CM3450 L01: Computer Aided Problem Solving  (Fall 2016)

Instructors: Dr. Wen Zhou, 202F CSE (Bldg. 19), 487-1164, wzhou1@mtu.edu

Class Schedule:       MWF 12:05 – 1:55, Room 202, ME-EM (Bldg. 20)

Office hours:  By Appointment

Prerequisites:  CM2110(C), MA2160

Text:  NO Textbook

Course webpage: Canvas

Catalog Description:
The use of modern software packages in chemical engineering. Packages include spreadsheet, symbolic manipulator, chemical process calculator, statistical and modeling software. Course develops knowledge and skills in using computer tools that will complement chemical engineering courses and practice.

Objectives:
- Mastery of basic problem setup for computer solutions.
- Familiarity with software: Matlab, Excel, UniSim, and Mathcad.
- Familiarity with solution of equations, optimization problems, differential equations, and process simulation.

Course Outline

I. Matlab  week 1-6
   a. Basics
   b. Solving linear/nonlinear equation(s)
   c. Unconstrained/constrained optimization
   d. Ordinary/partial differential equation(s)

II. UniSim  week 7-11
   a. Basis Environment
   b. Simulation Environment
   c. Unit Operations (Reactors, Phase Separators, Staged Columns, others)
   d. Interfacing with Microsoft Excel

III. Excel  week 11-12
   a. Use of SOLVER
   b. VBA programming

IV. Mathcad  week 13-14
   a. Basics and symbolic manipulations
   b. Solving equations and curve fitting
Course Policies and Procedures

Attendance
Attendance is required. Letters or emails need to be submitted formally to request for excused absences, and it should include: date, reason, documentation and plan for makeup. Valid reasons include: sickness, job interviews, athletic, university or military obligations.

Assignment
Assignments need to be done individually. Discussions are allowed but the work cannot be copied (revising another student’s document is not allowed). Neatness and logical development of work is a high priority and points will be deducted for sloppy or unreadable work.

Late submission
Points will be deducted per day for late submissions of homework assignments. Submissions that are one week late or more will not be accepted.

Examinations
There will be NO exams.

Collaboration/Plagiarism Rules: Cell phones, laptops and other electronic devices are not to be used in classes. All work needs to be done individually. File exchanges involving required drills and assignments between students are not allowed, and will be considered as violation of the Academic Integrity Code of Michigan Tech.

Course Grade Policy
The weighting of grades will be as follows:

<table>
<thead>
<tr>
<th>Subject</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Matlab</td>
<td>40%</td>
</tr>
<tr>
<td>UniSim</td>
<td>36%</td>
</tr>
<tr>
<td>Excel</td>
<td>12%</td>
</tr>
<tr>
<td>Mathcad</td>
<td>12%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
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</tbody>
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Letter Grades will be assigned following this schedule:

<table>
<thead>
<tr>
<th>Percentage Range</th>
<th>Grade</th>
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<tbody>
<tr>
<td>92-100%</td>
<td>A</td>
</tr>
<tr>
<td>85-91.99%</td>
<td>AB</td>
</tr>
<tr>
<td>80-84.99%</td>
<td>B</td>
</tr>
<tr>
<td>75-79.99%</td>
<td>BC</td>
</tr>
<tr>
<td>70-74.99%</td>
<td>C</td>
</tr>
<tr>
<td>65-69.99%</td>
<td>CD</td>
</tr>
<tr>
<td>60-64.99%</td>
<td>D</td>
</tr>
<tr>
<td>&lt;60%</td>
<td>F</td>
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</tbody>
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University Policies:
Student work products (exams, essays, projects, etc.) may be used for purposes of university, program, or course assessment. All work used for assessment purposes will not include any individual student identification. Academic Integrity, Americans with Disability Act, and Equal Opportunity are as follows:
http://www.mtu.edu/provost/faculty-resources/syllabus-policies/