Spring 2019

CHE 496-002: Chemical Engineering Laboratory II

Irina Molodetsky

Chemical Engineering Laboratory II
ChE496-002
3 credits

Laboratory Experiments
Tuesdays-Thursdays, 1 pm – 4 pm. Tiernan Hall: Labs B7, 206, 311

Course Instructor: Irina Molodetsky

Office hours: Room 350 Tiernan Hall
Monday, 1:00 pm-2:30pm; Wednesday: 3:00pm-5:00 pm
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Specific course information

a. **Description:**

In this second course in chemical engineering capstone laboratory, experiments are conducted in the areas of mass transfer, separations, reaction engineering, and process dynamics and control. Bench and pilot-scale equipment is used. Oral and written reports are prepared by the students.

b. **Prerequisites:** ChE 349, 360, 380, 396, Chem 339, Math 225A
Co-requisites: ChE 460, 489
c. **Required, Elective, or Selective Elective** – Required

Textbook
R. Barat "Manual for ChE 496 Chemical Engineering Laboratory II" Otto H. York Department of Chemical and Materials Engineering, Newark, NJ 07102. The last version of the manual is uploaded to the Moodle page of the course http://moodle.njit.edu

Specific goals for the course

a. The student will be able to:
1. Plan an experiment and take enough data to get meaningful results
2. Operate and analyze a dynamic chemical process under unsteady conditions
3. Operate a continuous separation or mass transfer process, and collect sufficient product concentration data of acceptable quality
4. Operate a chemical reactor, and collect sufficient quality data on conversion, products, and/or reactor temperature
5. Operate a chemical process which demonstrates process safety issues
6. Operate a chemical process which demonstrates active feedback process control
7. Apply theoretical models (steady or unsteady) appropriate to simulate the experiment performed

8. Analyze correctly and handle ethically experimental and modelled data
9. Present critically the results and draw useful conclusions
10. Present the results using quality plots and tables that reveal key relationships
11. Report the data and analyses in a manner consistent with the assigned reporting structure
12. Conduct a technical literature review associated with the laboratory experiment
13. Complete a hazards analysis and risk control prior to an experiment
14. Provide recommendations for the improvement of the experiment and suggest Further Research
15. Work in a team, assume various responsibilities, create supportive and collaborative environment for each team member

Course Structure

- Laboratory experiments are completed in teams.
- Each team will conduct four experiments. Each laboratory experiment contributes 25% to your total grade.
- Each experiment requires Pre-Experiment Plan and Risk Assessment
    - Three laboratory experiments require a written report in the format of a scholarly paper. Grading Rubric is on Moodle
    - One laboratory experiment will be presented to your peers (team presentation; ppt format). Grading Rubric for Oral Presentation is on Moodle
- The laboratory experiments include modeling and prediction components. Completion of these components requires a math software package (for example, Polymath, which is available on all ChE computers).

- This course will use the NJIT Moodle site accessed by http://moodle.njit.edu for all communications regarding changes in the schedule, status of the experiments, score rubrics, files and documents.
- The manuals for laboratory experiments are uploaded to Moodle site.
    - These manuals reflect a sustaining, multiyear effort of Prof.R.Barat to develop an experimental course for chemical engineers. As we upgrade and change our experiments, the manuals are undergoing continuous improvement.
- This course gives you unique opportunities to apply knowledge you gained from the theoretical courses to real-life open-ended problems.

Professional behavior

- You are expected to follow the laboratory safety standards.
    - General guidelines are discussed at length in the Lab Manual – Introduction.
    - Every laboratory experiment includes specific safety guidelines.
    - Every team will be required to complete a risks assessment prior to running a specific laboratory experiment.

- Participation of each member of the team is critical and will be evaluated by the team members, as well as by the instructor. These evaluations will affect the final grade.

Policy on Academic Integrity

Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found at:

http://www5.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf.

Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. ***Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university.*** If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at *dos@njit.edu*"

www.njit.edu/academics/pdf/academic-integrity-code.pdf

Accommodations due to a disability

If you need accommodations due to a disability please contact Chantonette Lyles, Associate Director of Disability Support Services, Fenster Hall Room 260 to discuss your specific needs. A Letter of Accommodation Eligibility from the Disability Support Services office authorizing your accommodations will be required.