



SPRING GROVE AREA SCHOOL DISTRICT

PLANNED COURSE OVERVIEW



Course Title: Woodworking

Grade Level(s): 10-12

Units of Credit: .5

Classification: Elective

Length of Course: Half Year

Periods Per Cycle: 6

Length of Period: 40 Minutes

Total Instructional Time: 60 Hours

Course Description

This course serves as an introductory class to the skilled trade of woodworking. Students will use the design process to plan and fabricate wooden furniture and household items. Time will be spent on learning and practicing different types of wood joinery as well as testing wood joints for strength. Through the creation of furniture and other wooden projects, students will gain an understanding of woodworking machinery and the functions/capabilities of each machine. Connections will also be made to local woodworking facilities (cabinet makers, trim carpenters, etc.) to promote potential career opportunities for students.

Instructional Strategies, Learning Practices, Activities, and Experiences

Teacher Demonstrations, Guided Student Practice, Posted Objectives and Bell Ringers, Class Discussion, Attaining Minimum Competency Skills to Achieve Advanced Competency Skills, Working Through the Design Process, Skilled Trade Connections

Assessments

Journals, Weekly Checkpoints, Student Projects, Quizzes, Classroom Discussions, and Career Quality Grades

Materials/Resources

Teacher Generated Materials, Teacher Provided Grading and Scoring Rubrics, Access to Wood Lab and Machinery, Student Material Needs

Adopted: 5/22/23

Revised:

https://springgroveareascho.sharepoint.com/sites/PrivateSGASD/Shared Documents/AASG/NEWCURR/STEM - Technology/2023/Woodworking I/Woodworking_Overview.docx

<p>The Design Process in the Wood Shop</p>	
<p>CONTENT/KEY CONCEPTS</p>	<p>OBJECTIVES/STANDARDS</p>
<p>Overview: Students will discuss how the design process will look in the wood shop.</p>	<p>Objective(s): Students will be introduced to the design process and how it will be applied in the wood shop. Students will discuss the importance of being able to develop solutions as well as rely on peer and instructor feedback to improve their designs and projects. Students will apply the design process on a short project drawing and planning activity.</p> <p>Next Generation Science Standards (NGSS):</p> <ul style="list-style-type: none"> • HS-ETS1-1 - Analyze a major global or District challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants. • HS-ETS1-2 - Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering. • HS-ETS1-3 - Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts. • HS-ETS1-4 - Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem. <p>Minimum Competency Skills:</p> <p>The student will have knowledge and understanding of the design process and its elements.</p>

Safety and Shop Machinery	
CONTENT/KEY CONCEPTS	OBJECTIVES/STANDARDS
<p>Overview: Students will be introduced to shop safety and operating procedures for the wood shop machinery.</p>	<p>Objective(s): Students will be introduced to the shop layout and general locations of tools and machinery. Students will successfully complete safety quizzes on shop machinery. Students will demonstrate proficiency through correctly and safely operating shop machines.</p> <p>Next Generation Science Standards (NGSS):</p> <ul style="list-style-type: none"> • HS-ETS1-1 - Analyze a major global or District challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants. • HS-ETS1-2 - Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering. • HS-ETS1-3 - Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts. • HS-ETS1-4 - Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem. <p>Minimum Competency Skills:</p> <p>The student will have the ability to safely operate a table saw following course regulations. The student will have the ability to safely operate a planer following course regulations. The student will have the ability to safely operate a jointer following course regulations. The student will have the ability to safely operate a miter saw following course regulations. The student will have the ability to safely operate a drill press following course regulations. The student will have the ability to safely operate a cordless drill/driver following course regulations. The student will have the ability to safely operate a router (both palm and table-top) following course regulations. The student will have the ability to safely operate a palm sander following course regulations.</p>

Milling and Preparing Lumber	
CONTENT/KEY CONCEPTS	OBJECTIVES/STANDARDS
<p>Overview: Students will learn how to properly prepare a piece of rough lumber.</p>	<p>Objective(s): Students will be able to determine which machine is best used for the milling needs of a given piece of stock lumber. Students will demonstrate proficiency with milling by taking a piece of rough lumber through the process of becoming flat, square, and properly dimensioned.</p> <p>Next Generation Science Standards (NGSS):</p> <ul style="list-style-type: none"> • HS-ETS1-1 - Analyze a major global or District challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants. • HS-ETS1-2 - Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering. • HS-ETS1-3 - Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts. • HS-ETS1-4 - Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem. <p>Minimum Competency Skills:</p> <p>The student will have the ability to safely operate a table saw following course regulations. The student will have the ability to safely operate a planer following course regulations. The student will have the ability to safely operate a jointer following course regulations. The student will have the ability to safely operate a miter saw following course regulations. The student will have the ability to safely operate a drill press following course regulations. The student will have the ability to safely operate a cordless drill/driver following course regulations. The student will have the ability to make proper adjustments to a table saw as needed for a cut. The student will have the ability to make proper adjustments to a planer as needed for a cut. The student will have the ability to make proper adjustments to a miter saw as needed for a cut. The student will have the ability to measure and cut materials accurate to within 1/16 of an inch. The student will have the ability to mill a piece of rough-cut lumber to flat, square, and surfaced on 4 sides. The student will have the ability to select the proper machine to use for a given cut or operation.</p>

