PELLISSIPPI STATE COMMUNITY COLLEGE
MASTER SYLLABUS

PARAMETRIC MODELING W/LAB
MET 2240

Class Hours: 3.0 Credit Hours: 4.0
Laboratory Hours: 1.0 Revised: Fall 2015

Catalog Course Description:

An advanced course using SolidWorks, a parametric modeling and solid modeling software. Students create advanced parametric, feature-based, three dimensional solid models. This covers assemblies and detailing engineering drawings.

Entry Level Standards:

Students entering this course should have mastered the basic principles of good drafting including orthographic projections, sectional views, auxiliary views and dimensioning.

Prerequisites:

MET 1100 or consent of program coordinator

Textbook(s) and Other Course Materials:


I. Week/Unit/Topic Basis:

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
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<tbody>
<tr>
<td>1</td>
<td>3D Sketch</td>
</tr>
<tr>
<td>2</td>
<td>Planes Creation</td>
</tr>
<tr>
<td>3</td>
<td>Advanced Modeling - Sweep with Composite Curve</td>
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<tr>
<td>4</td>
<td>Advanced Modeling - Sweep vs. Loft</td>
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<tr>
<td>5</td>
<td>Lofts and Loft with Guide Curves</td>
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<tr>
<td>6</td>
<td>Surfaces - Lofted Surfaces</td>
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<tr>
<td>7</td>
<td>Advanced Surfaces - Surface Offset / Ruled</td>
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<tr>
<td>8</td>
<td>Surfaces vs. Solid Modeling</td>
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<tr>
<td>9</td>
<td>SimulationXpress</td>
</tr>
<tr>
<td>10</td>
<td>Sheet Metal</td>
</tr>
</tbody>
</table>
II. Engineering Technology General Outcomes (Educational objectives)

I. Apply basic engineering theories and concepts creatively to analyze and solve technical problems

II. Utilize with a high degree of knowledge and skill equipment, instruments, software, and technical reference materials currently used in industry.

III. Communicate effectively using developed writing, speaking, and graphics skills.

IV. Assimilate and practice the concepts and principles of working in a team environment.

V. Obtain employment within the discipline or matriculate to a four year program in engineering or industrial technology

III. Engineering Technology Concentration Competencies*

Students will:

A. Apply the knowledge, techniques, skills, and modern tools for the concentration of study to specifically defined engineering technology activities

B. Demonstrate the knowledge of mathematics, science, engineering and technology to engineering technology problems using developed practical knowledge

C. Conduct and report the results of standard tests and measurements, and conduct, analyze and interpret experiment or project results

D. Function effectively as a member of a technical team

E. Identify, analyze and solve specifically defined engineering technology-based problems

F. Employ written, oral and visual communication in a technical environment

* At the program level all 6 competencies apply to roman numerals I – V of the Engineering Technology General Outcomes (Educational objectives) listed above.

IV. Course Goals*:

The course will

1. Increase the ability to sketch advanced 3D mechanical drawings. (A,B,E,F)

2. Foster the ability to construct advanced geometry using software commands. (A,B,E,F)

3. Increase the ability to use parametric, feature-based modeling system to define 3D models. (A,B,E,F)
4. Build the skills to create advanced surfaces. (A,B,E,F)
5. Foster the ability to perform stress analysis. (A,B,E,F)
6. Expand the student’s understanding of sheet metal parts and applications. (A,B,E,F)

*Capital letters after course goals reference the competencies of the Engineering Technology concentrations listed above.

