CHEMICAL AND PROCESS SAFETY

**ChBE 4515**

**FALL 2012**

**Lecture:** Monday 10:05-10:55 AM

EST Room L1205

**Text:** D. Crowl and J. Louvar, “Chemical Process Safety:

Fundamentals with Applications” Third Ed.,

Prentice-Hall, 2011 (REQUIRED)

**Instructor:** Dennis W. Hess

Room 2204 EST

X4-5922

dennis.hess@chbe.gatech.edu

**Office Hours:** Tuesday 2:00 - 3:00 PM

Wednesday 2:00 - 3:00 PM

(or by appointment)

**Quizzes:** There will be a number of quizzes during the semester.

No quizzes on 8/27, 9/10, 9/17, or 12/3

These will be closed textbook and closed notes.

**Course Grade:** Homework (due at start of class) 15%

Quizzes 40%

Attendance and Class Participation 10%

Final Exam 35%

**Teaching Assistant:** Tae-Seop Choi

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Office Hours: Monday, Thursday 1-2 PM

-2-

**ChBE 4515 – Chemical & Process Safety Fall 2012**

**NOTES:**

1. Unexcused absence on the day of a quiz will result in a zero on the quiz; a written memo must be submitted (with details and supporting documentation) **in advance** if you are to be excused from a quiz
2. Homework must be handed in no later than 10:20 AM on the day that it is due to obtain full credit. HW handed in between 10:20 AM and 10:55 AM will receive 50% of the earned points; after 10:55 AM, no HW will be accepted. NO EXCEPTIONS WILL BE MADE.
3. Attendance will be taken by 10:20 AM during each class period; after that time, no attendance sheet sign-up will be allowed and you will be marked absent.
4. Homework must be completed neatly; if the graders cannot easily understand the solution due to poor presentation (sloppy, unorganized and unclear writing), 50% of the points will be deducted even if the answer is correct.
5. Each year several seniors do not graduate when planned because they received a D or F in this class. I will be unsympathetic to excuses at the end of the semester if you do not do well because you missed classes and quizzes, or did not turn in homework when due. My intent is for everyone (1) to learn this material (the content is extraordinarily important for your future career and the well-being of you and your co-workers) and (2) to do well in this class; I hope that everyone will earn an A.

**Course Objectives:** Develop and awareness of safety culture

Evaluate effect of toxicants and other hazards

Quantitatively analyze release and dispersion of liquids

and vapors

Analyze fire and explosion hazards

Integrate safety concepts into chemical process design

Recognize the role that ethics plays in process design

and operation

Perform hazard identification and risk assessment

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**ChBE 4515 – Chemical & Process Safety Fall 2012**

**Please note that we support the guidelines on academic integrity offered by the Georgia Tech Honor Advisory Council; two of the guidelines are shown below.**

*Plagiarizing is defined by Webster’s as “to steal and pass off (the ideas or words of another) as one's own : use (another's production) without crediting the source.”  
If caught plagiarizing, you will be dealt with according to the GT Academic Honor Code.*

Cheating off of another person’s test or quiz is unethical and unacceptable. Cheating off of anyone else’s work is a direct violation of the GT Academic Honor Code, and will be dealt with accordingly.

For any questions involving these or any other Academic Honor Code issues, please consult me, my teaching assistant, or www.honor.gatech.edu.

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**Date Chapter(s) Topics Homework DUE**

8/20 1 Introduction, Ethics

Safety Culture

8/27 2 Toxicology

9/3 LABOR DAY HOLIDAY

9/10 3 Industrial Hygiene OPINION PAPER ASSIGNMENT

9/17 Case Study: Seveso C&L: 1-3, 1-4, 1-5, 2-3, 2-5

9/24 4 Source Models C&L: 3-3, 3-21, 3-22, 3-28; LOOK UP

MSDS FOR benzene, diethylamine, and phosgene, AND STATE HAZARDOUS

PROPERTIES FOR EACH OF THESE

10/1 5 Toxic Release/Dispersion Models

10/8 6 Fires and Explosions C&L: 4-2, 4-3

10/15 FALL BREAK

10/22 7,8 Chemical Reactivity

Case Study: UC Berkeley

10/29 Case Study: Bhopal C&L: 5-1, 5-4, 5-7, 5-9

11/5 Case Study: Piper Alpha

11/12 9, 10, 11, 12 Relief and Safety Devices

Hazards Identification

11/19 Case Study: Flixborough C&L: 6-1, 6-3, 8-3, 10-3

11/26 Electrical Hazards

12/3 Ionizing Radiation; Course Summary