CURRICULUM COMMITTEE CHECKLIST

NAME OF PROGRAM: Engineering Foundation Date: 4/6/12

Step 1  Reviewed change at division meeting.  
YES  NO

Step 2  Presented as informational item at Division Chair Meeting(s) and checked if it affects other departments. Like programs must meet with Division Chairs on all affected campuses (North Mankato and Faribault).

Division Chair’s signature

Step 3  Instructional Dean reviewed and indicated need for Curriculum Committee approval.

Instructional Dean’s signature

Step 4  Advisory Committee approval indicated in meeting minutes if necessary. Minutes provided to Curriculum Committee.

Step 5  Curriculum Committee made recommendations (changes, additional approvals, etc.). If no, skip to Step 7.

Step 6  Committee’s recommendations completed. (Skip if not applicable.)

Step 7  Curriculum Committee approved.

Curriculum Committee Chair’s signature

Step 8  Minutes and necessary materials provided to VP of Academic Affairs.

Step 9  Vice President of Academic Affairs approved.

Vice President of Academic Affairs’ signature

Step 10 New Course Maximum Enrollment to Shared Governance.

Step 11 President’s approval for all changes requiring MnSCU approval.

President’s signature
## Appendix B

### New Course or Course Change Proposal Form

**Date of Proposal:** 4/6/12  
**Author:** Jay Stencel

**Proposed Type:**  
- [X] New Course  
- [ ] Modify Course  
- [ ] Delete Course

**Contact for the Course:** Jay Stencel, 389-7356

**Course Designation, Number and Title** (i.e.: ACCT 1800, Business Law):  
ENGR 1210 Introduction to Problem Solving and Design

**Number of Credits:** 2

**Prerequisites:** ENGR 1110

**Course Description:** This course introduces students to engineering design concepts and provides students with opportunities to improve their technical written and oral communication skills. The course also introduces the students to problem solving skills including programming logic through the use of Microsoft Excel spreadsheets and Power Point. This course will cover standard ABET professional outcomes a, and f through k. Prerequisite: ENGR 1110.

<table>
<thead>
<tr>
<th>Grading Method</th>
<th>Grade</th>
<th>Pass/Fail</th>
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<tbody>
<tr>
<td>Scheduling:</td>
<td>Fall</td>
<td>Spring</td>
</tr>
<tr>
<td>Instructional Type:</td>
<td>Lecture</td>
<td>Lab</td>
</tr>
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</table>

*Class Maximum: (For New Courses Only) / All Unlimited faculty members of a program or discipline must sign.*

<table>
<thead>
<tr>
<th>Faculty Name</th>
<th>Faculty Signature</th>
<th>Class Max</th>
<th>Date</th>
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</thead>
<tbody>
<tr>
<td>Jay Stencel</td>
<td></td>
<td>24</td>
<td></td>
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**Dean's Name**  
**Suzanne Nordblom**

If there is not enough space provided, please use the back of this form for additional signatures or click on a row with the right button of the mouse, select Insert and then select Insert rows below to add rows to the table.

Is this Course Proposed as a Liberal Arts Course:  
**Yes**  
**No**

If Yes, Which MnTC Area/Areas Will it Fulfill (http://www.mntransfer.org)?

Is This Course a Requirement/Elective for a Specific Program or Programs?  
**Yes**  
**No**

If Yes, Which Program(s)? Engineering Foundations

Describe What is Changing/Being Added, and the Rationale:
New course for engineering foundations program

What Impact Will This New Course or Change Have on Other Programs or Areas?  
**None**

➢ Attach Common Course Outline to this Form.
Introduction to Problem Solving and Design
Course Outcome Summary

Course Information
Organization: South Central College
Developers: Jay T. Stencel, P.E.
Course Number: ENGR 1210
Potential Hours of Instruction: 48
Total Credits: 2

Description
This course introduces students to engineering design concepts and provides students with opportunities to improve their technical written and oral communication skills. The course also introduces the students to problem solving skills including programming logic through the use of Microsoft Excel spreadsheets and Power Point. This course will cover standard ABET professional outcomes a, and f through k. Prerequisite: ENGR 1110.

