CHEG 4103 –P23 Special Topics –Loss Prevention in Process Industries

PRAIRIE VIEW A & M UNIVERSITY

COLLEGE OF ENGINEERING

Roy G. Perry College of Engineering

Department of Chemical Engineering

COURSE SYLLABUS

Course Title: SPECIAL TOPICS: Chemical Process Design & Evaluation
Course Prefix: CHEG Course No.: 4103 Section No.: P13
Department of Chemical Engineering College of Engineering
Instructor Name: ***Dr. Emmanuel A. Dada***
Office Location: ***WILS 201B***
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U.S. Postal Service Address: Prairie View A&M University
P.O. Box 519
Mail Stop 2505
Prairie View, TX 77446-0519
Office Hours: TR 2:00 – 3:00 P.M.; R 2:00 – 3:00 P.M. & 5:00 – 6:00 p.m.

Virtual Office : By Phone (215-850-1883) and Skype by appointment (appointment must be scheduled via e-mail to emmanuel.dada@ymail.com) ; skype name: emmanuel.dada1

Course Location: S. R. Collins Bldg 224

Class Meeting Days &Times: TR 12:30 AM - 1:50 PM

Course

Description: (3-0) Credit 3 semester hours. The course will stress the systems approach to chemical process design and will include multiple such as facets including design of a chemical process and its evaluation based on performance, cost and risk. Studies will involve the use of computer-aided design, cost estimation, environmental impact evaluation, and scenario based studies.

Course Goals: This course prepares CHEG students with the following outcomes.

- Able to create a process (synthesis) and represent it thorough a process flow diagram (PFD).
- Able to simulate a process using ASPEN and/or HYSYS, starting with a process description and/or PFD.
- Able to analyze a process and optimize it based on considerations of performance, cost, and risk.
- Able to create design alternative scenarios, establishing a baseline scenario and alternative scenarios for evaluation and comparison.

Prerequisite: Senior standing in the Chemical Engineering major.
Co-requisites: No applicable.

Textbook: Turton, Baille, Whiting, and Shaejwitz, Analysis, Synthesis, and Design of Chemical Processes, 2nd edition, Required[1]

Prentice Hall, 2003, ISBN: 0-13-064792-6.

References: Harry Silla, Chemical Process Engineering – Design and Economics E Review Manual, Marcel Dekker, Inc. (New York, 2003), ISBN: 0-847-4274-5.

Aspen Technologies, Inc., Aspen Plus User's Guide, available at http://web.ist.utl.pt/ist11038/acad/Aspen/AspUserGuide10.pdf or from instructor, and HYSYS User's guide also available from instructor or

http://www.ualberta.ca/CMENG/che312/F06ChE416/HysysDocs/AspenHYSYSUserGuide.pdf .

Access to Learning Resources:

PVAMU Library:
phone: (936) 261-1500;
web: http://www.tamu.edu/pvamu/library/
University Bookstore:
phone: (936) 261-1990;
web: https://www.bkstr.com/Home/10001-10734-1?demoKey=d

Course Goals or Overview:

The goal of this course is to introduce senior chemical engineering students to principles of chemical process safety and quantitative methods for risk analysis and loss prevention.

Course Outcomes/Objectives

[1] See textbook policy elsewhere in this syllabus. 3rd Edition (2009) is also acceptable.

Course Objectives Assessed

The course is designed to incorporate continuous assessment of students using homework, quizzes, projects and exams to evaluate competence in ABET 2000 criteria *a*, *e* and *k* as outlined below:

c.1 Ability to design a system, component, or process to meet desired needs (criterion *c*)

h.1 The broad education necessary to understand the impact of engineering solutions in a global and societal context (criterion *h*)

j.1 A knowledge of contemporary issues (criterion *j*)

Course Requirements & Evaluation Methods

This course will utilize the following instruments to determine student grades and proficiency of the learning outcomes for the course. The course has been designed to ensure that students acquire a solid grounding in ABET 2000 outcomes a: Ability to apply the knowledge of mathematics, science, and engineering and e: Ability to identify, formulate, and solve engineering problems.

Computer Assignments – self-explanatory assignments, including web based training. Videos, and DVDs

Homework Exercises – written assignments, often in letter report format, designed to supplement and reinforce course material. The letter report format serves to develop and demonstrate an ability to communicate effectively in written mode.

