



WOODWORKING AND CARPENTRY II 9TH-12TH

Approved by KSD Board of Education: May 18, 2025

Course Description:

In this course, students will build upon the basic skills learned in Woodworking I. Students will study more advanced woodworking techniques, beginning with using a jointer, planer, table saw, and miter saw to square up a rough-cut board. Students will then learn how to layout and create a picture frame using the router, followed by different joinery techniques and methods by building a wooden box. The course will conclude with students planning, sketching, pricing, and creating a unique project of their choice. Students will be expected to pay for the final project according to their calculated bill of materials.

Grade Level: 9th-12th Grade (semester)

Unit Scope and Sequence

Unit 1: Safety and Machinery Review

Unit 2: Jigs and Joinery

Unit 3: Capstone

Course Enduring Understandings:

- **Tool Proficiency:** Mastery of hand tools, power tools, and woodworking machines is essential for effectively shaping, joining, and finishing wood.
- **Joinery and Construction Techniques:** Strong and durable woodworking projects rely on appropriate joinery methods such as mortise and tenon, dovetails, pocket screws, etc.

Course Essential Questions:

- How do we properly use and maintain hand tools and power tools in woodworking?
- What are the advantages and disadvantages of different woodworking joints?

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Unit 1: Safety and Machinery Review

In this unit, students will review general shop safety, hand and power tools, and basic woodworking machinery.

Unit Essential Learning Targets	
<i>Enduring Understandings</i>	<i>Essential Questions</i>
• Proper measurement is critical for ensuring parts fit together correctly, and projects meet design specifications. • Understanding and following shop safety protocols is essential for maintaining a safe and productive work environment. • Understanding how to set up and calibrate woodworking machinery properly is crucial for achieving accurate and safe results. • Understanding the safety procedures for using both hand and power tools is vital for a safe working environment.	• How do you prepare yourself to work in a woodshop? • How do proper measuring techniques impact the success and accuracy of a project? • How can being proactive about safety help prevent accidents and injuries in the shop? • What is the proper setup and technique for using different hand and power tools? • How can woodworking machinery simplify and improve processes in the shop? • Why is it important to properly set up and calibrate woodworking machinery before use? • What safety precautions should be followed when operating woodworking machinery?
<i>Students must know:</i>	<i>Students must be able to:</i>
• Safety and procedures of tools and machinery learned in Woodworking I • Hand Tools • Band saw • Lathe • Drill Press • Sanders	• Set up and use all hand tools, power tools, and machinery in the shop safely and properly. • Apply their knowledge of tools and machinery to choose the appropriate tool for a required task.

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Unit 1: Safety and Machinery Review

MO Carpentry Technical Standards (CTS)

Priority Standard: Health, Safety, and Leadership (CTS.1.0)

Supporting Standards:

- Maintain and use proper PPE (CTS.1.2).
- Report hazards to your supervisor/instructor and other workers (CTS.1.3).
- Recognize how to protect yourself and others from hazards associated with materials and material handling (CTS.1.4).
- Recognize how to protect yourself and others from hazards associated with hand and power tools (CTS.1.5).
- Demonstrate proper cleanup procedures while storing, cleaning, and maintaining tools, equipment, and supplies (CTS.1.9).

Priority Standard: Hand and Power Tools (CTS.4.0)

Supporting Standards:

- Demonstrate the basic care, proper maintenance, and use of hand, portable, and stationary tools related to woodworking (CTS.4.1).
- Demonstrate proper selection and use of tools (CTS.4.2).
- Demonstrate the accurate use of common measuring and layout tools (CTS.4.3).
- Select the most appropriate blade or bit for a given operation (CTS.4.4).

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Unit 2: Jigs and Joinery

In this unit, students will learn to differentiate between the different types of wood joints and identify which joint is most appropriate for a given situation. Students will also use provided jigs to manufacture specific joints between two or more pieces of wood.

