KIRKWOOD
SCHOOL DISTRICT

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?

WOODWORKING AND CARPENTRY II 9TH-12TH
Unit 1: Safety and Machinery Review

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

<table>
<tr><th colspan="2">Unit Essential Learning Targets</th></tr>
<tr><th>Enduring Understandings</th><th>Essential Questions</th></tr>
<tr><td>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.</td><td>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?</td></tr>
<tr><th>Students must know:</th><th>Students must be able to:</th></tr>
<tr><td>Safety and procedures of tools and machinery learned in Woodworking I
Hand Tools
Band saw
Lathe
Drill Press
Sanders</td><td>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.</td></tr>
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WOODWORKING AND CARPENTRY II 9TH-12TH
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).

WOODWORKING AND CARPENTRY II 9TH-12TH
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.

<table>
<tr><th colspan="2">Unit Essential Learning Targets</th></tr>
<tr><td>Enduring Understandings</td><td>Essential Questions</td></tr>
<tr><td>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.</td><td>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?</td></tr>
<tr><td>Students must know:</td><td>Students must be able to:</td></tr>
<tr><td>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</td><td>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.</td></tr>
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WOODWORKING AND CARPENTRY II 9TH-12TH
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).

WOODWORKING AND CARPENTRY II 9TH-12TH
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	
Enduring Understandings	***Essential Questions***
● 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?
Students must know:	***Students must be able to:***
● 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.

WOODWORKING AND CARPENTRY II 9TH-12TH
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).