

## CHEMICAL ENGINEERING ANALYSIS I

Summer 2016 - May 31 to July 8  
Monday through Thursday 12:55 pm to 2:50 pm

14:155:201:B6:00836  
SEC-117

---

### *Course Objectives:*

This course is designed to assist students begin to think as chemical engineers and prepare for a career in the chemical engineering profession. Each student should become familiar with a wide variety of material and energy balance problems found in chemical, biochemical, and biomedical applications. The course also provides an introductory basis for subsequent classes in mass, momentum, and heat transport at the sophomore and junior levels, thermodynamics at the sophomore level, and process engineering design courses at the senior level.

### *Instructor:*

J. L. Rankin, Assistant Dean (Retired)  
jerankin@rci.rutgers.edu  
Office Hours: By Arrangement

### *Textbook (Required):*

Felder, Richard M., and Ronald W. Rousseau, Elementary Principles of Chemical Processes (3rd Edition), John Wiley and Sons, New York, NY, 2005 (ISBN 0-471-68757-3)

### *Grading Policy:*

Your final grade will consist of a combination of examination, homework, and quiz scores as indicated below. Midterm examinations will be given during regular class time. The final examination will be held during the last class meeting as indicated on the attached class schedule. Homework problem solutions are VERY IMPORTANT in successfully completing the course. Those that fail to spend adequate time on homework assignments will typically do poorly on scheduled examinations. Each assignment will be due at the beginning of class on the date stated. The assignments will be equally weighted in the final grade calculation. Late assignments will receive a maximum of 50% of credit unless cleared with the instructor previously. Working in small groups on homework assignments is encouraged, but each student in the group must learn how to solve every problem assigned. If emergencies arise which preclude your attendance at lectures or examinations, let me know as soon as possible. I will attempt to be reasonable and fair in working out arrangements to our mutual satisfaction.

<i>Grade Calculation:</i>	Homework Assignments	20%
	Midterm Examination #1	25%
	Midterm Examination #2	25%
	Final Examination	30%

The course will be fully distributed, i.e., there will be grades from A to F (if necessary).

*Academic Integrity:*

A simple direct statement should suffice. **NO CHEATING OF ANY KIND WILL BE ALLOWED.** Any student who violates university integrity policy will be reported and prosecuted. Let us all remember that this is a first course in the professional program of Chemical and Biochemical Engineering and we ought to act as true professionals as we study together. Any student who observes dishonesty in others should feel free to converse with the instructor about the problem.

*Homework Format:*

All homework assignments are to be submitted on 8 1/2" x 11" paper. Each page of the assignment should be numbered at the top along with your name. Problems should be done neatly and presented logically with all final answers boxed for easy identification. Get in the habit of presenting your work so that others can follow your reasoning and understand your ideas. We will be doing complex problems with multiple parts so clear presentation is essential to obtain high marks.

Engineering computation paper is preferred though not required. This paper is available at the Rutgers Bookstore and other office supply stores in the area such as Staples, OfficeDepot, OfficeMax, etc.

## COURSE SCHEDULE

<u>Date</u>	<u>Topic</u>	<u>Reading</u>	<u>Assignment Due</u>
May 31 (Tue)	Course Introduction,	1	-----
Jun 1 (Wed)	Unit Systems	2.0 – 2.4, 2.6	-----
Jun 2 (Thu)	Flow and Composition	3.0 - 3.3	-----
Jun 6 (Mon)	Pressure and Temperature	3.4 – 3.6	#1
Jun 7 (Tue)	Material Balance Principles	4.0 – 4.3	-----
Jun 8 (Wed)	Multiple Unit Material Balances	4.4 – 4.5	-----
Jun 9 (Thu)	Reactive System Balances I	4.6 – 4.7	#2
Jun 13 (Mon)	<b>MIDTERM EXAMINATION #1</b> (Pages 1 through 116)		
Jun 14 (Tue)	Reactive System Balances II	4.8 – 4.10	-----
Jun 15 (Wed)	Single Phase Systems: Ideal Gases	5.0 – 5.2	-----
Jun 16 (Thu)	Equations of State: Nonideal Gases	5.3 – 5.5	-----
Jun 20 (Mon)	Multiphase Systems	6.0 – 6.3	#3
Jun 21 (Tue)	Energy Balances I	7.0 – 7.4	-----
Jun 22 (Wed)	Energy Balances II	7.5 – 7.8	-----
Jun 23 (Thu)	Nonreactive Energy Balances	8.0 – 8.4	-----
Jun 27 (Mon)	<b>MIDTERM EXAMINATION #2</b> (Pages 116 through 255)		
Jun 28 (Tue)	Heats of Reaction	9.0 – 9.4	-----
Jun 29 (Wed)	Reactive Energy Balances	9.5	#4
Jun 30 (Thu)	Combustion Systems	9.6 – 9.7	-----
Jul 4 (Mon)	<b>NO CLASS</b> – Independence Day Holiday		
Jul 5 (Tue)	Reactive Balances Practice	-----	-----
Jul 6 (Wed)	Computer-Aided Calculations	10.0 – 10.2	#5

Jul 7 (Thu) ***FINAL EXAMINATION*** (Comprehensive)

NOTE: The following portions of the book will not be included in the examinations:

Sections 2.5 and 2.7

Sections 6.4, 6.5, 6.6, and 6.7

Section 8.5

Chapters 11, 12, 13, and 14