

Course discipline/number/title: CAD 1120: Sheetmetal and Weldments

A. CATALOG DESCRIPTION

1. **Credits:** 2
2. **Hours/Week:** 1 lecture, 2 lab
3. **Prerequisites (Course discipline/number):** CAD 1039 or Instructor's permission
4. **Other requirements:** Students must receive a grade of C or better in all CAD courses.
5. **MnTC Goals (if any):** NA

B. COURSE DESCRIPTION: This course is designed to teach welding symbols and their applications as well as sheet metal design. SolidWorks skills are incorporated into making complete weldment drawings and sheet metal formed and flat layouts. Students will create and identify welding symbols and learn to apply them in SolidWorks drawings. Students will also calculate sheet metal bend allowance and apply those dimensions to flat layouts using SolidWorks. This course will be taught using the latest release of SolidWorks. Students must receive a grade of C or better in all CAD courses.

C. DATE LAST REVISED (Month, year): May, 2022

D. OUTLINE OF MAJOR CONTENT AREAS:

1. Sheet metal SolidWorks settings: bend allowance, bend deduction, K-Factor
2. Manually calculating sheet metal bend allowance, and bend deduction
3. Sheet metal drawings with flat layouts with ordinate dimensioning
4. Sheet metal flat layouts exported to CO2 laser
5. Welding process - overview
6. Bills of materials and weldments
7. Welding joints
8. Welding symbols
9. Types of weld symbols
 - a) Fillet weld
 - b) Groove weld
 - c) Back or backing weld
 - d) Plug and slot weld
 - e) Surface weld
 - f) Edge weld
 - g) Spot weld
 - h) Resistance welds
10. Work with RCTC welding students for project documentation

E. LEARNING OUTCOMES (GENERAL): The student will be able to:

1. Apply sheet metal bend allowance and layouts within SolidWorks and sketching.
2. Understand SolidWorks settings for bend allowance, bend deduction, K-Factor.
3. Control default settings for sheet metal in SolidWorks.
4. Create "hands on" sheet metal prototypes using CO2 laser and acrylic bender.
5. Demonstrate correct use of weld symbols using SolidWorks.
6. Create weldment drawings using SolidWorks.
7. Dimension weldment drawings using SolidWorks.
8. Create welding symbol library.
9. Observe industrial weldment drawings.
10. Identify weld symbols.
11. Create detail drawings for RCTC Welding program student projects.
12. Students will have the opportunity to take the SolidWorks certified tests for Sheetmetal and Weldments.

F. LEARNING OUTCOMES (MNTC): NA

- G. METHODS FOR EVALUATION OF STUDENT LEARNING:** Methods may include but are not limited to:
1. Tests
 2. Quizzes
 3. Drawings
 4. Project notebooks
 5. Oral Presentations
- H. RCTC CORE OUTCOME(S).** This course contributes to meeting the RCTC Core Outcome(s):
Critical Thinking. Students will think systematically and explore information thoroughly before accepting or formulating a position or conclusion.
- I. SPECIAL INFORMATION (if any):**
Tuition differential