V. Expected Student Learning Outcomes*:

Students will be able to:

a. Redefine the universal coordinate system. 1
b. Utilize the 3D Sketcher to create 2D surfaces. 1
c. Place advanced relations between elements. 1
d. Create equations to define dimensions. 1
e. Create 3D parametric, feature-based mechanical parts. 3
f. Create sweep features. 2
g. Create advanced plans. 2
h. Design conical, ground-end, closed-end springs. 2
i. Create a loft feature. 3
j. Create a sweep feature. 3
k. Delete, suppress, resume, reorder, modify, and redefine features. 2,3
l. Add and extrude text features. 3
m. Insert a planar surface from a sketch that lie on a plane. 4
n. Extrude, revolve, sweep, or loft a surface from the sketcher. 4
o. Offset a surface from an existing face or surface. 4
p. Apply restraints and loads. 5
q. Analyze the part for displacements, strains, and stresses. 5
r. Create a sheet metal part in the folded stage. 6
s. Create housing or enclosures for parts. 6
t. Convert sheet metal files from IGES to SolidWorks. 6

*Numbers after Expected Student Learning Outcomes reference the course goals listed above.

VI. Evaluation:
A. Testing Procedures:

Formal tests and quizzes will be given at the discretion of the instructor.

B. Laboratory Expectations: 75% of grade

Students will be evaluated on the correctness of their drawings.

C. Field Work: 25% of grade

Students will be graded on a final set of working drawings of a project that includes three-dimensional solid model and all orthographic drawings as required to sufficiently describe the part/parts for manufacturing.

D. Other Evaluation Methods:

n/a

E. Grading Scale:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>90-100%</td>
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<tr>
<td>B+</td>
<td>85-89%</td>
</tr>
<tr>
<td>B</td>
<td>80-84%</td>
</tr>
<tr>
<td>C+</td>
<td>75-79%</td>
</tr>
<tr>
<td>C</td>
<td>70-74%</td>
</tr>
<tr>
<td>D</td>
<td>60-69%</td>
</tr>
<tr>
<td>F</td>
<td>59% and below</td>
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VII. Policies:

A. Attendance Policy:

Pellissippi State expects students to attend all scheduled instructional activities. As a minimum, students in all courses (excluding distance learning courses) must be present for at least 75 percent of their scheduled class and laboratory meetings in order to receive credit for the course. Individual departments/programs/disciplines, with the approval of the vice president of Academic Affairs, may have requirements that are more stringent. In very specific circumstances, an appeal of the policy may be addressed to the head of the department in which the course was taken. If further action is warranted, the appeal may be addressed to the vice president of Academic Affairs.

B. Academic Dishonesty:

Academic misconduct committed either directly or indirectly by an individual or group is subject to disciplinary action. Prohibited activities include but are not limited to the following practices:

• Cheating, including but not limited to unauthorized assistance from material, people, or devices when taking a test, quiz, or examination; writing papers or reports; solving problems; or completing academic assignments.

• Plagiarism, including but not limited to paraphrasing, summarizing, or directly quoting published or unpublished work of another person, including online or computerized services, without proper documentation of the original source.

• Purchasing or otherwise obtaining prewritten essays, research papers, or materials prepared by another person or agency that sells term papers or other academic materials to be presented as one’s own work.

• Taking an exam for another student.
• Providing others with information and/or answers regarding exams, quizzes, homework or other classroom assignments unless explicitly authorized by the instructor.
• Any of the above occurring within the Web or distance learning environment.

Please see the Pellissippi State Policies and Procedures Manual, Policy 04:02:00 Academic/Classroom Conduct and Disciplinary Sanctions for the complete policy.

Note: It is expected and desirable that CID students assist other students. However, students may only submit work completed by themselves.

C. Accommodations for disabilities:

Students that need accommodations because of a disability, have emergency medical information to share, or need special arrangements in case the building must be evacuated should inform the instructor immediately, privately after class or in her or his office. Students must present a current accommodation plan from a staff member in Disability Services (DS) in order to receive accommodations in this course. Disability Services may be contacted by sending email to disabilityservices@pstcc.edu, or by visiting Alexander 130. More information is available at http://www.pstcc.edu/sswd/.

D. Other Policies:

**Safety and Equipment Abuse:**
Repeated safety violations will result in a reduction of final grade, at the instructor's discretion. Flagrant violations which result in equipment damage or personal injury could result in automatic failure of the course