

CHME 352L – Unit Operations Simulations

Spring Semester 2024



Class Schedule: Fridays 9-10:15 AM Jett Hall 177 (CHME computer lab)

No class or office hours March 11 – 15 (Spring Break), March 29 (Spring Holiday)

Catalog Description:

CHME 352 L. UNIT OP SIM (2 credit hours)

Definition, specification, and convergence of basic unit operations in a process simulator. Course will cover how to access variables, define and converge design specifications and converge tear/recycle streams. Prerequisite(s)/Corequisite(s): CHME 307, CHME 441. Restricted to: CHME majors.

Required Textbook: This course will use content from the texts required of the co-requisite courses.

Audience: This class is intended for chemical engineering undergrads. It is one of the core courses.

Instructor: Dr. Tom Manz
Office: Jett Hall Rm 150
Email: tmanz@nmsu.edu (email is the preferred method of contact)
Phone: 575-646-2503 (office)

Final Exam: No final exam.

Course Objectives:

Upon completion, you will be able to apply Aspen Plus® programming solutions to specify and converge unit operations involving:

- non-rigorous balance units (RSTOIC, SEP, MIX, FSPLIT, SSPLIT DUPL)
- pressure changers (PUMP, COMPR, VALVE)
- pipe networks (PIPE, PIPELINE)
- heat exchangers (HEATER, HEATX)
- reactors and kinetic models (RPLUG, RCSTR, BATCH, REQUIL, RGIBBS)
- flash drums and decanters (FLASH2, DECANTER)
- distillation columns (DSTWU, intro to RADFRAC)

Grading:

The total point accumulation and final grade distribution for this course will be as follows:

Lab assignments: 100 %

Grading Standard*

5 points – problem solution completely correct
4 points – logic of solution basically correct, numerical error in solution
3 points – error in logic of solution, but solution thought through to end
2 points – incomplete solution, approximately half completed
1 point – solution attempted, but less than half completed
no points – no attempt at solution

*Rubric applies to lab assignments. An additional exam rubric will be provided later.

Grading Scale: 90-100% A; 80-89% B; 70-79% C; 60-69% D; below 60% F

Lab report format: *(Please upload all of your lab reports to Canvas using the following format.)*

1. Include a neatly typed cover page (1-2 pages in total length) that includes your name and a title of the lab assignment(s). This cover page should first start by briefly giving the problem statement and/or list of tasks that were completed in the lab assignment. You may describe the tasks either narratively in a paragraph or as a chronological list of tasks. If your goal is to calculate specific quantities, briefly summarize what is being calculated. Also, summarize what inputs to the problem you provide and what theoretical/computational models (if any) were used (such as which equations of state, etc.). Then, briefly in 1-2 paragraphs explain what you did. Then summarize your main results either in narrative form or by providing a list or table. If your laboratory assignment has several unrelated simulations (e.g., first simulate a pipe and then simulate a valve, please repeat the above sequence for each part). Type all of this in a Microsoft Word document and save it as a pdf.
2. Include your output printouts and process flow diagrams from Aspen as attachments either in the same pdf file or as a separate attachment.

Upload both # 1 and # 2 to the Canvas home page. **Note: Please do not spend more than 2 hours on each report.** You do not have to include every detailed step (e.g., first “click this, then click that” is too fine of a level of detailed procedure).

Computers are available for you to use in the following locations with ASPEN software: Jett Hall room 177 (CHME computer lab).

Computer information: This is a computer-based class. If you have problems with accessing or logging into any computer, losing files, loading computer programs, frozen screens, sluggish operating systems, etc. please contact COE Helpdesk (coehelp@nmsu.edu). When contacting a help desk, please provide as specific information as possible; the more specific information you provide, the more likely they can resolve your problem.

Online resource: Course related content will be posted on **canvas**, which is accessed via **nmsu.instructure.com**.

Withdrawals: Students **will not** receive an automatic drop for persistent absences or persistent failure to complete assignments. The responsibility for withdrawals is completely up to the student.

Working together on assignments: Teamwork on homework is encouraged for learning purposes. However, all assignments turned in by the student must show the **student's own work (not be a copy or identical to other student's work – each problem must be worked by each student)**. All examination and quiz answers must be **strictly one's own work**. Copying homework or allowing others to copy your homework is strictly forbidden. See the Common Syllabus Addendum for more details.

Incomplete Grades: A grade of Incomplete (I) is given **only if the student is passing** and cannot complete the required work for reasons beyond the student's control that develop after the last day to withdraw from the course.

Common syllabus addendum (policies that apply to all CHME courses): see <https://chme.nmsu.edu/academics/chme-common-syllabus-addendum.html>