1/12/2016

ROWAN UNIVERSITY
DEPARTMENT of CHEMICAL ENGINEERING

Course

CHE 06.314
Separation Processes II

Time

Sec 1
M 12:30 - 1:45 PM (ROW 102)
W 8:00 AM – 10:45 AM (ROW 102)
F 8:00 – 9:15 AM (ROW 102)

Sec 2
M 2:00 - 3:15 PM (ROW 340)
W 11:00 AM – 1:45 PM (ROW 340)
F 9:30 – 10:45 AM (ROW 340)

Instructors

Dr. C. Stewart Slater
336 Rowan Hall (256-5312)
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Office hours as posted

Prof. Jesse Van Kirk
312 Rowan Hall (256-5310)
vankirk@rowan.edu
Office hours scheduled by request

Course Description

This course is the second course of a two semester sequence in mass transfer and separation processes. The course presents several separation processes and their relevant theory, design and applications for gas, liquid and solid separation in both traditional and emerging industries.

Pre-requisites: Process Fluid Transport, CHE 06.309 (D-); Separation Processes I, CHE 06.312 (C-); ChE Thermodynamics I, CHE 06.315 (D-)

Text

"Transport Processes and Separation Process Principles," 4th Ed., C. Geankoplis, Prentice Hall Publishers, Upper Saddle River, NJ, 2003.
Hand-outs, and selected readings as provided

Web resources

BlackBoard BB

Objectives

Apply vapor-liquid equilibrium data and relationships to distillation
Analyze binary distillation using the McCabe-Thiele method
Analyze multicomponent distillation using the FUG method
Understand the basic differences (theory, design and applications) between the family of membrane processes
Apply membrane mass transfer and design equations to solve system parameters for reverse osmosis, gas permeation, ultra/microfiltration, and other membrane operations
Understand the principles, operation and design of solid-fluid and liquid-liquid separation processes such as centrifugation and particle filtration and their governing relationships
Apply equilibrium data to various adsorption isotherms and determine constants

Understand adsorption operations using batch systems and packed columns for gas and liquid separations
Apply chemical engineering fundamentals and design strategies to other separation processes and manufacturing operations

Content

Tentative Week/Topic Schedule VanKirk/Slater

Week	Dates – M, W, F			Topic (Geankoplis Chapter)
1		Jan 20	Jan 22	Introduction Distillation (Ch 11)
2	Jan 25	Jan 27	Jan 29	Distillation (Ch 11)
3	Feb 1	Feb 3	Feb 5	Distillation (Ch 11)
4	Feb 8	Feb 10	Feb 12	Distillation (Ch 11), Membrane Processes (Ch 13)
5	Feb 15	Feb 17	Feb 19	Exam I, Feb 17 Membrane Processes (Ch 13)
6	Feb 22	Feb 24	Feb 26	Membrane Processes (Ch 13)
7	Feb 29	Mar 2	Mar 4	Membrane Processes (Ch 13)
8	Mar 7	Mar 9	Mar 11	Membrane Processes Particle Filtration / Centrifugation (Ch 14)
9	*Mar 14* *No Class*	*Mar 16* *No Class*	*Mar 18* *No Class*	No Class – Spring Break
10	Mar 21	Mar 23	Mar 25 *No Class*	Exam II, Mar 23 Particle Filtration / Centrifugation (Ch 14) Good Friday (No Class)
11	Mar 28	Mar 30	Apr 1	Particle Filtration / Centrifugation (Ch14),
12	Apr 4	Apr 6	Apr 8	Centrifugation (Ch 14)
13	Apr 11	Apr 13	Apr 15	Particle Filtration / Centrifugation (Ch14), Exam III, April 13 Adsorption Processes (Ch 12)
14	Apr 18	Apr 20	Apr 22	Adsorption Processes (Ch 12)
15	Apr 25	Apr 27	Apr 29	Adsorption Processes (Ch 12)
16	May 2	* TBA		*Exam IV (conducted during Finals wk, May 4-9)

Exam I covers Distillation
Exam II covers Membrane Processes
Exam III covers Particle Filtration/Centrifugation
Exam IV covers Adsorption Processes and is placed in the “final exam period”

Topics may be changed due to weather, time constraints, etc. Students will be informed of changes in course policy and conduct as appropriate. You are responsible for all material presented in class, texts, handouts, assigned readings, homework, etc.

Grading Policy:

Exam I (25%), Exam II (25%), Exam III, (25%), Exam IV (25%)
Homeworks, Labs, In-class Problem solving activities, etc are meant to reinforce lecture concepts and help you succeed on exams – therefore no point assignment will be given to these activities. Although, as in any course, if you don't actively engage yourself in self-directed learning activity, you will not be prepared to succeed on exams.

Attendance

Attendance is consistent with University policy and you need to attend class to participate which is part of your grade. You will need to be in class to engage in any in-class workshops, labs, or other activities. If you are not in class for any reason, it is your responsibility to get the materials covered in the lecture from your classmates.

Professionalism and Safety

Responsibilities: To succeed in this class, you should come to class prepared, ask questions on points that you do not understand, and attempt all homework problems. In this class, if you have not worked diligently on the homework assignments, don't follow what is covered in class, and do not read the book (including the examples/exercises that are in the book), the tests will be difficult. Doing only one third of the homework problems and not reading the book while your teammates do the work is a recipe for disaster in this course. We will lecture on material (that covered in the book and some not), make ourselves available for questions both in and out of class, attempt to answer all serious questions, and administer fair but demanding exams.

Policies:

1. Regular attendance is expected. You are responsible for all material whether you are in class or not.
2. Proper safety protocols must be followed in the laboratory at all times.
3. Late work of any kind will not be graded, you have multiple team members – one must be able to hand in the work for the group on time.
4. Collaboration in study teams for homework is acceptable and encouraged, but all tests must be done independently.
5. If you feel that a test problem has been graded improperly (except for miscalculation of points), you must resubmit the problem within 24 hours along with a written appeal and explanation. Upon receipt of this formal appeal, we will regrade the problem. This means that your score may go up or down.
6. Academic dishonesty of any kind will result in failure for the course. Academic dishonesty includes, but is not limited to, copying on an exam, submitting work performed by another as your own, tampering with or in any way altering another persons work without their knowledge and consent, and misrepresenting your contribution to a group project.
7. Students are expected to conduct themselves in an acceptable manner at all times. Students who violate public law or the rights of others and interfere with the educational process will be referred to the proper authorities. Course final grade will be reduced for unprofessional conduct in class, failure to follow proper safety procedures, disruptive activity or other behavior as deemed not appropriate.
8. Professional conduct is required in class at all times. Examples of unprofessional conduct include coming to class late, doing work for another class or activity while in this class, using a cell phone, PDA or other device to text, view internet sites or perform other

functions, disrupting your neighbor, etc. Students are not permitted to use a laptop in class unless otherwise instructed to do so.

9. No digital audio or video recording, or photographing any class activity without prior consent of the instructor
10. Course final grade will be reduced for unprofessional conduct in class or not following rules / class policy as described above.

Your academic success is important. If you have a documented disability that may have an impact upon your work in this class, please contact me. Students must provide documentation of their disability to the Academic Success Center in order to receive official University services and accommodations. The Academic Success Center can be reached at 856-256-4234. The Center is located on the 3rd floor of Savitz Hall. The staff is available to answer questions regarding accommodations or assist you in your pursuit of accommodations. We look forward to working with you to meet your learning goals.