, & Radiation Hazards	Ch. 7
	Hazardous Atmospheres & Respiration Hazards	Ch. 8
	TEST 2	
7	Working Area & Height Hazards	Ch. 9
	Hearing & Noise Hazards	Ch. 10
8	Construction, Maintenance & Tool Hazards	Ch. 11
	Vehicle & Transportation Hazards	Ch. 12
	TEST 3	
9	Natural Disasters & Inclement Weather	Ch. 13
	Physical Security & Cybersecurity	Ch. 14
10	Recognizing Ergonomic Hazards	Ch. 15
	Recognizing Environmental Hazards	Ch. 16
11	TEST 4	
	Introduction to Hazard Controls	Ch. 17
	Engineering Controls: Alarms & Indicators	Ch. 18
12	Engineering Controls: Containment & Upset	Ch. 19
	Administrative Controls	Ch. 20
13	TEST 5	
	Permitting Systems	Ch. 21
	PPE & First Aid	Ch. 22
14	Monitoring Equipment	Ch. 23
	Fire, Rescue & Emergency Response	Ch. 24
15	TEST 6	
	Student Presentations	
16	Student Presentations	

