Cerro Coso College
Course Outline of Record Report
12/06/2021

PTECC110X : Industrial Safety, Health, and Environment

General Information

Author:	- David Villicana - Dorrell, Mike - Lee, Travis
Course Code (CB01) :	PTECC110X
Course Title (CB02) :	Industrial Safety, Health, and Environment
Department:	Industrial Arts
Proposal Start:	Fall 2021
TOP Code (CB03) :	(0956.70) Industrial and Occupational Safety and Health
SAM Code (CB09) :	Clearly Occupational
Distance Education Approved:	No
Course Control Number (CB00) :	No value
Curriculum Committee Approval Date:	11/20/2020
Board of Trustees Approval Date:	03/11/2021
External Review Approval Date:	03/11/2021
Course Description:	This course develops the knowledge and skills to reinforce the attitudes and behaviors required for safe and environmentally sound work habits. Emphasis is placed on safety, health, and environmental issues in the performance of all job tasks and regulatory compliance issues. Students list components of a typical plant safety and environmental program, describe the role of a process technician in relation to safety, health, and environment, and identify and describe safety, health, and environmental equipment uses.
Submission Type:	New Course
	This is a new course attached to a new program.
Author:	No value

Faculty Minimum Qualifications

Master Discipline Preferred:	- Engineering - Engineering Technology - Industrial Safety - Industrial Technology (Foundry occupations) - Manufacturing Technology (Quality control, process control)
Alternate Master Discipline Preferred:	- Engineering - Engineering Technology - Industrial Safety - Industrial Technology (Foundry occupations) - Manufacturing Technology (Quality control, process control)
Bachelors or Associates Discipline Preferred:	- Engineering - Engineering Technology - Industrial Safety

- Industrial Technology (Foundry occupations)
- Manufacturing Technology (Quality control, process control)

Additional Bachelors or Associates Discipline Preferred:

- Engineering
- Engineering Technology
- Industrial Safety
- Industrial Technology (Foundry occupations)
- Manufacturing Technology (Quality control, process control)

Course Development Options

Basic Skills Status (CB08)

Course is not a basic skills course.

☐ Allow Students to Gain Credit by Exam/Challenge

Rationale For Credit By Exam/Challenge

No value

Course Support Course Status (CB26)

Course is not a support course

Course Special Class Status (CB13)

Course is not a special class.

Allowed Number of Retakes

0

Retake Policy Description

No value

Grade Options

- Letter Grade Methods

Course Prior To College Level (CB21)

Not applicable.

☑ Allow Students To Audit Course

Associated Programs

☑ Course is part of a program (CB24)

Associated Program	Award Type	Active
Industrial Process Technician	Certificate of Completion	Fall 2021

Transferability & Gen. Ed. Options

Course General Education Status (CB25)

Y

Transferability

Not transferable

Transferability Status

Not transferable

Units and Hours

Summary

Minimum Credit Units (CB07)	4
Maximum Credit Units (CB06)	4
Total Course In-Class (Contact) Hours	72
Total Course Out-of-Class Hours	144
Total Student Learning Hours	216
Faculty Load	0

Credit / Non-Credit Options

Course Credit Status (CB04)

Credit - Degree Applicable

Course Non Credit Category (CB22)

Credit Course.

Non-Credit Characteristic

No Value

Course Classification Status (CB11)

Credit Course.

☐ Variable Credit Course

Funding Agency Category (CB23)

Not Applicable.

☐ Cooperative Work Experience Education Status (CB10)

Weekly Student Hours

	In Class	Out of Classs
Lecture Hours	4	8
Laboratory Hours	0	0
Activity Hours	0	0

Course Student Hours

Course Duration (Weeks)	18
Hours per unit divisor	54
Course In-Class (Contact) Hours	
Lecture	72
Laboratory	0
Activity	0
Total	72
Course Out-of-Class Hours	
Lecture	144
Laboratory	0
Activity	0
Total	144

Time Commitment Notes for Students

Students will be required to participate in classroom discussions, complete in class assignments as well as homework assignments.

Faculty Load

Extra Duties: 0
Faculty Load: 0

Units and Hours - Weekly Specialty Hours

Activity Name	Type	In Class	Out of Class
No Value	No Value	No Value	No Value

Pre-requisites, Co-requisites, Anti-requisites and Advisories

No Value

Entrance Skills

Entrance Skills	Description
No value	No value

Limitations on Enrollment

Limitations on Enrollment	Description
No value	No value

Specifications

Methods of Instruction

Methods of Instruction	Discussion
Rationale	Students will be expected to participate in class discussions.

Methods of Instruction	Outside reading
Rationale	Students will be required to complete textbook readings outside of class.

Methods of Instruction	Instruction through examination or quizzing
Rationale	Students will be expected to complete various tests and quizzes.

