



ChE 578: Chemical Process Safety

2 credit hour, 2 contact hour lecture, 2 credit hour Eng.

Instructor

Instructor: Rowaida Zoumot

E-mail: zmot@just.edu.jo

Textbooks & References

A. Textbook

	Textbook 1
Title	Chemical Process Safety: Fundamentals with Applications
Author(s)	Daniel A. Crowl, Joseph F. Louvar
Publisher	Pearson Education, Inc
Year	2015
Edition	Fourth

B. References

1. Daniel A. Crowl, Joseph F. Louvar, “*Chemical Process Safety: Fundamentals with Applications*” third edition, Pearson Education, Inc, 2011
2. “www.osha.gov”, Occupational Safety and Health Administration
3. “www.csb.gov”, Chemical Safety Board
4. “www.epa.gov”, Environmental Protection Agency

Specific Course Information

Course Catalog: This course focuses on process safety in the design of chemical and petrochemical plants (batch and continuous). The lectures discuss how to select appropriate designs that prevent or mitigate the release of flammable or toxic materials that could lead to a fire, explosion, health, and environmental damage. The course encapsulates the important technical fundamentals or chemical process safety. Specialist in industrial safety engineering will be invited to illustrate the application of safety fundamentals in chemical and petrochemical industries.

A. Prerequisites or co-requisites

ChE 575

B. Required/Elective or Selected Elective

Required

Objectives and Outcomes*

1. Be able to discuss the nature of accident process and methods used in accident investigation, inherently safer design strategies, and the various strategies and governmental regulations relevant to process safety management [1, 2, 4, 5, 6, 7]
2. Be able to discuss toxicology, industrial hygiene, source models, dispersion models, flammability, reactivity, fires and fire prevention, explosion and explosion prevention, electrostatics, pressure relief systems, runaway reactions, and risk analysis as they apply to chemical process safety, and be able to solve corresponding problems [1, 2, 4, 5, 6, 7]
3. Be able to collect and analyze data for determining flash points, flammability limits, runaway reaction potential, designing pressures relief systems, and for characterizing dust explosions and electrostatic charge accumulation and discharge [1, 2, 4, 5, 6]
4. Have opportunities to future professional development through working on group assignment, studying professional ethics, practicing written, oral, and graphical communication skills [1, 2, 3, 4, 5, 7]

Contribution of Course to Meeting the Professional Component

Relationship to Student Outcomes (%)

1	2	3	4	5	6	7
19	19	8	15	15	12	12

Relationship to Chemical Engineering Program Objectives

PEO1	PEO2	PEO3	PEO4	PEO5	PEO6
Y	Y	Y	Y	Y	Y

Topics Covered

1. Introduction to Process Safety
2. Toxicology
3. Industrial Hygiene
4. Source Models
5. Toxic Release and Dispersion Models
6. Fire and Explosions
7. Design to Prevent Fires and Explosions
8. Risk Assessment
9. Case Study Presentations

Evaluation

Assessment Tool	Expected Due Date	Weight
Course activity + Presentation	Scheduled during the course	20%
MID Exam	According to the department schedule	40 %
Final Exam	According to the university schedule	40 %

* Number in brackets refer to the Program outcomes