

**University of Connecticut**  
**CHEG 2103: Introduction to Chemical Engineering**  
**Fall 2010**

**Course Description:**

Application of the principles of chemistry, physics, and biology to chemical processes; units, dimensions, and process variables; material balances; equations of state; single component equilibria, energy balances for non reactive and reactive processes; combined mass and energy balances.

**Instructors:**

Prof. Brian Willis, Engr. II 208, [bgwillis@engr.uconn.edu](mailto:bgwillis@engr.uconn.edu)

Prof. Leslie Shor, Engr. II 209, [leslie.shor@uconn.edu](mailto:leslie.shor@uconn.edu)

Office hours: For Lecture or Homework: Monday 4:30-5:00 EII 208 or EII 209 and  
Wednesday 4:00-5:00 PM in EII 324.  
For Project: Wednesday 5:00-6:00 EII 209

Teaching Assistant: Liwei Huang, UTEB 260, [lih09005@engr.uconn.edu](mailto:lih09005@engr.uconn.edu),

Office hours: Tuesday 3:30-5:30 PM in EII 324

Teaching Assistant: Jinzi Deng, Bronwell 206, [jinzi.deng@uconn.edu](mailto:jinzi.deng@uconn.edu)

Office hours: Monday 6:30-8:30 PM in EII 324

**Lectures:** MWF 1:00-1:50 pm Physics Bldg. Room 38

**Textbook:** Elementary Principles of Chemical Engineering by Felder & Rousseau

**Pre-Requisites:** Chem 1128, Math 1132, Basic Matlab

**Policies:**

Student Conduct: [http://www.dosa.uconn.edu/student\\_code.html](http://www.dosa.uconn.edu/student_code.html)

Students are responsible for adherence to the University of Connecticut student code of conduct.

Attendance: Attendance will be taken each class. Attendance does not count towards the grade, but may be used to judge a student's diligence.

Absences: Make-up of missed exams requires permission from the Dean of Students, see "Academic Regulations." Midterm-exams are treated the same as Final Examinations.

Special Circumstances: Students involved in official University activities that conflict with class time must inform the instructor in writing prior to the anticipated absence and take the initiative to make up missed work in a timely fashion.

Religious observances:

"Students anticipating such a conflict should inform their instructor in writing within the first three weeks of the semester, and prior to the anticipated absence, and should take the initiative to work out with the instructor a schedule for making up missed work." **Students will be required to take exams before the class exam period.**

## Grading:

Mid-term Exams: There will be two mid-term exams for **25% each** and a final exam for **25%** of the total grade. **Requests to re-grade an exam** will include a total re-grade of the exam. Scores could increase or decrease based on the re-grade.

Final Exam: Final exam week for Fall 2010 takes place from Monday, December 13<sup>th</sup> through Saturday, December 18<sup>th</sup>. Students are required to be available for their exam during the state time. If you have a conflict with the scheduled time, you must visit the Office of Student Services and Advocacy to discuss the possibility of rescheduling the exam.

Please note that vacations, previously purchased tickets or reservations, graduations, social events, misreading the exam schedule, and over-sleeping are not viable excuses for missing a final exam.

Quizzes: Announced quizzes will be given throughout the semester. They will count for **15%** of the total grade. (All quizzes are closed-book, closed-notes, and closed to everything else). The lowest Quiz score will be dropped.

Homework: Homework will be assigned approximately every week and due the following week on **Wednesday at the beginning of class**. Homework will count for **10%** of the total grade. The lowest score will be dropped. **One late day** will be allowed during the semester. Solutions will be posted approximately 24 hours after the due date and no credit will be given for any homework received after 5 pm the day after the homework was due. **All other homework are due at the beginning of class on the due date.** Homework received after the start of class may use the one allowed late day. All others will not be counted.

**Homework is essential to learning the CHEG 2103 material. In order to pass the class, regardless of exam and quiz grades, at least 65% of the homework must be completed. The 65% will be calculated based on the total number of homework points.**

Honors: The honors project will count as an **additional 25%** and all other grade components will be re-scaled as indicated above. Non-honors students may also participate in the honors project.

