ROWAN UNIVERSITY
DEPARTMENT of CHEMICAL ENGINEERING

Course
CHE 06.314 1
Separation Processes II

Time
Spring 2011
M 9:25 AM - 12:05 PM (Rowan 340)
W 8:00 AM - 9:15 AM (Rowan 340)
F 9:25 AM - 10:40 AM (Rowan 340)

Instructors
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Office hours: open door

Prof. Jesse VanKirk
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Office hours by appointment only

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
Balckboard; login at http://webct.rowan.edu/

Objectives
Apply vapor-liquid equilibrium data and relationships to distillation
Analyze binary distillation using the McCabe-Thiele 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 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
## Tentative Week/Topic Schedule Savelski/VanKirk

<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 19 Jan 21</td>
<td>Introduction Distillation (Ch 11)</td>
</tr>
<tr>
<td>2</td>
<td>Jan 24 Jan 26 Jan 28</td>
<td>Distillation (Ch 11)</td>
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<tr>
<td>3</td>
<td>Jan 31 Feb 2 Feb 4</td>
<td>Distillation (Ch 11)</td>
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<tr>
<td>4</td>
<td>Feb 7 Feb 9 Feb 11</td>
<td>Membrane Processes (Ch 13)</td>
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<tr>
<td>5</td>
<td>Feb 14 Feb 16 Feb 18</td>
<td>Membrane Processes (Ch 13). Exam 1, 2/18</td>
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<tr>
<td>6</td>
<td>Feb 21 Feb 23 Feb 25</td>
<td>Membrane Processes (Ch 13) Thermo Exam 1</td>
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<tr>
<td>7</td>
<td>Feb 28 Mar 2 Mar 4</td>
<td>Membrane Processes (Ch 13)</td>
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<tr>
<td>8</td>
<td>Mar 7 Mar 9 Mar 11</td>
<td>Membrane Processes (Ch 13). Exam 2, 3/11</td>
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<tr>
<td>9</td>
<td>Mar 14 No Class Mar 16 No Class Mar 18 No Class</td>
<td>No Class – Spring Break</td>
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<tr>
<td>10</td>
<td>Mar 21 Mar 23 Mar 25</td>
<td>Particle Filtration (Ch 14)</td>
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<tr>
<td>11</td>
<td>Mar 28 March 30 Apr 1</td>
<td>Particle Filtration, Centrifugation (Ch14)</td>
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<tr>
<td>12</td>
<td>Apr 4 Apr 6 Apr 8</td>
<td>Centrifugation, Particle dynamics (Ch 14) Thermo Exam 2</td>
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<tr>
<td>13</td>
<td>Apr 11 Apr 13 Apr 15</td>
<td>Drying Processes (Ch 9)</td>
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<tr>
<td>14</td>
<td>April 18 Apr 20 Apr 22 (no class)</td>
<td>Drying Processes (Ch 9), Good Friday Holiday</td>
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<tr>
<td>15</td>
<td>April 25 Apr 27 Apr 29</td>
<td>Drying Processes (Ch 9), Exam 3, 4/29</td>
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<td>16</td>
<td>May 2 *X</td>
<td>*Final Exam (Finals week, May 3-7)</td>
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*Exam 1 covers Distillation  
*Exam 2 covers Membrane Processes  
*Exam 3 covers Filtration/Centrifugation Separations and Drying Processes  
^Exams of Chemical Engineering Thermodynamics (this exam uses a double period on Friday 8:00 – 10:40 am)  
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%)  
Homework, 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.
WITHDRAW AND SIGNATURE SCHEDULE
Jan 25 to Mar 7 ................. (W) ............... Student, Professor
Mar 8 to Apr 4 ............... (WP/WF) .......... Prof, Dept Chair
Apr 5 to May 7 ............... (WP/WF) .. Prof, Dept Chair, Dean

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 72 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 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.