Mechanical Drafting and Design

Career Cluster	Manufacturing
Course Code	21106
Prerequisite(s)	Introduction to Drafting and Design course 21102
Credit	1
Program of Study and Sequence	Introduction of Drafting and Design – **Mechanical Drafting and Design** – Capstone Experience
Student Organization	Skills USA
Coordinating Work-Based Learning	Field trips, youth internships
Industry Certifications	ADDA Mechanical Apprentice certification
Teacher Certification	7-12 Technology Education; STEM Cluster Endorsement; Engineering & Robotics Pathway Endorsement; Drafting; Manufacturing Cluster Endorsement; Welding & Precision Machining Pathway Endorsement
Resources	

Course Description:

People with careers in design and pre-construction create our future. They turn a concept into a set of plans whether it's a component, a system, or a building. Their plans guide other construction or manufacturing professionals as they continue the building process. Mechanical Drafting and Design will expose students to the American Design Drafting Association (ADDA) Apprentice standards in mechanical drafting and then the students will be given the option to take the ADDA Apprentice drafting test.

Program of Study Application

This is the second pathway course in the Manufacturing cluster, Design and Engineering pathway. Introduction to Drafting and Design Course number 21102 is a prerequisite for this course. The course would be followed by a capstone experience.

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Course Standards

MDD 1 Demonstrate the use of geometric construction

Webb Level	*Sub-indicator*	*Integrated Content*
Two Skill/Concept	MDD 1.1 Apply geometric design and descriptive geometry to the design process. • Demonstrate accuracy when producing a geometric drawing • Draw elements that are accurate and to scale • Use geometric construction techniques	ADDA Apprentice Mechanical #6
Three Strategic Thinking	MDD 1.2 Demonstrate basic geometric dimensioning and tolerancing (GD&T). • Geometric symbols and terms related to geometric dimension and tolerancing (GD&T) • Describe the normal size, tolerance, limits, and allowance of two mating parts • Dimension two mating parts using limit dimension, unilateral tolerances and bilateral tolerances • Draw and place feature control symbols and datum references on a drawing	ADDA Apprentice Drafting Competency Mechanical #12

Notes:

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MDD 2: Prepare mechanical drawings.

Webb Level	*Sub-indicator*	*Integrated Content*
3 -strategic thinking	MDD 2.1 Create a multi-view drawing. • Draw an orthographic projection with proper top, front and side views • Properly align views	ADDA Apprentice Drafting Competency Mechanical #7
Three Strategic Thinking	MDD 2.2 Create sectional views of a mechanical drawing. • Complete a technical drawing using standard sectional views such as full, half, offset, broken-out, removed, & revolved	ADDA Apprentice Drafting Competency Mechanical #8
Three Strategic Thinking	MDD 2.3 Develop auxiliary views of mechanical drawings. • Create a primary auxiliary view from any orthographic projection • Draw folding lines or reference plane lines between any two adjacent views • Construct depth, height, or width auxiliary views • Construct partial auxiliary views • Create auxiliary sectional views • Find true lengths of an oblique line by constructing an auxiliary view • Create secondary auxiliary views	ADDA Apprentice Drafting Competency Mechanical #9
Three Strategic Thinking	MDD 2.4 Generate pictorial drawings. • Identify plane surfaces on isometric boxes • Construct an isometric view in the center of a drawing space • Identify the views of perspectives • Construct a drawing to the appropriate size and scale • Construct a one- & two point perspective	ADDA Apprentice Drafting Competency Mechanical #10
Two Skill/Concept	MDD 2.5 Examine drawing identification and management techniques used in mechanical drafting. • Apply necessary notes, material specifications, symbols, and other data to a drawing • Complete an assembly drawing showing the relationships the parts have to each other • Create a title block and border on each production drawing sheet	ADDA Apprentice Drafting Competency Mechanical #14

Notes:

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MDD 3: Understand the design for manufacturing and assembly.

Webb Level	*Sub-indicator*	*Integrated Content*
One Recall	MDD 3.1 Analyze different manufacturing processes. • Identify various types of machined holes	
One Recall	MDD 3.2 Identify basic welding symbols used in manufacturing design process. • Draw basic weld symbols • Create detail drawings for a welded part • Indicate welding process on a drawing	ADDA Apprentice Drafting Competency Mechanical #11

Notes:

MDD 4: Explore careers in drafting fields.

Webb Level	*Sub-indicator*	*Integrated Content*
Two Skill/Concept	MDD 4.1 Define/compare career pathways in drafting • Industry tours specifically in drafting businesses • Conduct career matcher quiz on sdmylife.com research drafting careers • Power point presentation on one career in drafting	SDMyLife.com

Notes: