Wood Manufacturing III:
Turning the Tables

First Semester

Course Information

Grade(s):	10-12
Discipline/Course:	Technology Education
Course Title:	Wood Manufacturing III: Turning the Tables, Semester I
Prerequisite(s):	Wood Manufacturing I: Introduction to Woodworking with Teacher's Permission, or Wood Manufacturing II: Making the Case for a Bedside Cabinet
Course Description: Program of Studies	This intermediate level course is designed to introduce students to the processes and techniques of leg and rail construction in furniture. Student skills and knowledge will be developed through tool and machine use. Techniques in lathe work, joinery and inlaying will also be offered. Upon completion of required projects, the student will continue on advanced project work.
Course Essential Questions:	● What are the economic aspects of woodworking as a potential career path and what opportunities and challenges lie ahead? ● What are the most important factors to consider when creating a safe woodworking environment? ● What is the concept of "form follows function" in woodworking design and how will it influence your project decisions? ● What are some of the factors to consider when choosing the right joinery for a particular woodworking project? ● What advantages are gained using machines to do work? ● Why is proper machine set-up so important? ● How do you choose the right tool or machine for specific tasks and how can you analyze the advantages and disadvantages of each type? ● How do you turn raw materials into usable products in woodworking? ● How can lathe work be used to create unique and beautiful woodworking elements? ● How do you choose the right clamp, cauls, glues or mechanical fasteners for your project?
Course Enduring	● Woodworking is a process of transformation that involves taking raw materials, such as logs and

Understandings:	lumber, and transforming them into finished products, such as furniture, cabinets, and toys. ● It is important to be able to identify and safely use the resources, processes, concepts, and tools related to woodworking technology. ● It is important to be trained on how to use woodworking equipment safely and efficiently. ● A woodworking plan or working drawing is a blueprint that provides instructions for how to construct a project. ● Design choices for a given project depends on a number of factors, including the type of wood, the desired strength, and the aesthetic considerations. ● Tabletop styles can be used to create tables that are both functional and beautiful. ● Woodworking is a practical field that requires students to apply their knowledge and skills to solve real-world problems. ● It is important to be trained on how to use woodworking equipment safely and efficiently. ● There are a variety of woodworking cutting techniques, each with its own advantages and disadvantages. ● Woodworking can help students develop the ability to persevere in the face of challenges and to learn from their mistakes. ● The ability to read and interpret drawings and plans is a valuable skill for anyone to have, regardless of their chosen career path. ● Leg and rail construction is a basic woodworking technique that can be used to create a wide variety of furniture and structures.
Duration/Credit:	Semester / 0.5 credit
Course Materials/ Resources:	Machinery and consumables
FPS Course Academic Expectation(s):	CC: Creating and Constructing CI: Conveying Ideas
Semester at a Glance (Units)	Unit 1: Course Introduction and General Safety (1 week) Unit 2: Project Design (1-2 Weeks) Unit 3: Machine Use (4 weeks) Unit 4: Project Construction (13 weeks)

Unit Number and Title:	Unit 1 - Course Introduction and General Safety
Duration:	1 week
Resource(s):	Equipment and consumables
Unit Overview:	Students will review safety practices and policies. This will include the safety practices for specific machinery and include the procedures related to workplace and job-site safety, personal protective equipment, machine safety, and material handling practices.
Learning Goals	
Standard(s):	**CT Standards Wood Technology 2014** WM.02 Describe and demonstrate the procedures related to workplace and job-site safety including personal protective equipment, machine safety, and material handling practices. WM.02.01 Demonstrate safe material handling practices. WM.02.02 Demonstrate and explain knowledge of workplace safety procedures.*(A2) WM.02.03 Demonstrate and explain knowledge of personal safety practices pertaining to eye wear, footwear, clothing, and personal protective equipment (PPE) used in wood technology.*(A3) WM.02.04 Describe safety practices for specific machines. WM.02.05 Demonstrate knowledge of proper use, storage, and disposal of hazardous materials following OSHA's proper safety practices for a woodworking facility.*(A1)
Essential Question(s):	● What are the economic aspects of woodworking as a potential career path and what opportunities and challenges lie ahead? ● What are the most important factors to consider when creating a safe woodworking environment?
Enduring Understanding(s):	● Woodworking is a process of transformation that involves taking raw materials, such as logs and lumber, and transforming them into finished products, such as furniture, cabinets, and toys.