Quizzes – announced or surprise in-class assignments to promote student accountability

Partial Tests – the objective is determining concept development and problem-solving skills. .

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Final Examination and/or Project Reports &Presentations at the discretion of the instructor Grading Matrix *(points will vary at the discretion of the instructor.)*

Instrument Total

Homework, Computer Assignments & Quizzes 30%

Partial Exams (Mid-term, etc) and/or Projects Reports&Presentation at the discretion of the instructor 40%

Final Exam and/or Project Reports & Presentation at the discretion of the instructor 30%

Penalty for lack of participation -10%

Total 100%

**Extra credit may be assigned by instructor as optional but available to all.

Grade Determination:

A = 90 – 100pts;
B = 80 – 89pts;
C = 70 – 79pts;
D = 60 – 69pts;
F = 59pts or below

Program Outcomes

Measured by Course Program ABET outcomes (f) and (j) assessed using course assignments.

Data Used to Show

Student Proficiency in Measured Program Outcomes

1. Samples of student work in a Binder

2. Spreadsheet showing student performance and class average

3. End of Semester Course Assessment report

Course Procedures

Textbook Policy

Students must acquire the textbook if listed as "required" on the course syllabus. The textbook must be acquired by the 10th class day. Students are not allowed to share textbooks with other students who are currently registered in the same class. Failure to acquire (or show proof of purchase) the required textbook by the 10th class day will result in the student being administratively dropped from the course. The University will assess financial obligations for the course to the student as with any other dropped class according to the fee schedule. In addition, your financial aid may be affected by the subsequent registration action(s).

Go to http://www.pvamu.edu/pages/195.asp for the Roy G. Perry College of Engineering Textbook Policy.

Conduct:

1. Students will conduct themselves in a manner that is respectful to their fellow classmates and the instructor at all times.

2. **Cell phones, ipads and smart phones or similar electronic devices MUST** be turned off and stowed away during class time. Students are **NOT** allowed to leave class to answer cell phones or use these devices except for an emergency with the permission of the instructor. .
3. Students caught using ipads and smart phones or similar electronic devices during exams will receive **ZERO** for the exam and be subject to sanctions as stipulated under **Academic Misconduct**.
4. Students should be prepared to stay in the classroom for the duration of the exam. Students who have any condition that may require them to leave the exam room should make prior arrangements with the Instructor. Students who decide to leave the exam room for any other reason must handover their exam paper and consider the exam over for them.
5. Programmable calculators are **NOT** allowed in class.
6. Students should dress professionally and are **NOT** allowed to wear caps/hats in class.
7. Students are NOT allowed to bring food to the classroom or eat in class
8. Arrive to class prepared to discuss lesson with your project binder.
9. eBooks and/or Internet access are not allowed during class exams.

Submission of Assignments:

 All assignments are due by default one week after being given, unless otherwise stated.

All homework assignments are due directly to the Instructor, prior to the start of class or the assignment will not be accepted. All homework assignments and exams should be written on one side of the page only, and should use the appropriate cover sheet, with the name, assignment title and date. All pages should be numbered. Failure to use the correct format will result in the assignment grade being reduced by 20%.

Exam Policy
Exams should be taken as scheduled. No makeup examinations will be allowed except under documented emergencies (See Student Handbook).
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LECTURE OUTLINE & SAMPLE TOPICS (subject to changes by the instructor.)

Detailed Syllabus and Course Organization*

Week	Lecture Topic with reference	Assignments
Week 1: MLK Holiday	Review of syllabus; course overview (table of contents); introduction. Pre-requisite skills inventory. Overview of Sections 1 and 2.	Outline Ch. 1-8 of Turton and Baille
Week 2:	Review of highlights from Chapters 1-7 (continued)	HW 1
Week 3:	Using Experienced-Based Principles in Design (Ch. 9) The role of heuristics and short-cut methods.	Read Chapter 9
Week 4:	Process Synthesis: (Ch. 10) PFD from BFD	Read Chapter 10 HW 2
Week 5: E-Week	Process Synthesis: (Ch. 11) Computer Simulation - Intro to ASPEN & HYSYS	Read Chapter 11 Exam 1 (Ch 9-10)
Week 6:	Process Synthesis: (Ch. 11 & 20) Computer Simulation - Performance analysis	Computer Tutorials HW 3
Week 7:	Process Synthesis: (Ch. 11 & 20) continued Computer Simulation - Performance analysis	Computer Tutorials Project 1
Week 8: Midterms	Process Synthesis: (Ch. 12) Computer Simulation – Use of Scenarios and Case Studies	Read Chapter 12 Mid-Term Exam HW 4
Week 9: Spring Break		

