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
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

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