Catalog Description—Chemical Engineering basic problem solving skills; unit conversions; elementary stoichiometry; material balances; sources of data. Chemical engineering majors must earn C or better in this course.

Prerequisites – CHEM 115, MATH 190


Course Objectives—Upon completion, students will be competent in areas noted in Topics Covered.

Topics Covered—By the end of the course, you should be able to do the following things:

• Mathematical Solutions; generate plots (x vs. y) and perform linear regression, solve systems of linear algebraic equations
• MATLAB®, MathCAD and Excel: solve basic engineering and math problems using built-in functions, plot, use arrays and matrices; perform simple programming operations, apply general spreadsheet functions to graphs, formulas, and formatting cells
• Engineering Calculations: convert quantities from one set of units to another, identify units for mass and weight, identify the number of significant figures in a given value, calculate the mean and standard deviation, use linear interpolation, sketch an x vs. y plot
• Processes: calculate density, mass, volume, mass fraction, and mole fraction; calculate compositions of mixtures; convert a manometer reading into a pressure difference; convert among temperatures
• Material Balances: explain batch, semibatch, continuous, transient, and steady-state processes; explain recycle, purge, degrees of freedom, fractional conversion of limiting reactant, percentage excess of reactant, yield and selectivity, dry-basis composition, and theoretical air and percent excess air in combustion reactions; draw a flowchart; perform degree-of-freedom analysis; perform a single and multi-unit material balances; explain ideal gas behavior, compressibility, physical properties; carry out PVT calculations; use equations of state in calculations; perform calculations of V and m with mixtures of liquids, calculate partial pressures, total gas pressures, or determine mixture compositions; explain separation process, distillation, adsorption, scrubbing, liquid extraction, absorption, leaching, crystallization; sketch a phase diagram, estimate vapor pressures; use the Gibbs phase rule; explain saturated vapor, superheated vapor, dew point, degrees of superheat, relative saturation; use Raoult’s law to perform calculations with equilibrated gas-liquid systems; explain and use in calculations terms related to ideal solution behavior, bubble point, boiling point, dew point, vaporization, boiling, solubility, saturated solutions, hydrated salt, distribution coefficient, adsorption isotherm

Class Schedule—Tuesday/Thursday 10:20AM-11:35AM, Jett Hall Room 283
Instructor Information
Dr. Jessica P. Houston, Ph.D.
Assistant Professor
College of Engineering
Department of Chemical Engineering
Office: NMSU campus, Jett Hall Room 255
PO Box 30001 Las Cruces, NM 88003
jph@nmsu.edu office: 575-646-5563

Policies and Procedures for this Class

Teaching Assistant:
The TA for this course is Joshua Alcala, jaalcala@nmsu.edu. Josh is a chemical engineering graduate student and will assist Dr. Houston in this course. Josh will grade your homework and substitute for Dr. Houston only if she has to be out. Dr. Houston will grade your exams and projects. Josh can answer questions about homework and your homework grades. Please email Josh for his availability.

Learn.nmsu.edu
In this class be prepared to use Canvas. Canvas is a website specifically designed for grades, course information and homework assignments; it will be used by Dr. Houston extensively throughout the semester. To access this website go to learn.nmsu.edu. Dr. Houston will upload pertinent class information to the ChE 111 class Canvas site including the syllabus, course calendar, homework assignments, and your grades. Additionally students will be expected to upload homework, exams, and project solutions to the Canvas website when they are completed.

Assignment Information
A "course calendar" will be provided with details about when and what assignments (homework, exams, quizzes) are due. The calendar will be posted on the Canvas website and will be subject to modification. Refer to the "course calendar" often to be sure you are following the latest version.

All student homework is to be done either by hand on paper or using MATLAB, MathCAD or Excel. All homework will be submitted by uploading all your files to the Canvas class webpage by 5PM on the day it is due. The webpage assignment folder will close by 5PM and therefore no late submissions will be accepted. All homework must be labeled with the student name, section, and date. Working together is encouraged. However, DO NOT plagiarize, blatantly copy homework solutions from other sources or allow other to blatantly copy your own homework solutions.

Computer Information
Sometimes we will use the chemical & materials engineering computer laboratory in this class. You also will sometimes complete homework using the computer in this lab. The chemical & materials engineering computer laboratory is a room with a cluster of computers and printers for chemical engineering students and is located in Jett Hall room 169. The computer lab is accessible 24 hours a day 7 days a week. There is a strict no food and drink policy in this laboratory. You will be revoked of your computer privileges if you do not abide by the rules.
To access the chemical & materials engineering computer lab you must first go to the department secretary (Ms. Carol Dyer) at the department main office (Jett Hall room 159) to obtain the key access code. More information about access and computer lab policies are found at the following website: http://chme.nmsu.edu/research/facilities/computer-use-policy/

If you have a problem logging into any computer, please contact NMSU IT helpdesk by either of these two options:
1. Send an email to coehelp@nmsu.edu and detail your problem in the message; or
2. Log into http://coehelp.nmsu.edu/ with your MY.NMSU username and password.

NMSU IT will help with computer accounts, problems logging into the NMSU computers, issues with paper allotment for printing, and problems accessing software.

**Grading Point Distribution**

Exam I (100 points)—20%; Exam II (100)—20% Exam III (100)—20%; Exam IV (100)—20%; each; Final (100)—10% Homework (100*)—5%; Quizzes (100*)—5%

*HW and Quiz scores will be normalized.

**Grading Scale**

A ≥ 90%; B ≥ 80%; C ≥ 70%; D ≥ 60% No fractional grades will be given.

**Grading Standard for each problem**

10 points - problem solution completely correct
9 points - logic of solution completely correct, numerical error in solution
7 points - slight error in logic of solution, but solution thought through to end
5 points - moderate logic error in solution
3 points - major logic error in solution
1 points – valid attempt, but incorrect logic
no points - no attempt at solution

The NMSU Department of Chemical Engineering maintains a syllabus addendum containing course requirements common to all courses with the CH E prefix online. This document is accessible from the URL: http://chme.nmsu.edu/academics/syllabi/#CHME_Common_Syllabus_Addendum

**Syllabus Preparation Date**

- 1/12/15