Wood Joints	
CONTENT/KEY CONCEPTS	OBJECTIVES/STANDARDS
<p>Overview: Students will be introduced to various types of wood joinery.</p>	<p>Objective(s): Students will identify and practice with different types of wood joints (butt joints, dowel joints, pocket hole joints, miter joints, rabbet joints, finger joints). Students will test the strength of different types of wood joints. Students will determine the most efficient wood joints to be used with potential projects they will be creating.</p> <p>Next Generation Science Standards (NGSS):</p> <ul style="list-style-type: none"> • HS-ETS1-1 - Analyze a major global or District challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants. • HS-ETS1-2 - Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering. • HS-ETS1-3 - Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts. • HS-ETS1-4 - Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem. <p>Minimum Competency Skills:</p> <p>The student will have the ability to safely operate a table saw following course regulations. The student will have the ability to safely operate a planer following course regulations. The student will have the ability to safely operate a jointer following course regulations. The student will have the ability to safely operate a miter saw following course regulations. The student will have the ability to safely operate a cordless drill/driver following course regulations. The student will have the ability to safely operate a router (both palm and table-top) following course regulations. The student will have the ability to make proper adjustments to a table saw as needed for a cut. The student will have the ability to make proper adjustments to a miter saw as needed for a cut. The student will have the ability to measure and cut materials accurate to within 1/16 of an inch. The student will have the ability to select the proper machine to use for a given cut or operation. The student will have the ability to identify a minimum of 4 different wood joints. The student will have the ability to select the proper type of wood joint to use for a given application. The student will have the ability to join 2 pieces of lumber using pocket hole joints. The student will have the ability to join 2 pieces of lumber using miter joints. The student will have the ability to join 2 pieces of lumber using butt joints (nails, screws, or dowels). The student will have the ability to join 2 pieces of lumber using rabbet joints.</p>

Furniture/End Table Construction	
CONTENT/KEY CONCEPTS	OBJECTIVES/STANDARDS
<p>Overview: Students will construct and finish a wooden end table.</p>	<p>Objective(s): Students will construct and finish a wooden end table. Students will follow demonstrations, project diagrams, and a check sheet to work through the steps of completing their table. Students will demonstrate proper finishing techniques through the application of wood stain and polyurethane.</p> <p>Next Generation Science Standards (NGSS):</p> <ul style="list-style-type: none"> • HS-ETS1-1 - Analyze a major global or District challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants. • HS-ETS1-2 - Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering. • HS-ETS1-3 - Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts. • HS-ETS1-4 - Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem. <p>Minimum Competency Skills:</p> <p>The student will have the ability to make proper adjustments to a table saw as needed for a cut. The student will have the ability to make proper adjustments to a planer as needed for a cut. The student will have the ability to make proper adjustments to a miter saw as needed for a cut. The student will have the ability to measure and cut materials accurate to within 1/16 of an inch. The student will have the ability to mill a piece of rough-cut lumber to flat, square, and surfaced on 4 sides. The student will have the ability to select the proper machine to use for a given cut or operation. The student will have the ability to describe 3 concerns that exist with seasonal wood movement. The student will have the ability to edge glue 2 or more pieces using wood glue and clamps to create a panel. The student will have the ability to join 2 pieces of lumber using pocket hole joints. The student will have the ability to use a jig and/or clamp to aid in workpiece placement for furniture assembly. The student will have the ability to prepare a surface for finish by progressively sanding down to 220-grit (or higher as needed). The student will have the ability to apply a finish to a workpiece (stain, oil, wax, polyurethane, etc.). The student will have the ability to calculate board-feet of lumber. The student will have the ability to accurately check a piece of furniture for square and level.</p>

