CHEN4130 Course Syllabus

Chemical Engineering Laboratory 2

Class Meetings: Mon, Tues & Fri 1-6pm in BIOT 171 (students attend 1 session only)

Instructors: Wendy Young (M/T) Email: wendy.young@colorado.edu
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Lab Coordinator: Ann Greco Email: ann.greco@colorado.edu

Instructional Videos: http://www.colorado.edu/chbe/academics/course-descriptions/undergraduate-level-courses/chemical-engineering-lab

Text: Writing Style and Standards in Undergraduate Reports, 3rd Edition

Other Materials: Lab notebook (ONE PER GROUP); safety glasses

Course Learning Objectives
- To work in a simulated industrial environment, with emphases on teamwork, open-ended problem solving, project-style report writing, and effective oral communications.
- To provide hands-on operating experience with typical chemical engineering equipment and to obtain experience with heat transfer, fluid flow, separations, thermodynamics and reacting systems.
- To provide experience with planning and implementing experiments.
- To review and practice chemical engineering principles.
- To provide an understanding of, and practice with, the use of statistics and data interpretation with real experimental data.

General Format of Class
Ten experiments will be examined in this course:
1. Continuously Stirred Tank Reactor
2. Distillation Column
3. Draining Tank
4. Gas Adsorption
5. Heat Exchanger
6. Hilsch Vortex Tube
7. Pressure Drop
8. Reverse Osmosis
9. Steam Jacketed Tank
10. Tubular Flow Reactor

Each student group will do six experiments during the semester according to the Course Schedule. Please see the Course Schedule for all work deadlines.
Assignments and Grading Basis

See Assignments document for list of points per assignment.

Most, if not all, assignments will be turned in through D2L.

Turn in your assignments on time!!
- Assignments are due at the time/date shown on the Course Schedule.
- Assignments turned in late will be counted for 50% of possible points for 24 hours after the due date/time.
- **No credit** will be given for assignments turned in over 24 hours past the due date.
- There is no penalty for turning in an assignment early!

Attendance
- **ALL GROUP MEMBERS MUST ATTEND ALL CLASSES.**
- **Each** unexcused absence will result in a 10% deduction of the **final** grade.
- Even if you do not need to conduct experiments on the 2\textsuperscript{nd} experimental day, you must check in with the instructor at the beginning of class.
- If you must miss a class, work with the instructor ahead of time to see if a make-up is possible.

Lab Make-Ups
- If **ALL group members** have attended BOTH experimental sessions for a particular experiment and the group still does not have sufficient data, please work with the instructor to schedule lab time outside normal class hours.
- If **all group members** have NOT attended both experimental sessions, please do not ask to make up a lab outside of the normal class period.

Lab Safety
In conducting the Chemical Engineering Laboratory 2 courses, we require the following practices of students, teaching assistants, and faculty.

Note: NO CELL PHONE USE IS ALLOWED IN LAB.

1. Eye Protection

You must wear eye protection in the lab area. Eye protection must meet ANSI standards. Minimum protection consists of spectacles with side shield.

If you wear glasses, you may obtain safety spectacles with side shields to wear over your glasses. You may also obtain prescription safety glasses with side shields. The lenses in prescription safety glasses are thicker than standard glasses.

If you are observed in the lab without eye protection, you risk being disenrolled from the course.

2. Dress and Appearance (from *Safety in Academic Chemistry Laboratories, ACS, 1992*)
High-heeled or open-toed shoes, sandals, or shoes made of woven material should not be worn in the lab. Shorts, cut-offs, or short skirts are not permitted. Long hair and loose clothing should be constrained. Jewelry such as rings, bracelets, and watches should not be worn, to prevent chemical seepage under the jewelry, contact with electrical sources, catching on equipment, and damage to the jewelry itself.

3. Chemical Safety

Material Safety Data Sheets (MSDS) must be obtained for all experiments using chemicals. Each group member must read and understand the safety precautions and disposal procedures.

Waste chemicals are to be disposed of in appropriate containers located in the Satellite Accumulation Areas (SAA’s). They are never to be poured down drains! Chemicals must be stored in approved and labeled containers. Solid materials contaminated by waste chemicals are disposed of in appropriate containers and must not be placed in the standard wastebaskets.

