The University of Jordan
School of Engineering
Chemical Engineering Department

Program: B.Sc.
Academic Year: ( )
Semester: Semester

- **CHE 0915581: Process Safety Engineering**

- **Course Catalog (2024)**

Introduction to safety and loss prevention. Hazards of Chemical and toxic materials: indices, grouping, and ratings. Fires and explosions, ignition and ignition sources. Explicability characteristics for gas and dust, explosivity limits, explosion pressures, ignition temperature, and ignition energy. Methods of protection and prevention, such as bursting discs, relief valves, suppression, and inerting. Design of safety valves, HAZOP and risk analyses for process systems. Safety codes and checklist consideration in design and operation. Maintenance and permit to work proforma. Layers of protection analysis and incident investigations. Several case studies.

Credit hours	**2**	**Level**		**Pre-requisite(s)**	**0915571**
Instructor **Dr. Motasem Saidan**		**Office number** **CHE303**		**Office phone** Ext. 22893	
Course website https://elearning.ju.edu.jo/login/index.php		**E-mail** **m.saidan@ju.edu.jo**		**Place** Refer to Registration website	

- **Textbook:**
  1. Daniel A. Crowl and Joseph F. Louvar, *Chemical Process Safety: Fundamentals with Applications*, 2nd Edition., Prentice Hall, 2001
  2. Instructor Handouts.

- **References:**
  1. R. Sanders, Chemical Process Safety, 3rd Edition. Elsevier Inc., 2005
  2. http://www.csb.gov/

- **Learning Objectives and Intended Learning Outcomes**

Objectives	**Outcomes**
1. Basic introduction to process safety and loss prevention significance and process safety management	1.1 Demonstrate appreciation of the importance of safety on-the-job **O4**
2. Understanding of process safety engineering and loss prevention through the history and evolution of chemical process safety	2.1 Demonstrate ability to participate actively as a member of a Process Hazard Analysis team **O1, O3, O5**
3. Apply process associated hazards identification, evaluation & analysis, and control procedures.	3.1 Demonstrate ability to identify and evaluate hazards associated with a process facility **O1, O2**
3. Basic and Fundamental understanding of process hazard and operability (HAZOP) assessment	3.1 Demonstrate ability to understand the risks associated with a process, and the consequences of deviation from normal operation **O1**
4. Enhance the ability of students for life-long learning and communication skills	4.1 Enhance students' skills through intensive use of available data resources and short projects with written and oral presentations **O3, O4**

Topics Covered

Week	Topics	Reference
1- 2	Course Introduction and Overview: ▪ Understanding risk ▪ Perception of risk and acceptable risks ▪ Layers of protection ▪ Management systems ▪ "Designed for safety" concept ▪ Nature of chemical process accidents and case histories	Handouts, Textbook, Chap. 1
3	Toxicology	Handouts, Textbook, Chap. 2
4-5	Industrial hygiene	Handouts, Textbook, Chap. 3
5- 6	Source Models	Handouts, Textbook, Chap. 4
7-10	Fires & Explosions	Handouts, Chap. 6
11-12	Designs for Fires & Explosions Prevention	Handouts, Textbook, Chap. 7
13-14	Introduction to Reliefs: concepts, types, and systems	Handouts, Textbook, Chap. 8 & 9
15-16	Case Histories & Accident Investigations	Handouts, Textbook, Chap. 12, 13, Ref. 1 & 2.

Evaluation

Evaluation Tool	Weight	Date
Midterm Exam	30	Will be announced by the department
Project	15	Will be arranged between the 5th and 16th weeks
Presentations	5	To be arranged one week after the assignment
Homework	5	Will be submitted one week after the assignment
Final Exam	50	Will be announced by the University

Intended Scale

F	D-	D	D+	C-	C	C+	B-	B	B+	A-	A

Relationship to Program Outcomes (%)

O1	O2	O3	O4	O5						

Relationship to CHE Program Objectives

PEO1	PEO2	PEO3	PEO4
√	√	√	√

Document Control

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