Week 10:	Process Synthesis: (Ch. 12) continued Computer Simulation – Use of Scenarios and Case Studies	Read Chapter 12 HW 5
Week 11:	Impact of ChE Designs on Society: (Ch. 21) Ethics and Professionalism	Read Chapter 21 HW 5
Week 12:	Impact of ChE Designs on Society: (Ch. 22) Health, Safety & Environment	Read Chapter 22 HW 6 due
Week 13:	Impact of ChE Designs on Society: (Ch. 23) Green Engineering – Assessing Impacts with SCENE	Computer Tutorials Read Chapter 23
Week 14:	Systems Analysis Projects Evaluating performance, cost and risk	HW 7 due Project 2
Week 15:	Making Technical Decisions The role of modeling and analysis	
Week 16:	Last day of class (course review) Study days (no class).	**Check University Schedule for Final Exam Date**

*Note: Instructor reserves the right to modify/change the course syllabus as needed. Students will be provided with a revised syllabus if changes or modifications are made.

University Rules and Procedures

Disability statement (See Student Handbook):

Students with disabilities, including learning disabilities, who wish to request accommodations in class should register with the Services for Students with Disabilities (SSD) early in the semester so that appropriate arrangements may be made. In accordance with federal laws, a student requesting special accommodations must provide documentation of their disability to the SSD coordinator.

Academic misconduct (See Student Handbook):

You are expected to practice academic honesty in every aspect of this course and all other courses. Make sure you are familiar with your Student Handbook, especially the section on academic misconduct. Students who engage in academic misconduct are subject to university disciplinary procedures.

Forms of academic dishonesty:

1. Cheating: deception in which a student misrepresents that he/she has mastered information on an academic exercise that he/she has not mastered; giving or receiving aid unauthorized by the instructor on assignments or examinations.
2. Academic misconduct: tampering with grades or taking part in obtaining or distributing any part of a scheduled test.
3. Fabrication: use of invented information or falsified research.
4. Plagiarism: unacknowledged quotation and/or paraphrase of someone else's words, ideas, or data as one's own in work submitted for credit. Failure to identify information or essays from the Internet and submitting them as one's own work also constitutes plagiarism.

Nonacademic misconduct (See Student Handbook)

The university respects the rights of instructors to teach and students to learn. Maintenance of these rights requires campus conditions that do not impede their exercise. Campus behavior that interferes with either (1) the instructor's ability to conduct the class, (2) the inability of other students to profit from the instructional program, or (3) campus behavior that interferes with the rights of others will not be tolerated. An individual engaging in such disruptive behavior may be subject to disciplinary action. Such incidents will be adjudicated by the Dean of Students under nonacademic procedures.

Sexual misconduct (See Student Handbook):

Sexual harassment of students and employers at Prairie View A&M University is unacceptable and will not be tolerated. Any member of the university community violating this policy will be subject to disciplinary action.

Attendance Policy:

Prairie View A&M University requires regular class attendance. Excessive absences will result in lowered grades.

Excessive absenteeism, whether excused or unexcused, may result in a student's course grade being reduced or in assignment of a grade of "F". Absences are accumulated beginning with the first day of class.

Student Academic Appeals Process

Authority and responsibility for assigning grades to students rests with the faculty. However, in those instances where students believe that miscommunication, errors, or unfairness of any kind may have adversely affected the instructor's assessment of their academic performance, the student has a right to appeal by the procedure listed in the Undergraduate Catalog and by doing so within thirty days of receiving the grade or experiencing any other problematic academic event that prompted the complaint.

Changes:

Course evaluation, grading scales and outline can be changed by the instructor. Such changes shall be communicated to the students.