	● It is important to be able to identify and safely use the resources, processes, concepts, and tools related to woodworking technology. ● It is important to be trained on how to use woodworking equipment safely and efficiently.
Learning Goal(s): Students will be able to use their learning to: (Content/ Skills)	**Content:** (Students will know…) ● OSHA and its role in a woodworking facility. ● the procedure to safely dispose of flammable rags and oily finishes. ● the rules and routines for operating in a professional and respectful manner in a manufacturing environment. **Skills:** (Students will be able to…) ● describe the dangers and ramifications of unsafe behavior. ● develop a personal respect for machines, equipment and colleagues in the shop area. ● identify and describe various types of personal protective equipment. ● read and discuss information on OSHA, EPA and other safety regulations. ● describe safe material handling practices.

Unit Number and Title:	Unit 2 - Project Design
Duration:	1-2 Weeks
Resource(s):	Equipment and Consumables
Unit Overview:	Students will create a 1/4-scale and isometric drawings of their project including all the necessary joinery. From that they will create a stock-list that will guide them while they mill and machine their project pieces.
Learning Goals	
Standard(s):	**CT Standards Wood Technology 2014** WM.04 Explain and be able to demonstrate the methods involved in turning raw materials into useable products. WM.04.01 Describe and interpret technical drawings. WM.04.02 Describe and prepare rough drawings and sketches. WM.04.03 Explain and prepare a cut list or bill of material from a basic plan and assembly drawing. WM.04.04 Interpret a design to facilitate replication. WM.04.05 Describe and identify fractional measurements from a basic plan and assembly drawings. WM.04.07 Extrapolate information from a set of plans. WM.04.08 Measure accurately to a sixteenth of an inch. WM.04.09 Estimate materials quantities in both board feet and linear feet. WM.04.10 Interpret a design to facilitate replication.
Essential Question(s):	● What is the concept of "form follows function" in woodworking design and how will it influence your project decisions? ● What are some of the factors to consider when choosing the right joinery for a particular woodworking project?
Enduring Understanding(s):	● A woodworking plan or working drawing is a blueprint that provides instructions for how to construct a project.

	● Design choices for a given project depends on a number of factors, including the type of wood, the desired strength, and the aesthetic considerations. ● Tabletop styles can be used to create tables that are both functional and beautiful.
Learning Goal(s): *Students will be able to use their learning to:* (Content/ Skills)	**Content:** (Students will know…) ● the identity and use of the following measuring, layout, and marking tools: steel rule, tape measure, combination square, sliding "T" bevel, and compass. ● the difference between technical drawings and rough drawings or sketches. ● the meaning of "scale" and how it applies to technical drawings. ● how to describe and identify fractional measurements from a basic plan and assembly drawings. ● the difference between both nominal and actual dimensions. ● how to draw and visually communicate simple geometric shapes and parts. ● the difference between board feet and linear feet. **Skills:** (Students will be able to…) ● demonstrate an understanding of rough drawings and sketches. ● explain and use fractional dimensions. ● identify, use and maintain measuring, layout, and marking tools. ● measure accurately to a sixteenth of an inch. ● create a 1/4-scale drawing of their table.

Unit Number and Title:	Unit 3 – Machine Use
Duration:	4 weeks
Resource(s):	Equipment and consumables
Unit Overview:	Students will continue expanding their knowledge of new tools and new techniques utilizing tools they have already learned how to use in new ways, such as table saws and routers.
Learning Goals	
Standard(s):	**CT Standards Wood Technology 2014** WM.03 Identify and describe the safe and appropriate use of various types of hand and power tools and machinery used for building. WM.03.06 Identify proper use and function of the following hand tools: cross cut saw, rip saw, level, coping saw, nail set, hand plane, chisel, and file.*(B11) WM.03.08 Identify the proper use and function specialty machinery (e.g. drill presses, jointer, surface planers, table saws, power miter saws, band saws, scroll saws, and stationary sanders) WM.03.09 Identify proper use and function of the table and miter saws.*(B12) WM.03.10 Explain and demonstrate correct use of planers. WM.03.11 Explain and demonstrate use of molders WM.03.12 Identify functions and demonstrate use of wood lathes. WM.03.13 Identify and demonstrate use and function of sanders. WM.03.14 Select appropriate tools, procedures, and/or equipment.
Essential Question(s):	● What advantages are gained using machines to do work? ● Why is proper machine set-up so important? ● How do you choose the right tool or machine for specific tasks and how can you analyze the advantages and disadvantages of each type? ● How do you turn raw materials into usable products in woodworking?
Enduring	● Woodworking is a practical field that requires students to apply their knowledge and skills to

