MECH 102 – PARAMETRIC MODELING

CIP Code: 15.0805
For assistance determining CIP Code, please refer to this webpage https://nces.ed.gov/ipeds/cipcode/browse.aspx?y=55 or reach out to Sarah Todd at todds@canton.edu

Created by: Cullen Haskins
Updated by: N/A
A. TITLE: PARAMETRIC MODELING

B. COURSE NUMBER: MECH 102

C. CREDIT HOURS (Hours of Lecture, Laboratory, Recitation, Tutorial, Activity):

# Credit Hours: 2
# Lecture Hours ___ per Week
# Lab Hours ___ Week (2x at 2 hours each)
Other ___ per Week

Course Length (# of Weeks): 15

D. WRITING INTENSIVE COURSE: No

E. GER CATEGORY:
Does course satisfy more than one GER category? If so, which one?

F. SEMESTER(S) OFFERED: (Spring)

G. COURSE DESCRIPTION:
This course is an introduction to parametric design. The course covers parametric modeling fundamentals, solid geometry concepts, fundamentals of parametric constraints, geometric construction tools, use of symmetrical features, advanced 3D construction tools, sheet metal tools, and basic assembly modeling. Software implementation of the skills learned in MECH 101 and the creation of industry-accepted drawing sets are covered as well.

H. PRE-REQUISITES: MECH 101 (Drawing for Engineers)
CO-REQUISITES: none

I. STUDENT LEARNING OUTCOMES:

<table>
<thead>
<tr>
<th>Course Student Learning Outcome [SLO]</th>
<th>PSLO</th>
<th>GER</th>
<th>ISLO</th>
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<tbody>
<tr>
<td>a. Communicate engineering ideas clearly and easily with parametric modeling software</td>
<td>(ABET – 3)</td>
<td>1, W</td>
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<td>b. Create accurate parametric models based on drawings and physical objects or parts</td>
<td>(ABET – 1)</td>
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<td>c. Employ industry-accepted drawing and dimensioning practice with parametric software tools</td>
<td>(ABET – 1)</td>
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<td>d. Correctly locate and orient orthogonal, section, and auxiliary views on drawing sheets using parametric</td>
<td>(ABET – 1)</td>
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<tr>
<td>KEY</td>
<td>Institutional Student Learning Outcomes [ISLO 1 – 5]</td>
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<tr>
<td>ISLO #</td>
<td>ISLO &amp; Subsets</td>
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| 1 | Communication Skills  
Oral [O], Written [W] |
| 2 | Critical Thinking  
Critical Analysis [CA], Inquiry & Analysis [IA], Problem Solving [PS] |
| 3 | Foundational Skills  
Information Management [IM], Quantitative Lit./Reasoning [QTR] |
| 4 | Social Responsibility  
Ethical Reasoning [ER], Global Learning [GL], Intercultural Knowledge [IK], Teamwork [T] |
| 5 | Industry, Professional, Discipline Specific Knowledge and Skills |

J. **APPLIED LEARNING COMPONENT:** Yes___X___ No_______

If Yes, select one or more of the following categories:

- Classroom/Lab_X_
- Internship___
- Clinical Practicum___
- Practicum___
- Service Learning___
- Community Service___
- Civic Engagement___
- Creative Works/Senior Project___
- Research___
- Entrepreneurship___

(program, class, project)

L. REFERENCES: N/A

M. EQUIPMENT: Computer lab

N. GRADING METHOD: A-F

O. SUGGESTED MEASUREMENT CRITERIA/METHODS:
   Homework/Labs
   Quizzes
   Exams

P. DETAILED COURSE OUTLINE:
   See Lab Outline

Q. LABORATORY OUTLINE:

1. Week 1
   a. Getting Started
   b. Parametric Modeling Fundamentals
2. Week 2
   a. Constructive Solid Geometry Concepts
3. Week 3
   a. Model History Tree
4. Week 4
   a. Parametric Constraint Fundamentals
5. Week 5
   a. Geometric Construction Tools
6. Week 6
   a. Parent/Child Relationships and the BORN Technique
7. Week 7
   a. Review
   b. Exam 1
8. Week 8
   a. Part Drawings and 3D Model-Based Definition
9. Week 9
   a. Datum Features and Auxiliary Views
10. Week 10
    a. Symmetric Features in Designs
11. Week 11
    a. Advanced 3D Construction Tools
12. Week 12
    a. Sheet Metal Designs
13. Week 13
    a. Assembly Modeling – Putting It All Together
14. Week 14
    a. Assembly Modeling – Putting It All Together
    b. Review
15. Exam 2