<table>
<thead>
<tr>
<th><strong>DEPARTMENT:</strong></th>
<th>MECHANICAL ENGINEERING</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>COURSE #:</strong></td>
<td>EML 3017C, 4 credits</td>
</tr>
<tr>
<td></td>
<td><a href="http://www.eng.fsu.edu/~hollis/eml3017c-f00/eml3017c_web/index.htm">http://www.eng.fsu.edu/~hollis/eml3017c-f00/eml3017c_web/index.htm</a></td>
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<tr>
<td><strong>COURSE TITLE:</strong></td>
<td>Mechanical Systems I</td>
</tr>
<tr>
<td><strong>TYPE COURSE:</strong></td>
<td>Required</td>
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<tr>
<td><strong>TERMS OFFERED:</strong></td>
<td>Fall</td>
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<tr>
<td><strong>CATALOG DESCRIPTION:</strong></td>
<td>This is the first course in a sequence of two courses intended to provide the essential tools for the design and analysis of mechanical systems. Emphasis is on linkages; constraints and degrees of freedom; position, velocity, and acceleration analysis; cams, gears and gear trains, static and dynamic analysis; computer simulations and models of components and systems; team class projects involving dissection of existing machines, and design and manufacture of new mechanical systems.</td>
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<tr>
<td><strong>PREREQUISITES:</strong></td>
<td>EML3011C, Mechanics and Materials I; EML3013C, Dynamical Systems I; MAP3305, Engineering Math I</td>
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<tr>
<td><strong>AREA COORDINATOR:</strong></td>
<td>Dr. Patrick Hollis</td>
</tr>
<tr>
<td><strong>RESPONSIBLE FACULTY:</strong></td>
<td>Dr. Patrick Hollis</td>
</tr>
<tr>
<td><strong>INSTRUCTOR OF RECORD:</strong></td>
<td>Dr. Patrick Hollis</td>
</tr>
<tr>
<td><strong>DATE OF PREPARATION:</strong></td>
<td>6/1/01 (Holllis)</td>
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<tr>
<td><strong>CLASS SCHEDULE:</strong></td>
<td>Three times weekly for 50 min.</td>
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<tr>
<td><strong>LABORATORY SCHEDULE:</strong></td>
<td>Once weekly for 3 hrs</td>
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<tr>
<td><strong>SCIENCE/DESIGN (%):</strong></td>
<td>85 / 15</td>
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<tr>
<td><strong>CONTRIBUTION TO MEETING THE PROFESSIONAL COMPONENT:</strong></td>
<td>85% engineering science 15% engineering design of mechanical systems, components</td>
</tr>
<tr>
<td><strong>ASSESSMENT TOOLS:</strong></td>
<td>1. Weekly homework problems 2. Weekly lab group assignments 3. Group project reports 4. Two midterm tests and one final examination</td>
</tr>
<tr>
<td><strong>COURSE OBJECTIVES</strong></td>
<td>(Numbers shown in brackets are links to program outcomes)</td>
</tr>
</tbody>
</table>
1. To explain and demonstrate the constraints and degrees of freedom in a linkage [1]
2. To show how to find analytically and computationally the position, velocity, and acceleration in various linkages [1, 5]
3. To show how to analyze and design compound and planetary gear trains [1, 3, 5, 7, 10]
4. To show how to design cam linkages for specified motion requirements [1, 3, 5, 7, 10]
5. To provide tools to design linkages to meet simple motion requirements [1, 3, 5, 7, 10]
6. To introduce computational tools for the simulation and design of linkages [3, 5, 7, 10]

<table>
<thead>
<tr>
<th>COURSE OUTCOMES*</th>
<th>(Numbers shown in brackets are links to course objectives listed above)</th>
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<tbody>
<tr>
<td>1.</td>
<td>Determine the number of degrees of freedom in a mechanism [1]</td>
</tr>
<tr>
<td>2.</td>
<td>Perform position, velocity, acceleration, and force analysis of simple linkages [2]</td>
</tr>
<tr>
<td>3.</td>
<td>Synthesize simple gear trains to achieve specified speed ratios [3]</td>
</tr>
<tr>
<td>4.</td>
<td>Synthesize simple mechanisms to meet given performance characteristics [1, 2, 3, 4, 5, 6]</td>
</tr>
<tr>
<td>5.</td>
<td>Generate computer models of mechanisms to perform dynamic simulations [2, 6]</td>
</tr>
<tr>
<td>7.</td>
<td>Design and analyze simple cams to meet specified performance [4]</td>
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