### Grading: Standard

|                 |            |
|-----------------|------------|
| Midterm 1       | 25%        |
| Midterm 2       | 25%        |
| Final Exam      | 25%        |
| Quizzes         | 15%        |
| <u>Homework</u> | <u>10%</u> |
| TOTAL           | 100%       |

### Grading: Honors Project

|                       |            |
|-----------------------|------------|
| Midterm 1             | 20%        |
| Midterm 2             | 20%        |
| Final Exam            | 20%        |
| Quizzes               | 12%        |
| Homework              | 8%         |
| <u>Honors Project</u> | <u>20%</u> |
| TOTAL                 | 100%       |

## **Course Outcomes:**

Upon completion of this course, students will:

1. Learn to apply mathematics, chemistry, physical, and biological principles to solve complex multi-step problems.
2. Gain greater mastery of problem solving approaches and strategies.
3. Learn to solve material balance problems with multi-component systems and multiple input and output streams.
4. Learn to solve energy balance problems including calculation of thermodynamic parameters.
5. Gain a greater appreciation for modern engineering challenges and broader societal impacts.

### CHEG 2103 Tentative Lecture Schedule

| Date (2010)  | Topic                                    | Chapter | Event               |
|--------------|--|---------|---------------------|
| 8/30         | Introduction, Conservation Laws          | 1       | 1 <sup>st</sup> Day |
| 9/1          | Introduction, Conservation Laws          | 2 & 3   |                     |
| 9/3          | Material Balances                        | 4       |                     |
| 9/6          | No Class                                 |         | Labor Day           |
| 9/8          | Material Balances                        | 4       | Hmwk #1 due         |
| 9/10         | Component Material Balances              | 4       |                     |
| 9/13         | Component Material Balances              | 4       |                     |
| 9/15         | Constitutive Relations                   | 4       | Hmwk #2 due         |
| 9/17         | Constitutive Relations                   | 4       |                     |
| 9/20         | Material Balances with Mass Transfer     | 4       |                     |
| 9/22         | Multi-unit/ recycle balances             | 4       | Hmwk #3 due         |
| 9/24         | Multi-unit/ recycle balances             | 4       |                     |
| 9/27         | Chemical Reaction and Conversion         | 4       |                     |
| 9/29         | Stoichiometric Tables                    | 4       | Hmwk #4 due         |
| 10/1         | Balances on Reactive Processes           | 4       |                     |
| 10/4         | Balances on Reactive Processes           | 4       |                     |
| 10/6         | Single Phase Systems                     | 5       | Hmwk #5 due         |
| 10/8         | Single Phase Systems                     | 5       |                     |
| <b>10/11</b> | <b>Midterm Exam I</b>                    |         |                     |
| 10/13        | Single Phase Systems                     | 5       | Hmwk #6 due         |
| 10/15        | Single Phase Systems                     | 5       |                     |
| 10/18        | Multiphase Systems                       | 6       |                     |
| 10/20        | Multiphase Systems                       | 6       | Hmwk #7 due         |
| 10/22        | Multiphase Systems                       | 6       |                     |
| 10/25        | Multiphase Systems                       | 6       |                     |
| 10/27        | Biosystems                               |         | Hmwk #8 due         |
| 10/29        | Biosystems                               |         |                     |
| 11/1         | Biosystems                               |         |                     |
| 11/3         | Energy Balances - Conservation Laws      | 7       | Hmwk #9 due         |
| 11/5         | Energy Balances - Conservation Laws      | 7       |                     |
| 11/8         | Energy Balances - Closed systems         | 7       |                     |
| <b>11/10</b> | <b>Midterm Exam II</b>                   |         | Hmwk #10 due        |
| 11/12        | Energy Balances – Closed Systems         | 7       |                     |
| 11/15        | Energy Balances – Non Reactive Processes | 8       |                     |
| 11/17        | Energy Balances – Non Reactive Processes | 8       | Hmwk #11 due        |
| 11/19        | Energy Balances – Non Reactive Processes | 8       |                     |
| 11/22        | No class                                 |         | Break               |
| 11/24        | No class                                 |         | Break               |
| 11/26        | No class                                 |         | Break               |
| 11/29        | Energy Balances – Transient              | 11      |                     |
| 12/1         | Energy Balances – Transient              | 11      | Hmwk #12 due        |
| 12/3         | Energy Balances – Reactive Systems       | 9       |                     |
| 12/6         | Energy Balances – Reactive Systems       | 9       |                     |
| 12/8         | Energy Balances – Reactive Systems       | 9       | Hmwk #13 due        |
| 12/10        | Energy Balances – Reactive Systems       | 9       | Last Class          |