

1. **Course number and name - CHBE 4515 – Chemical Process Safety (required)**
2. **Credits and contact hours - 1 credit hours, 1 lecture hour (1-0-0-1)**
3. **Instructor’s or course coordinator’s name – Dr. Chris Jones**
4. **Textbook, title, author, and year**
D. Crowl and J. Louvar, “Chemical Process Safety: Fundamentals with Applications”, 3rd Ed., Prentice-Hall, 2011.
5. **Specific course information**
 - a. **Catalog Description** – Fundamental sources of chemical hazards and degree of risk. Process design and hazard avoidance are used to reduce risk.
 - b. **Prerequisites or co-requisites** – CHBE 3210 Transport Phenomena II (grade “C” or better); CHBE 3225 Separations Processes (grade “C” or better); CHBE 4300 Kinetics and Reactor Design (grade “C” or better)..
 - c. **Required, elective, or selected elective course** (as per Table 5-1) – Required
6. **Specific goals for the course**
 - a. **Specific outcomes of instruction:**
By the end of this course, a student should be able to:
 - 1) Develop an awareness of safety culture
 - 2) Evaluate effect of toxicants and other hazards
 - 3) Quantitatively analyze release and dispersion rates of liquids and vapors
 - 4) Analyze fire and explosion hazards
 - 5) Integrate safety concepts into chemical process design
 - b. **Connection with Student Outcomes**

CHBE 4515							
	Student Outcomes						
Course Outcomes	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Course Outcome 1				X			
Course Outcome 2		X		X			
Course Outcome 3	X			X		X	
Course Outcome 4	X	X		X		X	
Course Outcome 5	X	X		X			

Student Outcomes

- (1) an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
- (2) an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
- (3) an ability to communicate effectively with a range of audiences
- (4) an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
- (5) an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
- (6) an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
- (7) an ability to acquire and apply new knowledge as needed, using appropriate learning strategies

7. Brief list of topics to be covered

- a. Accident process/loss statistics, inherent safety, safety culture, ethics
- b. Toxicology
- c. Industrial hygiene
- d. Source models
- e. Toxin release and dispersion
- f. Fires and explosions
- g. Relief and safety devices
- h. Hazard identification and risk analysis
- i. Case studies