Assignments

Explain what a confined space permit is and why it is needed.
Explain what an exhibit A is and which regulatory agency should be notified when out of compliance.

Methods of Evaluation	Rationale
Homework	Students will be given homework assignments such as the following: Identifying proper personal protective equipment (PPE); General plant safety rules; Types of fire extinguishers; Types of permits; Pressure and pressurized equipment; Water pollution control.
Final Exam	Students will be required to take a final exam testing the knowledge and comprehension of material taught throughout the course.
Tests	Students will be required to take tests on material learned throughout the semester.

Equipment

No Value

Textbooks

Author	Title	Publisher	Date	ISBN
Charles E. Thomas	Process Technology Safety, Health, and Environment	Cengage Learning	2012	978-1-1110-3635-5

Other Instructional Materials

No Value

Materials Fee

No value

Learning Outcomes and Objectives

Course Objectives

No value

CSLOs

Apply important industry concepts and principles to draw conclusions about the roles and responsibilities of a process technician in an environmental setting.

Expected SLO Performance: 70.0

Identify and analyze regulatory agencies within the industries including their roles and how they affect the environment.

Expected SLO Performance: 70.0

Identify and understand process system equipment hazards and their characteristics within the industry.

Expected SLO Performance: 70.0

Outline

Course Outline

1. Introduction to Process Safety
    1.1 Key Terms
    1.2 Process Safety
    1.3 Personal Protective Equipment
    1.4 The Process Technician and the Chemical Processing Industry
    1.5 Attitudes and Behaviors
    1.6 General Plant Safety Rules
    1.7 Job Hazard Anaylsis
    1.8 Types of Fire Extinguishers
    1.9 Types of Permits

2. Hazard Classification
    2.1 Key Terms
    2.2 Common Industrial Hazards
    2.3 Physical, Chemical, Ergonomic, and Biological Hazards
    2.4 Electrical Hazards
    2.5 Industrial Noise Hazards
    2.6 Radiation Hazards
    2.7 Hazard Recognition
    2.8 Accident Prevention
    2.9 Accident Investigation

3. Route of Entry and Envirnomental Effects
    3.1 Key Terms
    3.2 Routes of Entry
    3.3 Environmental Effects
    3.4 Air Pollution
    3.5 Air Pollution Control
    3.6 Agencies
    3.7 Air Permitting
    3.8 Water Pollution Control
    3.9 National Water Quality Standards
    3.10 Water Permitting

4. Gases, Vapors, Particulates, and Toxic Metals
    4.1 Key Terms
    4.2 Physical Hazards Associated with Gases, Vapors, Particulate, and Toxic Metals.
    4.3 Health Hazards Associated with Gases, Vapors, Particulate, and Toxic Metals.
    4.4 Asbestos
    4.5 Particulates
    4.6 Dust and Gases
    4.7 Dust Explosions
    4.8 Flammable Gases
    4.9 Compressed Gas Cylinders
    4.10 Metallic Substances

4.11 Metallic Compounds
4.12 Metals That are Fire Hazards

5. Hazards of Liquids
5.1 Key Terms
5.2 Hazards of Liquids
5.3 Physical Hazards Associated with Liquids
5.4 Health Hazards Associated with Liquids
5.5 Pressure and Pressurized Equipment
5.6 Process Systems
5.7 Flammable Liquid Storage
5.8 Spontaneous Combustion
5.9 Oxidizers
5.10 Hazards of Steam
5.11 Hazards of Water
5.12 Acids and Caustics
5.13 Solvents
5.14 Paints and Adhesives
5.15 Hepatoxic Agents and Other Harmful Agents

6. Hazardous Chemical Identification
6.1 Key Terms
6.2 Introduction to Hazardous Chemical Identification
6.3 The Hazards Communication Program, The Workers Right to Know
6.4 Material Safety Data Sheet (MSDS)
6.5 Toxicology
6.6 Safety Signs, Tags, and Warning Labels
6.7 Department of Transportation Labeling System
6.8 Hazardous Materials Identification System (HMIS
6.9 National Fire Protection Association (NFPA)

7. Fire and Explosion
7.1 Key Terms
7.2 Fire, Explosion, and Detonation
7.3 Chemical Explosions
7.4 Polymers and Fire
7.5 Flammable, Explosive, and Radioactive Hazards
7.6 Flammable and Explosive Materials
7.7 Fundamentals of Fire Prevention, Protection, and Control
7.8 The Chemistry of Fire
7.9 Fire Stages
7.10 Flashpoint, Flammable Limits, and Ignition Temperature
7.11 Fire Classification System
7.12 Fire Extinguisher Use
7.13 Fighting Fires

