Spring 2022

CHE 496-002: Chemical Engineering Lab II

Irina Molodetsky

- Chemical Engineering Laboratory II

ChE496

- Credits and contact hours

0-6-3 (0 lecture hr/wk-6 hr/wk-3 course credits)

Tuesday, Thursday 1:00 pm-3:50 pm

Tiernan Hall: 411, B7, 311
https://njit.webex.com/meet/molodetsnjit.edu

- Instructor: Irina Molodetsky

https://njit.webex.com/meet/molodetsnjit.edu
email: Irina.Molodetsky@njit.edu

- Textbook

R. Barat and I.Molodetsky "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 Canvas page of the course http://canvas.njit.edu

- 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

- Specific goals for the course

a. The student will be able to:
   1. Plan the experiment and discuss the applicable experimental techniques prior to experimental work
   2. Perform Hazards Assessment and Risk Control of the laboratory experiment
   3. Work effectively in a team, assume various responsibilities, create supportive and collaborative environment for each team member
   4. Successfully apply theoretical models (steady or unsteady) appropriate to simulate the experiment performed
   5. Develop and conduct an experiment involving process safety issues and active feedback control, and collect good quality data
   6. Ethically and correctly handle, analyze and interpret data, leading to conclusions and suggestions on further work
   7. Report the data and analyses in a manner consistent with the assigned reporting structure

b. This course specifically addresses the following students outcomes: 1,3,5,6,7

- Topics

1. Continuous Stirred Tank Reactor (CSTR) – reaction, dynamics
2. Non-Catalytic Batch Reactor (NCBR) – reaction, dynamics, safety
3. Tubular Flow Reactor (TFR) – reaction
4. Catalytic Batch Reactor (CBR) – reaction, dynamics, safety, control
5. Semi-Batch Reactor (SBR) – reaction, dynamics
6. Continuous Distillation (CD) – separation, dynamics, control
7. Batch Distillation (BD) – separation
8. Reactive Absorption (RABS) – separation
9. Packed Column Absorption (PCA) – separation, dynamics, control, safety

- Course Structure

- Laboratory experiments are completed in teams. Personal effectiveness competencies are assessed using CATME tool.
- Each team will conduct four experiments
- Each experiment requires preparation (Pre-Experiment Plan and Risk Assessment)
- Two laboratory experiments require a written report in the format of a scholarly paper. Grading Rubrics are on Canvas
- Two laboratory experiments will be presented to your peers and invited graduate students (team presentation; ppt format). Grading Rubrics for Oral Presentation are on Canvas
- Face-to-face or Webex Team discussions of the collected data are mandatory for each experiment
- The laboratory experiments include modeling and prediction components. Completion of these components requires a math software package (for example, Polymath, Matlab) available for all students

- Communication

This course will use the NJIT Canvas site accessed by http://canvas.njit.edu for all communications regarding changes in the schedule, status of the experiments, score rubrics, files and documents.
All online communications are done on webex https://njit.webex.com/meet/molodetsnjit.edu unless other address is specified
Online individual or team discussions are scheduled on Canvas and require you to sign up to a specific slot.
Online communication with the entire class is done through **Webex** hosted by the instructor

- Grading

The number of points awarded to a student for a specific experiment is a composite of the preparation (20%) and written submission or oral presentation (80%) adjusted by CATME coefficient calculated for each experiment.

Instructor reserves the rights to overwrite CATME coefficient.

Above 90	A
Above 85	B+
Above 80	B
Above 75	C+
Above 70	C
Above 60	D
Below 60	F

- Professional behavior

- You are expected to follow the laboratory safety standards.

  Participation of each member of **the team** is critical and will be evaluated by all team members, including self-assessment, as well as by the instructor (CATME)

  - 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.