Department of Mechanical Engineering

MCE 503/403 Modeling and Simulation of Mechatronic Systems

Instructor: Hanz Richter, Assistant Professor.
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Office Hours: Tuesday and Thursday, 10:00-12:00

Text: System Dynamics by Karnopp, Margolis and Rosenberg, (4th or 3rd ed.), Wiley

Objectives Introduce students to modern approaches to modeling and simulation of engineering dynamic systems. Provide skills enabling students to carry the modeling-simulation-model validation cycle required in mechatronic system design. Introduce students to automated modeling through the use of bond graph-based software for automatic equation generation. Upon completion of this course, students should be able to:

1. Identify the most appropriate route to model generation.
2. Construct dynamic models of electrical, mechanical and mixed models
3. Perform computer simulations for model validation.
4. Use a validated model as a tool for design.

Grading There will be homework assignments, a term exam and a final project. The relative weights for arriving to the final numerical grade are given below:

\[ GR = 0.4H + 0.35E + 0.25P \]

where \( H \) is the average of the homework grades excluding the lowest one, \( E \) is the exam and \( P \) is the project. Cutoff numerical grades for conversion to letter grades will be as follows:

<table>
<thead>
<tr>
<th>Range</th>
<th>Letter</th>
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<tbody>
<tr>
<td>88 – 100</td>
<td>A</td>
</tr>
<tr>
<td>75 – 87</td>
<td>B</td>
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<tr>
<td>65 – 74</td>
<td>C</td>
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<tr>
<td>50 – 64</td>
<td>D</td>
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<tr>
<td>0 – 49</td>
<td>F</td>
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Late homework will be rejected and receive a grade of zero. The project will be composed of a laboratory activity grade and a report grade. Make-up examinations will be arranged only due to extenuating circumstances, after proper justification is submitted.

Course website
http://academic.csuohio.edu/richter_h/courses/mce503
Class notes, announcements, homework and exam solutions will be posted. The site will also contain interesting links and Matlab program downloads.

Academic Integrity Academic dishonesty will not be tolerated and will be handled according to University policy: http://www.csuohio.edu/studentlife/conduct/acadregs.html