Unit Essential Learning Targets	
<i>Enduring Understandings</i>	<i>Essential Questions</i>
- Joining wood pieces is a fundamental skill essential to nearly all woodworking projects. - Various joinery techniques exist, and selecting the most appropriate method depends on the project's structure, function, and design. - Jigs enhance accuracy, efficiency, and safety in joinery, and selecting the right jig is crucial for achieving precise and consistent results.	- What is a woodworking jig and why do woodworkers use them? - Which jig is used for the table saw and which jig is used for the router table? - Which types of wood joints are weakest/strongest? - Which types of joints are used to join board edges, ends, and faces?
<i>Students must know:</i>	<i>Students must be able to:</i>
- Butt joint - Miter joint - Tongue and groove joint - Biscuit joint - Mortise and tenon joint - Pocket joint - Rabbet joint - Pocket joint - Dovetail joint - Cross-cut jig - Tenoning jig - Box jig - Dovetail jig - Pocket jig	- Rank the strength of wood joints based on given scenarios. - Recognize which wood joint is most appropriate for a given project. - Identify situations where the beauty of a joint supersedes the need for a more simpler joint (e.g., box joints vs. rabbet joints). - Use provided jigs to manufacture end grain, edge grain, and face grain joints.

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Unit 2: Jigs and Joinery

MO Carpentry Technical Standards (CTS)

Priority Standard: Processing, Problem-Solving, & Layout (CTS.2.0)

Supporting Standards:

- Construct projects specific to requirements and expectations (CTS.2.1)
- Read for information to understand the sequencing and phases of construction projects (CTS.2.2).
- Create and adjust layouts so that projects are plumb, square, and level (CTS.2.3)
- Use methods and tools to check the accuracy of a project including the diagonal method, the Pythagorean Theorem, and the use of leveling devices to check for elevation, level, and plumb (CTS.2.4).
- Interpret and apply information to calculate materials, estimate costs, and develop procedures to complete projects (CTS.2.5).
- Demonstrate the use of a jig/template (CTS.2.7).
- Demonstrate the sequence of cutting, assembly, and finishing projects (CTS.2.8)
- Identify different types of technical drawings including plan, elevation, section, and detail views (CTS.2.9).
- Identify and use drawing dimensions (CTS.2.10).

Priority Standard: Hand and Power Tools (CTS.4.0)

Supporting Standards:

- Demonstrate the basic care, proper maintenance, and use of hand, portable, and stationary tools related to woodworking (CTS.4.1).
- Demonstrate proper selection and use of tools (CTS.4.2).
- Demonstrate the accurate use of common measuring and layout tools (CTS.4.3).
- Select the most appropriate blade or bit for a given operation (CTS.4.4).

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Unit 3: Capstone

In this unit, students will use the design process to brainstorm, sketch, determine the cost of, and build a project of their choice.

Unit Essential Learning Targets	
<i>Enduring Understandings</i>	<i>Essential Questions</i>
• The design process encourages creative thinking and innovative solutions, essential for developing functional and unique projects. • Using a structured design process, including brainstorming, sketching, and prototyping, leads to well-thought-out projects that meet both needs and expectations. • Thorough planning and careful decision-making, such as selecting materials and calculating costs, ensure that projects are feasible and successful.	• How can I create my own projects using my skills in the woodshop? • How can creative thinking and innovation solve problems during the design and building process? • Why is calculating and managing costs important when designing and building a project?
<i>Students must know:</i>	<i>Students must be able to:</i>
• Sketching • Dimensioning • Basic math skills • Proper technique for safely using the machinery and tools	• Apply their knowledge of hand tools and machinery to create their own design and build. • Design and sketching a project. • Creating a cost analysis for a project. • Taking plans and building the project.

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Unit 3: Capstone

MO Carpentry Technical Standards (CTS)

Priority Standard: Processing, Problem-Solving, & Layout (CTS.2.0)

Supporting Standards:

- Construct projects specific to requirements and expectations (CTS.2.1)
- Read for information to understand the sequencing and phases of construction projects (CTS.2.2).
- Create and adjust layouts so that projects are plumb, square, and level (CTS.2.3)
- Use methods and tools to check the accuracy of a project including the diagonal method, the Pythagorean Theorem, and the use of leveling devices to check for elevation, level, and plumb (CTS.2.4).
- Interpret and apply information to calculate materials, estimate costs, and develop procedures to complete projects (CTS.2.5).
- Apply the appropriate mathematical calculations including formulas that determine area, volume, lineal, and square feet (CTS.2.6).
- Demonstrate the use of a jig/template (CTS.2.7).
- Demonstrate the sequence of cutting, assembly, and finishing projects (CTS.2.8)
- Identify different types of technical drawings, including plan, elevation, section, and detail views (CTS.2.9).
- Identify and use drawing dimensions (CTS.2.10).