8. Electrical, Noise, Heat, Radiation, Ergonimic, and Biological Hazards
8.1 Key Terms
8.2 Plant Specific Hazards
8.3 Electricity
8.4 Bonding and Grounding
8.5 Heat and Radiation
8.6 Hearing Conservation and Industrial Noise
8.7 Ergonomic Hazards
8.8 Hazards of Confined Spaces
8.9 Hazards of Lifting
8.10 Biological Hazards
8.11 Blood-Borne Pathogens

9. Safety Permit Systems
9.1 Key Terms
9.2 Types of Permits
9.3 Confined Space Entry
9.4 Control of Hazardous Entry (Lockout/Tagout)

9.5 Opening or Blinding Permits

9.6 Routine Maintenace Permits

10. Personal Protective Equipment (PPE)

10.1 Key Terms

10.2 Personal Protective Equipment

10.3 Hazards in the Workplace

10.4 Emergency Response, Four Levels of PPE

10.5 Written Respiratory Protection Programs

11. Engineering Controls

11.1 Key Terms

11.2 Risk Evaluation

11.3 Design and Operation of Plants For Safety

11.4 Alarms and Indicators

11.5 Fire Alarms and Detection Systems

11.6 Toxic Gas Alarms and Detection Systems

11.7 Interlocks and Automatic Shutdown Devices

11.8 Process Containment and Upset Controls

11.9 Closed Systems/Closed-Loop Sampling

11.10 Ventilation Systems

11.11 Effluent Control and Waste Treatment

11.12 Noise Abatement

11.13 Flares

11.14 Pressure Relief Devices

11.15 Explosion Suppression Systems

12. Administrative Controls

12.1 Key Terms

12.2 Introduction to Administrative Controls

12.3 Community Awareness and Emergency Response

12.4 Job Safety Anaylsis

12.5 Hazards and Operatability Study

12.6 Mandated Training

12.7 Housekeeping

12.8 Safety Inspections and Audits

12.9 Monitoring Equipment

12.10 First Aid

13. Regulatory Overview

13.1 Key Terms

13.2 Occupational Safety and Health Act

13.3 Process Safety Management

13.4 Environmental Protecion Agency

14. Process System Hazards

14.1 Key Terms

14.2 Operating Hazards

14.3 Equipment and System Related Hazards

14.4 Steam Generation

14.5 Flare System

14.6 Weather-related Hazards

14.7 Chemicals and Chemical-related Hazards

14.8 Reactors

14.9 Distillation Factors

14.10 Human Factors

Delivery Methods

Delivery Method: Please list all that apply -Face to face -Online (purely online no face-to-face contact) -Online with some required face-to-face meetings ("Hybrid") -Online course with on ground testing -iTV – Interactive video = Face to face course with significant required activities in a distance modality -Other

- Face to face

Rigor Statement: Assignments and evaluations should be of the same rigor as those used in the on-ground course. If they are not the same as those noted in the COR on the Methods of Evaluation and out-of-class assignments pages, indicate what the differences are and why they are being used. For instance, if labs, field trips, or site visits are required in the face to face section of this course, how will these requirements be met with the same rigor in the Distance Education section? Describe the ways in which instructor-student contact and student-student contact will be facilitated in the distance ed environments.

No Value

Good practice requires both asynchronous and synchronous contact for effective contact. List the methods expected of all instructors teaching the course. -Learning Management System -Discussion Forums -Message -Other Contact -Chat/Instant Messaging -E-mail -Face-to-face meeting(s) -Newsgroup/Discussion Board -Proctored Exam -Telephone -iTV - Interactive Video -Other

No Value

Software and Equipment: What additional software or hardware, if any, is required for this course purely because of its delivery mode? How is technical support to be provided?

No Value

Accessibility: Section 508 of the Rehabilitation Act requires access to the Federal government's electronic and information technology. The law covers all types of electronic and information technology in the Federal sector and is not limited to assistive technologies used by people with disabilities. It applies to all Federal agencies when they develop, procure, maintain, or use such technology. Federal agencies must ensure that this technology is accessible to employees and the public to the extent it does not pose an "undue burden". I am using -iTV—Interactive Video only -Learning management system -Publisher course with learning management system interface.

No Value

Class Size: Good practice is that section size should be no greater in distance ed modes than in regular face-to-face versions of the course. Will the recommended section size be lower than in on-ground sections? If so, explain why.

No Value

Emergency Distance Education Options The course will operate in remote delivery mode when all or part of the college service area is under an officially declared city, county, state, or federal state of emergency, including (check all that apply) - Online including all labs/activity hours - Hybrid with online lecture and onsite lab/activity hours - Correspondence education in high school and prison facilities - None. This course will be cancelled or paused if it cannot be held fully onsite.

- Online including all labs/activity hours