Embellishing/Laser Engraving	
CONTENT/KEY CONCEPTS	OBJECTIVES/STANDARDS
<p>Overview: Students will design/construct a piece that has a laser engraved or epoxy detail.</p>	<p>Objective(s): Students will select and/or design a project that has an inlay or detail component (laser engraved cutting board, epoxy pour, wood inlays, etc.). For student individual ideas, students will successfully propose their project plan for approval through drawings and verbal descriptions. Students will demonstrate the ability to add detail to a wood piece through the completion of their project.</p> <p>Next Generation Science Standards (NGSS):</p> <ul style="list-style-type: none"> • HS-ETS1-1 - Analyze a major global or District challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants. • HS-ETS1-2 - Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering. • HS-ETS1-3 - Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts. • HS-ETS1-4 - Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem. <p>Minimum Competency Skills:</p> <p>The student will have the ability to safely operate a table saw following course regulations. The student will have the ability to safely operate a planer following course regulations. The student will have the ability to safely operate a jointer following course regulations. The student will have the ability to safely operate a miter saw following course regulations. The student will have the ability to safely operate a cordless drill/driver following course regulations. The student will have the ability to safely operate a router (both palm and table-top) following course regulations. The student will have the ability to safely operate a palm sander following course regulations. The student will have the ability to make proper adjustments to a table saw as needed for a cut. The student will have the ability to make proper adjustments to a planer as needed for a cut. The student will have the ability to make proper adjustments to a miter saw as needed for a cut. The student will have the ability to measure and cut materials accurate to within 1/16 of an inch. The student will have the ability to select the proper machine to use for a given cut or operation. The student will have the ability to use a jig and/or clamp to aid in workpiece placement for furniture assembly. The student will have the ability to prepare a surface for finish by progressively sanding down to 220-grit (or higher as needed). The student will have the ability to apply a finish to a workpiece (stain, oil, wax, polyurethane, etc.).</p>

Shelving/Storage Construction	
CONTENT/KEY CONCEPTS	OBJECTIVES/STANDARDS
<p>Overview: Students will design/construct a shelf or storage accent piece.</p>	<p>Objective(s): Students will modify an existing shelf design to fit their needs as well as provide updated drawings to support the modifications to their piece. Students will demonstrate that they can follow their plan through the completion of their project. Students will demonstrate proper wood finishing techniques through the application of a finish to their project.</p> <p>Next Generation Science Standards (NGSS):</p> <ul style="list-style-type: none"> • HS-ETS1-1 - Analyze a major global or District challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants. • HS-ETS1-2 - Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering. • HS-ETS1-3 - Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts. • HS-ETS1-4 - Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem. <p>Minimum Competency Skills:</p> <p>The student will have the ability to make proper adjustments to a table saw as needed for a cut. The student will have the ability to make proper adjustments to a planer as needed for a cut. The student will have the ability to make proper adjustments to a miter saw as needed for a cut. The student will have the ability to mill a piece of rough-cut lumber to flat, square, and surfaced on 4 sides. The student will have the ability to select the proper machine to use for a given cut or operation. The student will have the ability to edge glue 2 or more pieces using wood glue and clamps to create a panel. The student will have the ability to select the proper type of wood joint to use for a given application. The student will have the ability to join 2 pieces of lumber using pocket hole joints. The student will have the ability to join 2 pieces of lumber using miter joints. The student will have the ability to join 2 pieces of lumber using butt joints (nails, screws, or dowels). The student will have the ability to join 2 pieces of lumber using rabbet joints. The student will have the ability to prepare a surface for finish by progressively sanding down to 220-grit (or higher as needed). The student will have the ability to apply a finish to a workpiece (stain, oil, wax, polyurethane, etc.). The student will have the ability to accurately check a piece of furniture for square and level.</p>

Cabinet/Detailed Box Construction	
CONTENT/KEY CONCEPTS	OBJECTIVES/STANDARDS
<p>Overview: Students will design/construct a box with a sliding lid.</p>	<p>Objective(s): Students will demonstrate the ability to properly fabricate a box, miter, or rabbet joint through the construction of a small wooden box. Students will demonstrate the ability to fabricate a sliding lid through the construction of their wooden box. Students will demonstrate proper wood finishing techniques through the application of a finish to their project.</p> <p>Next Generation Science Standards (NGSS):</p> <ul style="list-style-type: none"> • HS-ETS1-1 - Analyze a major global or District challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants. • HS-ETS1-2 - Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering. • HS-ETS1-3 - Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs account for a range of constraints, including cost, safety, reliability, and aesthetics as well as possible social, cultural, and environmental impacts. • HS-ETS1-4 - Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem. <p>Minimum Competency Skills:</p> <p>The student will have the ability to safely operate a palm sander following course regulations. The student will have the ability to make proper adjustments to a table saw as needed for a cut. The student will have the ability to make proper adjustments to a planer as needed for a cut. The student will have the ability to make proper adjustments to a miter saw as needed for a cut. The student will have the ability to measure and cut materials accurate to within 1/16 of an inch. The student will have the ability to select the proper machine to use for a given cut or operation. The student will have the ability to describe 3 concerns that exist with seasonal wood movement. The student will have the ability to identify a minimum of 4 different wood joints. The student will have the ability to select the proper type of wood joint to use for a given application. The student will have the ability to join 2 pieces of lumber using pocket hole joints. The student will have the ability to join 2 pieces of lumber using miter joints. The student will have the ability to join 2 pieces of lumber using butt joints (nails, screws, or dowels). The student will have the ability to join 2 pieces of lumber using rabbet joints. The student will have the ability to prepare a surface for finish by progressively sanding down to 220-grit (or higher as needed). The student will have the ability to apply a finish to a workpiece (stain, oil, wax, polyurethane, etc.).</p>