Waste materials, especially “sharps” such as needles and broken glass, must be placed in special containers for these materials. Do not place these items in the standard wastebaskets.

4. Behavior in the Laboratory

Don’t
- Run
- Yell, except in an emergency
- Eat, drink, or smoke
- Engage in horseplay or mischief
- Ride anything (bikes, skateboards, inline skates)

Do
- Keep an eye out for hazards
- Think before you act
- Ask, if you have any doubt
- Take your time
- Be careful
- Inform and stay informed

5. Safety Devices

Know where all the fire extinguishers in the vicinity of the lab are and know their type. Know the location of the safety showers and eye washes and how to operate them. Know the escape routes from the lab and where you would call 911 after leaving the lab area.

Submit with First Lab Notebook: Prepare a map of the lab with all fire extinguishers, safety showers and eye wash stations, and show 2 alternate escape routes, using different colors and symbols.

Ethical Standards
This course follows the University Honor Code.
All students enrolled in a University of Colorado Boulder course are responsible for knowing and adhering to the academic integrity policy of the institution. Violations of the policy may include: plagiarism, cheating, fabrication, lying, bribery, threat, unauthorized access, clicker fraud, resubmission, and aiding academic dishonesty. All incidents of academic misconduct will be reported to the Honor Code Council (honor@colorado.edu; 303-735-2273). Students who are found responsible for violating the academic integrity policy will be subject to nonacademic sanctions from the Honor Code Council as well as academic sanctions from the faculty member. Additional information regarding the academic integrity policy can be found at honorcode.colorado.edu.

The following actions will not be tolerated and will be grounds for academic penalty as deemed appropriate by the instructor and in compliance with University Honor Code.

1. Papers submitted by any student, written in part or in whole by someone other than that student; in addition, submitted papers that have already been submitted for a different class.
2. Vandalism, destruction of property, stealing.
3. Violation of CU guidelines and standards.

These actions shall be considered to constitute fraud under the University Honor Code or unacceptable or criminal behavior. The penalties can include, but are not limited to, a reduction in assigned grade, receiving an F on the assignment or for the course, or personal responsibility to correct the violation.

Disability
If you qualify for accommodations because of a disability, please submit to your professor a letter from Disability Services in a timely manner (for exam accommodations provide your letter at least one week prior to the exam) so that your needs can be addressed. Disability Services determines accommodations based on documented disabilities. Contact Disability Services at 303-492-8671 or by e-mail at dsinfo@colorado.edu. If you have a temporary medical condition or injury, see Temporary Injuries guidelines under the Quick Links at the Disability Services website and discuss your needs with your professor.

Religious Observances
Campus policy regarding religious observances requires that faculty make every effort to deal reasonably and fairly with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. In this class, (insert your procedures here). See the campus policy regarding religious observances for full details.

Classroom Behavior Policy
Students and faculty each have responsibility for maintaining an appropriate learning environment. Those who fail to adhere to such behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, color, culture, religion, creed, politics, veteran’s status, sexual orientation, gender, gender identity and gender expression, age, disability, and nationalities. Class rosters are provided to the instructor with the student’s legal name. I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the semester so that I may make appropriate changes to my records. For more information, see the policies on classroom behavior and the student code.
Sexual Misconduct, Discrimination, Harassment and/or Related Retaliation

The University of Colorado Boulder (CU Boulder) is committed to maintaining a positive learning, working, and living environment. CU Boulder will not tolerate acts of sexual misconduct, discrimination, harassment or related retaliation against or by any employee or student. CU’s Sexual Misconduct Policy prohibits sexual assault, sexual exploitation, sexual harassment, intimate partner abuse (dating or domestic violence), stalking or related retaliation. CU Boulder’s Discrimination and Harassment Policy prohibits discrimination, harassment or related retaliation based on race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation or political philosophy. Individuals who believe they have been subject to misconduct under either policy should contact the Office of Institutional Equity and Compliance (OIEC) at 303-492-2127. Information about the OIEC, the above referenced policies, and the campus resources available to assist individuals regarding sexual misconduct, discrimination, harassment or related retaliation can be found at the OIEC website.