

ROWAN UNIVERSITY
DEPARTMENT of CHEMICAL ENGINEERING

Course

CHE 06.314 1
Separation Processes II

Time

Spring 2009
M 12:15 - 1:30 PM (Rowan 340)
W 10:50 - 12:05 PM (Rowan 102)
F 12:15 - 3:00 PM (Rowan 340)

Instructors

Dr. Mariano J. Savelski
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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), Separation Processes I (CHE 06.312)

Text

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

Web resources

Web CT; login at <http://webct.rowan.edu/>

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 and ASPEN simulator
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 and gas permeation
Understand the principles of drying of process materials and the design and operation of various drying separation processes
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 chemical engineering fundamentals and design strategies to other separation processes and manufacturing operations

Content

Tentative Week/Topic Schedule Savelski/Slater

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

Exam I covers Distillation

Exam II covers Membrane Processes

Exam III covers Filtration/Centrifugation Separations and Drying Processes

Final Exam is Comprehensive

Topics may be changed due to 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 (20%), Exam II (20%), Exam III (20%) Final Exam (25%)

Homeworks, Labs, Other Activities, Class Participation and Professionalism (15%)

Individual scores on team-based items will be modified using Felder's "Peer Rating of Team Members" form

Attendance

Attendance is consistent with University policy and you need to attend class to participate and which is part of your grade.

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.

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.