Department: CHEG

Course No.: 239W

Title: Chemical Engineering Laboratory

Credits: 3

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WQ: W

Catalog Copy: 239W. Chemical Engineering Laboratory. Second semester. Three credits. Two 1-hour discussion periods. Two 3-hour laboratories. Prerequisite: ENGL 105 or 110 or 111 or 250. Recommended preparation: CHEG 237W, 251, and 247. Open-ended laboratory investigations in chemical engineering focusing on reaction kinetics, reactor design, process control, and mass transfer; emphaisis on student teamwork and on design of experiments to meet objectives; technical report writing; oral presentations.

W Criteria: a) In CHEG 239W, students perform a series of open-ended experiments involving pilot scale heat exchangers, distillation columns, reactors, etc. Students define the scope of each experiment, plan and run the experiments, analyze the results, and report their findings. Documents describing the course, each experiment, Preparation of Lab Reports, Statistical Analysis, etc. can be accessed on the class web site (www.engr.uconn.edu/~suzy). Cheg 239W course objectives state that successful students will:

1. Integrate knowledge and skills acquired in earlier courses;
2. Solve open-ended problems by applying theory, planning and executing an experimental program, and analyzing and interpreting results;
3. Work effectively in teams;
4. Demonstrate laboratory safety and knowledge of equipment operation;
5. Communicate their results clearly and effectively.

b) Successful completion of the course requires that students perform 5 experiments; complete a pre-lab conference with the TA before each experiment, present two oral reports; and submit the following:
2 major group written reports (where each student writes sections of the first two reports)
1 minor individual written report (each student writes a complete short report ~5 pages)
1 major individual written report (each student writes a complete long report ~15 pages).

The grading for the course is weighted as follows: 2 Major group written reports =12% ea, 1 Minor individual written report =12%, 1 Major individual written report =24%, 7-minute oral report =10%, 15-minute oral report =20%, and Team & Laboratory performance =10%.

Students are instructed to write each report as if they are ‘selling' their finding and ideas to the reader. Students must combine previously learned theory, analytical and writing skills with a knowledge of equipment operation and data acquisition to produce a well organized, precise,

clear, concise, and forthright report. There are no specific “page requirements” for each report but the University “15 page” requirement is amply met via the 4-report requirement set in the course. The University “revision requirement” is met by requiring that four consecutive written reports be submitted, each on a different laboratory experiment. Each report receives written commentary and is handed back well in advance of the due date of the next report. This course structure allows us to repeat writing concepts while covering multiple technical topics. Students may voluntarily rewrite reports to improve writing and organization skills as well as grades. Roughly 60% of the course grade is based on the written reports, 30% is based on oral communication and 10% is based on laboratory performance. Students are informed in the syllabus that all written reports must be turned in and that they must pass the writing component of the course to pass the class. This is emphasized by the instructors and reinforced by the relative weighting of course grade.

Writing instruction is provided by faculty members via one three-hour lecture, a detailed handout on preparation of laboratory reports (see web page mentioned above), written commentary on each lab report and through personal contact during the labs. These instructors make themselves available to the students during regularly scheduled lab periods and extensive office hours. Two faculty members per section are assigned to teach the lab. Grading of all written reports is done entirely by the faculty instructors. An emeritus faculty member, the lab technician and 1-2 TA's also work closely with the students in this class. There are typically 20-25 students per lab section. The course TA is only responsible for pre-lab conferences and guidance in laboratory safety and equipment operation. The laboratory technician also provides guidance in laboratory safety and equipment operation and the emeritus faculty quizzes students regarding the fundamental principles underlying equipment operation and analysis.

c) The technical topics covered in CHEG 239W include heat exchange, evaporation, distillation, membrane separations, pumps, and fluid flow. The use of statistics in designing experiments and analyzing data is introduced.

Engineering professionalism is also stressed. Students are instructed not use reports produced by other students to inform their work (misrepresentation). Fabrication or falsification in research, aiding or abetting and plagiarism are also discussed . The Preparation of Laboratory Reports that the students receive contains a section on “Forms of Academic and Scholarly Misconduct” taken from the University of Connecticut publication, *Responsibilities of Community Life.*