Types of Instruction

<table>
<thead>
<tr>
<th>Instruction Type</th>
<th>Contact Hours</th>
<th>Credits</th>
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</thead>
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<tr>
<td>Lecture</td>
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<td>1</td>
</tr>
<tr>
<td>Lab</td>
<td>32</td>
<td>1</td>
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</table>

Prerequisites
ENGR 1110

Exit Learning Outcomes

Core Abilities
A. Written and Oral Communication
B. Critical and Creative Thinking
C. Ethical Reasoning and Action
D. Teamwork and Problem-Solving

Competencies
1. Utilize electronic spreadsheets to develop programming logic and solve problems
   Learning Objectives
   a. Demonstrate knowledge of programming in Excel
   b. Construct equations and links for problem solving
   c. Create graphical representations of calculated data
   d. Develop tabular representations of calculated data
2. Apply knowledge of mathematics, science, and engineering to problem solving
   Learning Objectives
   a. Explore ways of solving problems mathematically
   b. Formulate problem solving methods
3. **Apply principles of economics to engineering projects**
   **Learning Objectives**
   a. Create cash flow diagrams
   b. Calculate simple and compound interest
   c. Calculate future worth of a present value
   d. Calculate loan monthly payments

4. **Demonstrate an understanding of time budgeting and time management**
   **Learning Objectives**
   a. Explore the project activities
   b. Develop a project activities network
   c. Estimate activity completion time
   d. Create a Critical Path Management Schedule

5. **Summarize engineering communication and presentation skills**
   **Learning Objectives**
   a. Identification of steps to solve engineering problems
   b. Explore solutions to engineering problems
   c. Examine various methods of communication for engineers
   d. Present problem solutions orally and visually
   e. Develop presentations utilizing Power Point

6. **Demonstrate an understanding of engineering and professional ethics**
   **Learning Objectives**
   a. Describe the code of ethics for engineers
   b. Summarize the engineer's professional obligations
   c. Examine activities of the professional engineer license-granting agency

7. **Identify the need for and engage in life-long learning**
   **Learning Objectives**
   a. Explore the benefits of continued learning
   b. Summarize methods to increase learning ability
   c. Demonstrate an understanding of the advantages of ongoing, active learning

8. **Demonstrate an understanding of engineering graphical communications**
   **Learning Objectives**
   a. Describe dimensioning and tolerancing
   b. Describe views
   c. Describe engineering symbols and meanings

9. **Demonstrate an understanding of engineering materials**
   **Learning Objectives**
   a. Describe various material properties
   b. Examine the phases of solids, liquids, gases, and plasma
   c. Summarize the composition of air
Appendix B

New Course or Course Change Proposal Form

Date of Proposal: 4/6/12

Author: Jay Stencel

Proposal Type: (*New Course) Modify Course Delete Course

Contact for the Course: Jay Stencel, 389-7356

Course Designator, Number and Title (i.e.: ACCT 1800, Business Law):
ENGR 1211 Engineering Drafting

Number of Credits: 2

Prerequisites: ENGR 1110

Course Description: This course covers the basic operations of both AutoCAD and Solidworks drafting software. Students will use both programs to make drawings of parts and plans related to the engineering field. This course will cover standard ABET professional outcomes g and k. Prerequisite: ENGR 1110.

Grading Method: Grade Pass/Fail

Scheduling: Fall Spring Summer Alternate Years Variable On Demand

Instructional Type: Lecture Lab Lecture/Lab Internship Seminar

*Class Maximum: (For New Courses Only) / All Unlimited faculty members of a program or discipline must sign.

Faculty Name: Jay Stencel
Faculty Signature

Class Max: 24
Date: 4/27/12

Dean's Name: Suzanne Nordblom
Dean's Signature

Date: 5/2/12

If there is not enough space provided, please use the back of this form for additional signatures or click on a row with the right button of the mouse, select insert and then select insert rows below to add rows to the table.

