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Department of Chemical Engineering	
Safety Engineering (64381)	
Total Credits	**3**
major compulsory	
Prerequisites	P1 : Thermodynamics I (64335) OR Thermodynamics for Chem. Eng.I (64331)

Course Contents

This course teaches students the basic principles of engineering safety including the proper ways of handling chemical, hazardous and poison materials in the lab or an industrial plant. Basics of inflammation, fires, and explosions, ways of protection from fires and explosions as well as relevant legislation concerning occupational safety will be covered in this course. At the end of the course, students will learn how to investigate accidents in an attempt to avoid such accidents in future.

Intended Learning Outcomes (ILO's)		Student Outcomes (SO's)	Contribution
1	Apply knowledge from mathematics and science to solve safety problems.	A	30 %
2	Design a safe system to minimize the likelihood of an accident.	C	25 %
3	Identify hazardous conditions and recommend an engineering solution.	E	30 %
4	Communicate effectively in both writing and deliver oral presentation.	G	15 %

Textbook and/ or Refrences

Crowl, D. A. &Louvar J. F. (2002). Chemical Process Safety Fundamentals with Applications. (2nd Edition). Prentice Hall. ISBN 0-13-018176-5 (main text book)

Assessment Criteria	Percent (%)
First Exam	20 %
Second Exam	20 %
Homeworks	5 %
Projects	15 %
Final Exam	40 %

Course Plan

Week	Topic
1	Introduction to Chemical Process Safety
1_2	Introduction: Safety Programs, engineering ethics, accident and loss statistics, acceptable risk, the nature of accident process, inherent safety, case study of a significant disaster
3_4	Toxicology: How toxicant enters biological organism, how toxicants are eliminated from biological organism, dose versus response, models for dose and response curves, Threshold limit values.
5	First Midterm Exam
5_6	Industrial Hygiene: Government regulation, industrial hygiene: identification, evaluation, and control techniques.
7_8	Fires and Explosion: The fire triangle, distinction between fires and explosion, flammability characteristics, Limiting Oxygen Concentration, explosion.
9_11	Design to prevent fire and explosion: Inerting, static electricity, controlling static electricity, explosionproof equipment and instruments.

12	Second Midterm Exam
12_14	Hazards Identification: process hazards checklist, hazards surveys, Hazards and operability study, safety reviews.
15	A project: related to hazards identification and human factors
16	Final Exam