Operation of the Course

Meeting Time: TR 11:00 a.m. - 12:20 p.m.
Location: Gilchrist 109 or C.L. Wilson 204
Office Hours: TWR 1:00-2:00 p.m. (or by appointment)

- **Goals**
  To integrate knowledge and skills gained in the undergraduate curriculum, by applying them to process flowsheeting and simulation using Aspen Plus software. We will also introduce elementary sensitivity analysis using advanced features of Aspen Plus. By the end of this course, you should be proficient in process flowsheet development and process simulation using Aspen Plus; and you should have no problems developing a preliminary process flowsheet for your Senior Process Design project.

- **Learning Outcomes**

  **Process Model Simulation**- Students should become familiar with computer-aided simulation of unit operations using Aspen Plus. This includes component selection, stream specification, thermodynamic property method selection, and process block specification.

  **Process Analysis**- Students should be able to run completed, connected process simulations; identify key process operating conditions and unit operation design parameters in results and output windows; and develop proficiency in using Aspen analysis tools to improve process performance, yield, and selectivity.

  **Applied Numerical Methods**- Students should be able to generate process simulation and analysis codes in Matlab; this is includes developing pseudocodes, developing algorithms, and generating codes that can be used to simulate and analyze various aspect of chemical processes.

- **Grading**
  In computing final grades for the course, we shall use the following criteria:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tr>
<td>Assignments</td>
<td>50%</td>
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<tr>
<td>Process Simulations</td>
<td>25%</td>
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<tr>
<td>Individual Memoranda/Assignments</td>
<td>25%</td>
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<tr>
<td>Final Project/Course Evaluation</td>
<td>50%</td>
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<tr>
<td>Class Participation, Attendance, SOS survey, etc.</td>
<td>-10%</td>
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Grades will be assigned on a numerical scale of zero to 100 with 90-100 being the A range, 80-89 being the B range, 70-79 being the C range, 60-69 being the D range, and less than 60 being a failure.

- **Memoranda**
  Good results communicated poorly are only marginally better than mediocre results communicated well. An acceptable memo is neat, brief, well-organized, and written in clear and correct English prose. You should always include the following information: Date, To/From/Subject lines, a summary of work or scope, key assumptions, a fully-labeled free body diagram, and results with analysis/brief discussion. An effective memo should be clear, concise, and informative. Assessment of clarity, organization, neatness, grammar, and style will account for 50% of the total grade.
assigned to an individual memo/project. Deadlines are weekly and represent an important aspect of professional practice. Hence, memos submitted after the due date will not be accepted, unless there are unusual circumstances.

- **Final Project**
  Unless otherwise instructed, all assignments, including the final project, for the course will be done **individually**. You are required to synthesize a flowsheet of a chemical process involving the conversion of one or more raw materials into one or more final product(s) and byproduct(s). You can select these materials according to your own interests. However, your overall process must consist of at least five separate and distinct unit operations. Also, the overall chemical process must include either a CSTR or a PFR unit with rate-controlled kinetics and a rigorous separations scheme that includes azeotropic distillation. Heat and power integration should be incorporated where appropriate or applicable. Your process should be subjected to appropriate analysis based on tools and methods (for example, design spec, calculator blocks, sensitivity analysis, and constrained/unconstrained optimization) that you will learn in this course or that you have learned in other courses. The memorandum for your final project must include a problem statement, design basis, results and discussion, a converged Aspen simulation of the process, and supplementary Matlab codes. **YOU CANNOT USE ANY SENIOR DESIGN PROJECT (PAST OR CURRENT) AS PART OF YOUR PROJECT.**

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<tr>
<th>Task/Assignments</th>
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<tbody>
<tr>
<td><strong>Getting Started (several modules)</strong></td>
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<tr>
<td>Installation</td>
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<td>Building a Flowsheet</td>
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<td>Data Input</td>
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<td>Running a Simulation</td>
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<td><strong>Workshops</strong></td>
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<tr>
<td>Simulation of an Air Compressor</td>
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<td>Flash Separation</td>
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<td>Introduction to Simulation with RadFrac</td>
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<td>Design Specifications and Sizing</td>
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<td>Heat Exchange Simulation</td>
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<td>Production of Cyclohexane</td>
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<td>Simulating a Distillation Column for Crude Oil</td>
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<td>Simulating a Stripper for Waste Water Treatment</td>
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<td><strong>Basic and Advanced Aspen Concepts</strong></td>
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<td>Stream Purge</td>
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<td>Solids Handling</td>
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<td>Design Spec</td>
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<td>Sensitivity Analysis</td>
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<td>Optimization</td>
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<tr>
<td>Rate-controlled Kinetics (CSTR and PFR Design)</td>
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<td>Hierarchical Blocks</td>
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<td>Merging Flowsheets</td>
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<td>Case Study Tool</td>
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University Rules and Procedures

Disability statement (See Student Handbook):
Students with disabilities, including learning disabilities, who wish to request accommodations in class should register with the Services for Students with Disabilities (SSD) early in the semester so that appropriate arrangements may be made. In accordance with federal laws, a student requesting special accommodations must provide documentation of their disability to the SSD coordinator.

Academic misconduct (See Student Handbook):
You are expected to practice academic honesty in every aspect of this course and all other courses. Make sure you are familiar with your Student Handbook, especially the section on academic misconduct. Students who engage in academic misconduct are subject to university disciplinary procedures. Calculators are limited to basic scientific and graphing functions for exams and quizzes (those with USB or other data exchange port are prohibited).

Forms of academic dishonesty:
1. Cheating: deception in which a student misrepresents that he/she has mastered information on an academic exercise that he/she has not mastered; giving or receiving aid unauthorized by the instructor on assignments or examinations.

2. Academic misconduct: tampering with grades or taking part in obtaining or distributing any part of a scheduled test.

3. Fabrication: use of invented information or falsified research.

4. Plagiarism: unacknowledged quotation and/or paraphrase of someone else’s words, ideas, or data as one’s own in work submitted for credit. Failure to identify information or essays from the Internet and submitting them as one’s own work also constitutes plagiarism.

5. Use or possession of textbook solution manual. Since these are restricted by the copyright holder to teaching faculty only who are then prohibited from sharing with students, there is no legitimate way for a student to have a copy of the solution manual.

Nonacademic misconduct (See Student Handbook):
The university respects the rights of instructors to teach and students to learn. Maintenance of these rights requires campus conditions that do not impede their exercise. Campus behavior that interferes with either (1) the instructor’s ability to conduct the class, (2) the inability of other students to profit from the instructional program, or (3) campus behavior that interferes with the rights of others will not be tolerated. An individual engaging in such disruptive behavior may be subject to disciplinary action. Such incidents will be adjudicated by the Dean of Students under nonacademic procedures.

Sexual misconduct (See Student Handbook):
Sexual harassment of students and employers at Prairie View A&M University is unacceptable and will not be tolerated. Any member of the university community violating this policy will be subject to disciplinary action.

Attendance Policy:
Prairie View A&M University requires regular class attendance. Excessive absences will result in lowered grades. Excessive absenteeism, whether excused or unexcused, may result in a student’s
course grade being reduced or in assignment of a grade of “F”. Absences are accumulated beginning with the first day of class.

Student Academic Appeals Process
Authority and responsibility for assigning grades to students rests with the faculty. However, in those instances where students believe that miscommunication, errors, or unfairness of any kind may have adversely affected the instructor's assessment of their academic performance, the student has a right to appeal by the procedure listed in the Undergraduate Catalog and by doing so within thirty days of receiving the grade or experiencing any other problematic academic event that prompted the complaint.