Catalog Description
Experiments with chemical engineering unit operations including the use of computer data acquisition. Covers control system instrumentation and development of empirical models from process data. Includes written and oral reports. Prerequisites are CHME 307 and CHME 324L (or 322L).

Textbook
None. All course materials are available on Canvas.

Course Objectives
• Understand and apply engineering experimentation techniques and safety procedures common to the chemical industry.
• Apply principles developed in chemical engineering courses to the analysis of chemical engineering processes and unit operations.
• Improve technical writing skills.
• Improve skills necessary for group work—interpersonal skills, coordination of the efforts of several persons, leader and subordinate roles, etc. Introduce students to practical skills needed to be able to apply the scientific and engineering concepts acquired in earlier coursework.

Topics Covered
• Process Control
• Fluidized Bed

Class/Laboratory Schedule
1 credit hour; meets for 2 hours, 40 minutes per week

Instructor: Daniel Gulino; EC3 333; 575-646-2258 (office) or 740-517-2389 (cell, no later than 9 p.m.); gulino@nmsu.edu

Office hours: Monday, Wednesday, Friday, 11:00 a.m. – 12:30 p.m.; other times by appointment

Performance Evaluation

<table>
<thead>
<tr>
<th></th>
<th>Per Event</th>
<th>Total for Course</th>
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<tbody>
<tr>
<td>Pre-Lab Reports</td>
<td>2 x 40 each</td>
<td>80 pts</td>
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<tr>
<td>Final Reports</td>
<td>2 x 60 each</td>
<td>120</td>
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<td>Total</td>
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Grading scale: 90-100 A, 80-89 B, 70-79 C, 60-69 D, <60 F.

Canvas Site
Please check the course Canvas site daily for announcements and course material. Canvas may also be used to communicate with the course instructor.
Common Syllabus Addendum
The NMSU Department of Chemical and Materials Engineering maintains online a syllabus addendum containing course requirements common to all courses with the CHME prefix. This document is accessible at the URL: http://http://chme.nmsu.edu/academics/syllabi/chme-common-syllabus-addendum/

The Addendum covers Attendance Policy, Student Accessibility Services, Misconduct, Cell Phone Use, Re-Grades, Student Work Products, Communication, Video Surveillance, Computer Resources, Etiquette, and Firearms.

Performance Evaluation

There are two experiments. Instructions for each are on Canvas. The reporting for each will consist of both pre-lab and final reports.

Grading expectations for pre-labs and final reports are attached. In other words, these lists show what I am expecting to find in your pre-lab and final reports, but I am not specifying a format. The structures of your reports are entirely up to you as a group as you decide how best to convey your findings and your interpretation of them.

Each team will submit a single report for each experiment, and final grades will be determined based on the scores on these reports weighted 40% pre-lab report and 60% final report.

Pre-lab reports will likely be in the 3 to 6 page range in length, and final reports will likely be in the 4 to 8 page range in length. There is no required structure to the reports. Rather, as noted above, a description of pre-lab report expectations is below, and it is up to the group to determine how best to organize and present that information.

<table>
<thead>
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<th>Points Per Experiment</th>
<th>Pre-lab</th>
<th>Final Report</th>
<th>Safety</th>
<th>Teamwork</th>
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<tr>
<td></td>
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<td>total for course</td>
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</tbody>
</table>

Grading scale: 90-100 A, 80-89 B, 70-79 C, 60-69 D, < 60 F.

How the Course will Operate

Please see the attached schedule. Group memberships will be determined at the first class meeting. The pre-lab report are due to the instructor three hours (by 10 a.m.) on the day of the lab period during which you perform the work.

Safety is of prime importance in this laboratory. Eye protection is mandatory the moment you enter the lab. While the experimental apparatus is generally well-behaved, you will at times be working with gases or liquids under pressure as well as at elevated temperatures. For the heat exchanger experiment in particular, steam is used as a heat source, and the exposed valves and pipes through which it passes can become hot enough to cause burns. Be careful before you touch something. Wear gloves. Be aware of the other experiments going on around you.
General Safety Rules:

1. Safety glasses with sideshields or safety goggles (when handling hazardous chemicals). Neckties, dangling clothing or jewelry, and other unsafe items are prohibited. Long pants are recommended.
2. Horseplay of any sort is absolutely prohibited in the laboratory.
3. Smoking and open flames are prohibited in the laboratory.
4. Safety precautions in the experimental plan must be followed.
5. No operating equipment will be left unattended. At least two members of the group must be present while the equipment is operating.
6. The laboratory floor must be kept dry, clean, and uncluttered at all times. Any spills should be cleaned up immediately.
7. Familiarity is expected with the safety aspects of all the chemicals used in the laboratory and with the coding system used to label containers and pipelines.
8. Any accident or hazardous situation must be reported to the teaching assistant or laboratory instructor immediately.

Prior to writing your pre-lab report for each experiment, your group is required to meet with the instructor in the lab to go over the experimental apparatus. These meetings are up to 15 minutes in length and take place according to the attached schedule. Note that the time of your group’s pre-lab meeting depends on which experiment you are doing, not what group you’re in.

Final reports for each experiment are due by 1 p.m. one week following the final scheduled lab period for that experiment.

Note on the schedule that you will have time off during the semester. You are not expected to attend the lab during your off weeks, but pay attention to the schedule so that you are ready for the next block in which you do have an experiment and when your next pre-lab meeting is.
Pre-Lab Report Expectations

1. Writing style is professional throughout, does not use jargon or casual or informal language or terms, uses the appropriate tense and “person” at all times, and reads as though written by one person.
2. There are no grammatical, spelling, or typographic errors. The level of English is at or above what would be expected from writers at the college level.
3. Figures, tables, references, and equations are properly displayed, formatted, labeled, and captioned as appropriate following standard conventions.
4. The experimental objective is clearly and concisely stated.
5. Experimental methodology is described in adequate detail including a test matrix or something similar if appropriate.
6. How the data is to be analyzed is clearly explained with sample calculations presented as appropriate.
7. Safety issues, including electrical, mechanical, and chemical hazards, are identified and addressed.

Final Report Expectations

1. Writing style is professional throughout, does not use jargon or casual or informal language or terms, uses the appropriate tense and “person” at all times, and reads as though written by one person.
2. There are no grammatical, spelling, or typographic errors. The level of English is at or above what would be expected from writers at the college level.
3. Figures, tables, references, and equations are properly displayed, formatted, labeled, and captions, as appropriate following standard conventions.
4. The experimental objective is clearly and concisely stated. At the conclusion of the report, discussion returns to the objective and addresses whether or not it was met.
5. Experimental methodology generally references the pre-lab with any changes or deviations from what was presented in the pre-lab report explained and justified.
6. Experimental results are clearly and concisely presented and appropriately quantitative versus qualitative.
7. Discussion includes comparison of results with expectations, sample calculations where appropriate, and an analysis of error.
8. Conclusions do not present results not already presented earlier in the report, address all areas of the experimental work, and address whether or not the objectives were met.

Syllabus Preparation Date
Prepared on August 19, 2015 by Daniel Gulino