

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

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

**Prerequisite/Co-requisite:** None



### **Course Description**

An overview of safety, health, and environmental issues in the performance of all job tasks in the process industry.

### **Required Textbook and Materials**

1. *Safety, Health, and Environment*, Second Edition
  - a. ISBN number is 13: 978-0-13-557249-8

### **Course Objectives**

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

1. Describe the components of a typical plant safety and environmental program and the role of a process technician in relation to safety, health, and the environment;
2. Identify the functionality of safety, health and environmental equipment used.

### **Course Outline**

- A. Introduction
  1. Introduction of faculty and students
  2. Review Syllabus
  3. Review Class Policies
- B. Safety, Health, & Environment-
  1. Overview
  2. Different government agencies & regulations.
  3. Industry organizations that develop S.H.E. standards.
  4. 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
- 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
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:

- HW/Presentation 10%
- Tests 50%
- Final Exam 40%

### **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.

## Course Schedule (Subject to Change)

Week	Topic	Reference
1	Course introductions and policies Intro to Safety, Health, and Environment <a href="#">Plickers Quiz 1 &amp; Syllabus Acknowledgement</a>	Ch 1
2	Types of Hazards and their Effects <a href="#">Plickers Quiz 2 &amp; Assignment #1</a> <b>Syllabus Test</b>	Ch 2
3	Recognizing Chemical Hazards <a href="#">Plickers Quiz 3</a>	Ch 3
4	Recognizing Biological Hazards <a href="#">Plickers Quiz 4</a> <b>TEST 1 (Chapters 1-4)</b>	Ch 4
5	Equipment and Energy Hazards Fire and Explosion Hazards <a href="#">Plickers Quiz's 5&amp;6</a>	Ch 5 Ch 6
6	Pressure, Temperature and Radiation Hazards Hazardous Atmospheres and Respiration Hazards <a href="#">Plickers Quiz's 7&amp;8</a> <b>TEST 2 (Chapters 5-8)</b>	Ch 7 Ch 8
7	Working Area and Height Hazards Hearing and Noise Hazards <a href="#">Plickers Quiz's 9&amp;10 &amp; Assignment #2</a>	Ch 9 Ch 10
8	Construction, Maintenance, and Tool Hazards Vehicle and Transportation Hazards Natural Disasters and Inclement Weather <a href="#">Plickers Quiz's 11, 12 &amp;13</a> <b>TEST 3 (Chapters 9-13)</b>	Ch 11 Ch 12 Ch 13
9	Physical Security and Cybersecurity <a href="#">Plickers Quiz 14</a>	Ch 14
10	Recognizing Ergonomic Hazards Recognizing Environmental Hazards <a href="#">Plickers Quiz's 15&amp;16</a>	Ch 15 Ch 16
11	Introduction to Hazard Control Engineering Controls: Alarms and Indicators <a href="#">Plickers Quiz's 17&amp;18</a> <b>TEST 4 (Chapters 14-18)</b>	Ch 17 Ch 18

12	Engineering Controls: Containment and Upset Administrative Controls <b>Plickers Quiz's 19&amp;20 &amp; Assignment #3</b>	Ch 19 Ch 20
13	Permitting Systems PPE and First Aid <b>Plickers Quiz's 21&amp;22</b>	Ch 21 Ch 22
14	Monitoring Equipment Fire, Rescue, and Emergency Response <b>Plickers Quiz's 23&amp;24</b>	Ch 23 Ch 24
15	<b>TEST 5 (Chapters 19-24)</b>	
16	<b>FINALS WEEK</b>	

### **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 2 times equals 1 absence.

### **Course Policies**

1. No food, drinks, or use of tobacco products in class.
2. Beepers, telephones, headphones, and other electronic devices must be turned off while in class.
3. Do not bring children to class.
4. Assignments submitted late will be reduced 10 points each day.
5. If a test is missed due to an emergency situation, the student will have one week to make it up; otherwise a grade of 0 will be assigned. Students are responsible for scheduling the make-up date.
6. 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 in expulsion from LIT.
7. A student who wishes to drop a course is responsible for initiating and completing the drop process. A student who stops coming to class, and fails to drop the course, 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 online resource: <http://www.lit.edu/depts/stuserv/special/defaults.aspx>

## **Student Code of Conduct Statement**

It is the responsibility of all registered Lamar Institute of Technology students to access, read, understand and abide by all published policies, regulations, and procedures listed in the *LIT Catalog and Student Handbook*. The *LIT Catalog and Student Handbook* may be accessed at [www.lit.edu](http://www.lit.edu) or obtained in print upon request at the Student Services Office.