Is this Course Proposed as a Liberal Arts Course: Yes No

If Yes, Which MnTC Area/Areas Will it Fulfill (http://www.mntransfer.org)?

Is This Course a Requirement/Elective for a Specific Program or Programs: Yes No

If Yes, Which Program(s)? Engineering Foundations

Describe What is Changing/Being Added, and the Rationale:
New course for engineering foundations program

What Impact Will This New Course or Change Have on Other Programs or Areas?
None

➢ Attach Common Course Outline to this Form.
Engineering Drafting
Course Outcome Summary

Course Information
Organization: South Central College
Developers: Jay T. Stencel, P.E.
Course Number: ENGR 1211
Potential Hours of Instruction: 64
Total Credits: 2

Description
This course covers the basic operations of both AutoCAD and Solidworks drafting software. Students will use both programs to make drawings of parts and plans related to the engineering field. This course will cover standard ABET professional outcomes g and k. Prerequisite: ENGR 1110.

Types of Instruction

<table>
<thead>
<tr>
<th>Instruction Type</th>
<th>Contact Hours</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab</td>
<td>64</td>
<td>2</td>
</tr>
</tbody>
</table>

Prerequisites
ENGR 1110

Exit Learning Outcomes
Core Abilities
A. Teamwork and problem-solving
B. Analysis and inquiry
C. Critical and creative thinking
D. Written and oral communication

Competencies
1. Create basic geometry in AutoCAD
   Learning Objectives
   a. Use help command
   b. Make lines and circles
   c. Use relative coordinates
   d. Use absolute coordinates
   e. Use polar coordinates
   f. Plot drawings to scale
   g. Use ZOOM/VIEW/Pan command
2. Utilize layers, colors, and linetypes
   Learning Objectives
   a. Use layers
b. Make layer settings  
c. Set layer line weights  
d. Edit corners  

3. **Create template drawings**  
   **Learning Objectives**  
a. Create templates  
b. Use rectangular ARRAY commands  
c. Change plot settings  
d. Make paper space viewports  

4. **Use arcs and polar arrays**  
   **Learning Objectives**  
a. Create polar arrays  
b. Draw arcs  
c. Use MIRROR command  
d. Use ROTATE command  

5. **Use object snap**  
   **Learning Objectives**  
a. Use OBJECT SNAP commands  
b. Make SNAP settings  
c. Use TRIM/STRETCH command  
d. Use BREAK command  
e. Use GRIPS  

6. **Create text, dimensions, and other complex entities**  
   **Learning Objectives**  
a. Make text/dimension styles  
b. Use MATCHPROP command  
c. Dimension geometry  
d. Use HATCH command  

7. **Utilize polylines**  
   **Learning Objectives**  
a. Make POLYLINES  
b. Edit Polylines  
c. Use the FILL command  
d. Draw SPLINES  

8. **Create blocks**  
   **Learning Objectives**  
a. Make blocks  
b. Create groups  
c. Edit attributes  

9. **Describe the Sketching Process in Solidworks**  
   **Learning Objectives**  
a. Explain basic sketching  
b. Use sketch entities  
c. Identify rules that govern sketches
d. Define sketch relations
e. Describe convert function
f. Describe dimensions
g. Explain sketch fillets
h. Explain cuts

10. **Explain Basic Part Modelign**
    **Learning Objectives**
    a. Define basic modeling
    b. Choose the sketch plane
    c. Use the hole wizard
    d. Describe cut feature
    e. Define filleting
    f. Explain detailing basics
    g. Identify center marks
    h. Describe model dimensions

11. **Explain Patternig**
    **Learning Objectives**
    a. Identify the use of patterns
    b. Use linear pattern
    c. Use circular patterns
    d. Use mirror patterns

12. **Explain Views**
    **Learning Objectives**
    a. Describe isometric view
    b. Describe front, top and side views
    c. Describe dynamic view

