

## PROCESS SAFETY MANAGEMENT

SFT 489/589

FALL 2002

**TEXTBOOK:** Chemical Process Safety, Daniel A. Crowl and Joseph F. Louvar, 2002 Edition,  
Publishers : Prentice Hall, Inc. Englewood Cliffs, New Jersey 07632

**COMPUTER REQUIREMENTS:** The ability to navigate the Internet is needed.

**INSTRUCTOR:** Dr. John A. Singley.

212C Communications Building

Office hours posted in the department, see department Secretary

Telephone 696-3067

E-mail. Singley@marshall.edu

**CREDITS:** Three

**PREREQUISITES:** SFT 465/565 and a good background in science and mathematics will be very useful.

**LEARNING OUTCOME:** The course is designed to teach and apply the fundamentals of chemical process safety. The major thrust of the course is to acquaint the student with the techniques for controlling industrial hazards, primarily those in the chemical industry. The techniques learned here and the information covered are applicable to other industrial situations, not just the chemical industry. The recognition, evaluation and control of hazards is fundamental to the safety profession and all students need this ability.

**EVALUATION AND MEASUREMENT OF STUDENT PROGRESS:** The student will be responsible for both lecture and textbook material. There may be some unannounced quizzes during the course covering either lecture material, textbook material or both. The lecture material will not necessarily follow the reading assignments, as outlined in the course outline. Problems have been assigned and the student is expected to complete these assignments by the following scheduled class at which time they are due. There will be no mid-term or final examination. Hour quizzes will substitute for these items. Graduate students will be assigned additional problem sets for the semester. In addition, graduate students will complete a term paper about some subject dealing with process safety. The term paper will be at least 15 pages in length and have at least 15 references, excluding the text.. The first draft of the term paper is due the 7<sup>th</sup> week of class. The final draft of the paper is due the 11<sup>th</sup> week of class. The term paper shall follow the Chicago Manual of Style. This style can easily be found on the Internet.

**GRADING POLICY:** Hour Quizzes ( 20 % each) - 80%; Graduate Students (15% each) - 60%  
Problems - 15%  
Attendance - 5%  
Graduate Student Term Paper - 20%

## Page 2

**POLICY STATEMENT:** There will be four hour quizzes, no mid-term or final examination.

Absences from quizzes will be honored if accompanied with a physician's excuse.

If some business requirements or family emergency does not allow you to be present for a quiz, you will be allowed to take a make-up quiz, subject to the approval of the instructor. However, the make-up quiz will be different from the scheduled quiz.

Further, the make-

up quiz must be made up within one week of the scheduled quiz or a failing grade will be given. No other excuses for missing a quiz will be considered. Problems not turned in on the date expected will receive lower grades. The use of tobacco in any form is prohibited in the classroom. In addition, students shall not wear any hats in class, unless there is a religious or medical need.

**ATTENDANCE POLICY:** Attendance at each session is expected and attendance will be taken.

### **COURSE OUTLINE:**

- Wk 1 The History of Process Safety. Pp 1-19, Problems 1-1,1-2,1-3,1-4; Graduate Student Problems 1 - 5, 1 - 6, 1 - 7, Chemical Engineering students 1-16, 1-23, 1-28.
- Wk 2 Toxicology. Pp 22-44, Problems 2-5; Graduate Student Problems 2 -1, 2 - 3; Chem. Eng. 2-26, 2-27.
- Wk 3 Industrial Hygiene. Pp 47-78, Problems 3-1,3-2,3-4; Graduate Student Problems 3 - 3, 3 - 12; Chem Eng. 3 -25, 3-28.
- Wk 4 Hour Quiz
- Wk 5 Source Models. Pp 82-117, Problem 4-1; Graduate Student Problems 4 - 2; Chem Eng. 4-21, 4 -24.
- Wk 6 Toxic Release and Dispersion Models. Pp121-151, Problem 5-1; Graduate Student Problems 5 - 2, 5 - 15; Chem Eng. 5 -19, 5 - 27.
- Wk 7 Fires and Explosions. Pp158-192, Problems 6-1,6-2; Graduate Student Problems 6 - 4, 6 - 5; Chem Eng. 6 -22, 6 - 24.
- Wk 8 Hour Quiz 2
- Wk 9 Design to Prevent Fires and Explosions. Pp 194-236, Problems 7-1,7-2; Graduate Student Problems 7 - 4, 7 - 26; Chem Eng. 7 - 22, 7 - 27.
- Wk 10 Introduction to Relief. Pp 240-280, Problems 8-1,8-2; Graduate Student Problems 8 -3, 8 - 9, 8 - 10, 8 - 12; Chem. Eng. 8 - 15, 8 -16.
- Wk 11 Hazard Identification. Pp 308-332, Problem 10-1; Graduate Student Problems 10 - 4, 10 - 5, 10 - 9; Chem. Eng. 10 - 22, 10 -23
- Wk 12 Hour Quiz 3
- Wk 13 Risk Assessment, Pp 338-362, Problem 11-2; Graduate Student Problems 11 - 7; Chem. Eng. 11 - 8, 11 - 22.
- Wk 14 Accident Investigation. Pp 366-382, Problem 12-1; Graduate Student Problems 12 - 2, 12 - 3, 12 - 5; Chem. Eng. 12 - 28, 12 - 29.

Wk 15. Case Histories. Pp 384-401, Problem 13-4; Graduate Student Problems 13 - 1, 13 - 2, 13 - 5; Chem. Eng. 13 – 28, 13 - 29.

**Page 3**

Wk 16 Hour Quiz 4

**NOTE:** Under grads do first set of problems. Grads do all problems except those listed as Chem Eng students. Chem Eng. Students do all problems.

**BIBLIOGRAPHY:**

Guidelines for Hazard Evaluation Procedures, 2nd Edition, 1992, Center for Chemical Process Safety, American Insstitute for Chemical Engineers, 345 East 47th Street, NY NY 10017

HAZOP AND HAZAN, 1992, Trevor Kletz, Institute of Chemical Engineers, Rugby, Warwickshire, CV213HQ, United Kingdom

Plant Design for Safety, 1991, Trevor Kletz, Hemisphere Publishing Corporation, NY NY

Guidelines for Technical Management of Chemical Process Safety, 1981, Center for Chemical Process Safety, American Institute for Chemical Engineers, 345 East 47th Street, NY NY 10017

Plant Guidelines for Technical Management of Chemical Process Safety, 1992, Patrica Van Talge, Editor, American Institute for Chemical Engineers, 345 East 47th Street, NY NY 10017