Understanding(s):	solve real-world problems. ● It is important to be trained on how to use woodworking equipment safely and efficiently. ● There are a variety of woodworking cutting techniques, each with its own advantages and disadvantages.
Learning Goal(s): Students will be able to use their learning to: (Content/ Skills)	**Content:** (Students will know…) ● the safety guidelines for the tools and machinery in the woodshop. ● the methods for turning raw materials to useful products within the woodshop. ● the woodworking machines and tools names and their basic functions. ● the "Milling Process," its steps, and the safety and operation of the machinery utilized in "milling" a board. ● the definitions of flat, square, and coplanar. ● the differences between rough and finished dimensions. **Skills:** (Students will be able to…) ● safely cut a miter. ● safely cut small pieces on the chop saw. ● sharpen hand tools. ● identify and describe the safe and appropriate use of various types of hand and power tools and machinery used for building. ● demonstrate the methods involved in turning raw materials into useful products. ● accurately mill a board to rough and finished dimensions. ● drill holes. ● shape edges with a hand and/or table router. ● sand with a disc, belt or spindle sander. ● cut angles with a miter saw. ● use a mortiser and/or horizontal boring machine. ● utilize Lathe to turn projects.

Unit Number and Title:	Unit 4 – Project Construction
Duration:	13 weeks
Resource(s):	Equipment and Consumables
Unit Overview:	Students will explore leg and rail construction and use this knowledge to construct and produce parts of a table. They will learn how to properly make and utilize several basic wood joints in construction of their table. In the process they will continue to learn and practice setting-up and adjusting a variety of wood manufacturing power equipment.
Learning Goals	
Standard(s):	**CT Standards Wood Technology 2014** WM.03.02 Identify proper use and function of the following portable power tools: circular saw, drill, jig/saber saw, finishing sanders, and routers.*(B9) WM.03.03 Identify proper use and function of the following fastening tools: hammer, Phillip head screwdriver, and slotted/flat head screwdriver.*(B10) WM.03.04 Demonstrate and explain knowledge of proper use and storage of portable power tools.*(A6) WM.03.05 Demonstrate and explain knowledge of proper use and storage of basic hand tools.*(A5) WM.03.06 Identify proper use and function of the following hand tools: cross cut saw, rip saw, level, coping saw, nail set, hand plane, chisel, and file.*(B11) WM.03.07 Identify proper use and function of stationary saws. WM.03.08 Identify the proper use and function specialty machinery (e.g. drill presses, jointer, surface planers, table saws, power miter saws, band saws, scroll saws, and stationary sanders) WM.03.09 Identify proper use and function of the table and miter saws.*(B12) WM.03.10 Explain and demonstrate correct use of planers. WM.04 Explain and be able to demonstrate the methods involved in turning raw materials into useable products. WM.04.11 Consider the natural characteristics of grain, knots, and checks when laying out a board.*(C19)

	WM.04.13 Identify and select the proper cutting process based on grain direction.*(E23) WM.04.14 Identify how grain direction affects a material's strength.*(E24) WM.04.15 Understanding kerf and its application to cutting and layout operations.*(E25)
Essential Question(s):	● How can lathe work be used to create unique and beautiful woodworking elements? ● How do you choose the right clamp, cauls, glues or mechanical fasteners for your project?
Enduring Understanding(s):	● Woodworking can help students develop the ability to persevere in the face of challenges and to learn from their mistakes. ● The ability to read and interpret drawings and plans is a valuable skill for anyone to have, regardless of their chosen career path. ● Leg and rail construction is a basic woodworking technique that can be used to create a wide variety of furniture and structures.
Learning Goal(s): Students will be able to use their learning to: (Content/ Skills)	**Content:** (Students will know…) ● the process for laminating boards for different designs. ● the use of a handscrew to laminate leg stock correctly. ● the steps to creating a tapered or cabriole leg. ● the construction methods for different type of drawers and runner styles. ● the definition of a "leg and rail" joint. ● mortise and tenon joinery and its variations. **Skills:** (Students will be able to…) ● extrapolate information from a set of plans to describe and interpret technical drawings. ● construct and produce parts of a "Leg and Rail" style table. ● properly make and utilize several basic wood joints in construction of a project. ● set-up and adjust a variety of woodworking machines. ● laminate boards by gluing and clamping. ● identify different styles of table legs. ● construct legs by laminating squared up pieces of wood. ● square up a leg blank. ● taper cut a leg or turn a leg on the lathe using the standard tools and techniques.

	● build an overlay, lipped or flush drawer. ● construct at least one type of drawer mount. ● recognize at least three tabletop styles and construct one.