13. **Describe Revolved Features**
    **Learning Objectives**
    a. Describe revolved features
    b. Identify material and mass properties
    c. Define design intent
    d. Explain relations
    e. Make planes

14. **Analyze Shelling and Ribs**
    **Learning Objectives**
    a. Explain shelling and ribs
    b. Describe analyzing and adding draft
    c. Identify other options for draft
    d. Use full round fillets
    e. Define thin features
    f. Explain Splines
Appendix B

New Course or Course Change Proposal Form

Date of Proposal: 4/6/12

Author: Jay Stencel

Proposal Type: *New Course  Modify Course  Delete Course

Contact for the Course: Jay Stencel, 389-7356

Course Designator, Number and Title (i.e.: ACCT 1800, Business Law):
ENGR 1212 Engineering Design and Principles 2

Number of Credits: 1

Prerequisites: ENGR 1111

Course Description: This course is a continuation of ED&P1. It expands the knowledge, tools, and softwares of personal digital fabrication using the fabrication laboratory. It will explore the needs and methods for creating prototypes. This course will cover standard ABET professional outcome. Prerequisite: ENGR 1111

Grading Method: Grade Pass/Fail

Scheduling: Fall Spring Summer Alternate Years Variable On Demand

Instructional Type: Lecture Lab Lecture/Lab Internship Seminar

*Class Maximum: (For New Courses Only) / All Unlimited faculty members of a program or discipline must sign.

Faculty Name  Faculty Signature  Class Max  Date
Jay Stencel  4/27/12

Dean's Name  Dean's Signature  Date
Suzanne Nordblom  5/2/12

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Is this Course Proposed as a Liberal Arts Course: Yes  No

If Yes, Which MnTC Area/Areas Will it Fulfill (http://www.mntransfer.org)?

Is This Course a Requirement/Elective for a Specific Program or Programs? Yes  No

If Yes, Which Program(s)? Engineering Foundations

Describe What is Changing/Being Added, and the Rationale:
New course for engineering foundations program

What Impact Will This New Course or Change Have on Other Programs or Areas?
None

➢ Attach Common Course Outline to this Form.

Appendix C
Engineering Design and Principles 2
Course Outcome Summary

Course Information
Organization          South Central College
Developers            Jay T. Stencil, P.E.
Course Number         ENGR 1212
Potential Hours of    32
Instruction
Total Credits         1

Description
This course is a continuation of ED&P1. It expands the knowledge, tools, and softwares of personal
digital fabrication using the fabrication laboratory. It will explore the needs and methods for creating
prototypes. This course will cover standard ABET professional outcome c. Prerequisite: ENGR 1111
ED&P1.

Types of Instruction
Instruction Type       Contact Hours Credits
Lab                   32                 1

Prerequisites
ENGR 1111

Exit Learning Outcomes
Core Abilities
A. Teamwork and problem-solving
B. Analysis and inquiry
C. Critical and creative thinking
D. Written and oral communication

Competencies
1. Demonstrate the use of Fab Lab equipment
   Learning Objectives
   a. Demonstrate the use of the laser cutter
   b. Demonstrate the use of various basic shop tools
   c. Demonstrate acrylic fabrication
   d. Demonstrate various material joining methods
2. Utilize CorelDraw for the Laser Cutter
   Learning Objectives
   a. Understand drafting in the X, Y, and Z axis
   b. Draw basic line elements with Z thickness
   c. Post process drawings for cutting
3. Create a prototype
Learning Objectives
a. Research a given problem
b. Create a list of alternative solutions
c. Fabricate the selected alternative
d. Test and document results of the prototype
e. Trouble shoot and recreate prototype
f. Create R&D report

4. Create projects
   Learning Objectives
   a. Create a simple machine
   b. Create a final project
   c. Test projects
   d. Present projects to the class orally and in report form

5. Explain shop safety procedures
   Learning Objectives
   a. Demonstrate proper lab safety
   b. Summarize equipment safety
   c. Understand blood borne pathogens