

**MT. DIABLO UNIFIED SCHOOL DISTRICT  
COURSE OF STUDY  
DRAFT**

**COURSE TITLE:** Woodworking Technology I  
**COURSE NUMBER:** 7030  
**CALPADS NUMBER:** 5507  
**CST:**  
**DEPARTMENT:** Career and Technical Education  
**NCLB TEACHER**  
**CREDENTIAL REQUIREMENT:** To be determined by the Credential Analyst in Personnel  
**LENGTH OF COURSE:** One Year  
**CREDITS PER SEMESTER:** 5  
**GRADE LEVEL(S):** 9-12  
**GRADUATION REQUIREMENT OR ELECTIVE:** Elective  
**PREREQUISITES:** None

**BOARD OF EDUCATION ADOPTION:**

**COURSE DESCRIPTION:**

Woodworking Technology I introduces students to the basic elements and skills used in cabinet making, furniture making, and carpentry. Students will be able to demonstrate knowledge of safe and practical hand and power tool operation and will be taught elements of good design, craftsmanship, construction techniques, and green technologies. Students will be taught to identify and choose appropriate materials for projects and become informed about being critical consumers of wood products.

**COURSE OUTLINE:**

**1. MAJOR GOALS**

- 1.1 To acquire the ability to work safely within a shop setting.
- 1.2 To motivate the desire to perpetuate the art and craft of woodworking.
- 1.3 To introduce the elements of good design and fabrication of woodworking products.
- 1.4 To instill confidence through individual challenges and creative problem based learning.
- 1.5 To develop the recognition and understanding of the relationships and relevance between wood technologies and core academic subject areas.
- 1.6 To improve subject related skill sets through problem/project based learning.
- 1.7 To introduce career opportunities and industry trends in the woodworking and construction trades.

## **2. PERFORMANCE OBJECTIVES:**

### PATHWAY OBJECTIVES

- A1.0 Students understand measurement systems in the planning and layout process used in the cabinetmaking and wood products industry
  - A1.1. Know design solutions to common problems in cabinetmaking and wood products
  - A1.2 Understand calculation procedures for materials and production requirements for wood products
  - A1.4 Know conventional measurement processes for cabinet making and wood products, linear measurements and conversions of fractions and decimals
  
- A2.0 Students understand the safe and appropriate use of hand tools common to the cabinetmaking and wood products industry
  - A2.1 Use common hand tools and accessories, such as planers, shapers, clamping and gripping tools, pliers, wrenches, wood chisel, hammers, hand saws and squares, safely and properly
  - A2.2 Maintain and care for common hand tools
  
- A3.0 Students understand the safe and appropriate use of portable power tools common to the cabinetmaking and wood products industry
  - A3.1 Use portable power tools, such as single and compound miter saws, drills, sanders, saber saws, and routers safely and appropriately
  - A3.2 Use pneumatic tools, such as pneumatic clamps, grips, framing nails guns, and finishing and brad nail guns, safely and properly
  - A3.3 Maintain and care for portable power and pneumatic tools
  
- A4.0 Students understand the safe and appropriate use of stationary power machines and equipment common to the cabinetmaking and wood products Industry
  - A4.1 Understand the proper and safe use of stationary power tools used in the milling process, such as shapers, sanders, joiners, table saws, and band saw
  - A4.4 Know the basic care, maintenance, and lock-out procedures for stationary power tools
  
- A6.0 Students understand the value and necessity of practicing occupational safety in the cabinetmaking industry shop
  - A6.1 Know the safety rules in the cabinetmaking work environment
  - A6.2 Use hand tools (wood chisels, drills, coping saws) and power tools (routers, sanders, planers) safely in the cabinet working environment
  - A.6.3 Understand how to handle and dispose of toxic materials safely and use protective clothing as needed when using lacquers, acetone, thinners, staining materials, and so forth in an environmentally responsible manner

- A7.0 Students understand the variety of production process used in the cabinetmaking and wood products industry
  - A7.1 Design and create cabinet and wood products
  - A7.3 Use stationary and portable power tools in milling the components for cabinets and wood products
  - A7.4 Use stationary and portable power tools in the assembly of cabinet and wood product components
  - A7.5 Use finish tools (e.g., airless sprayers, palm sanders) and techniques for finishing cabinets and wood products
  
- A8.0 Students understand the impact of financial, technical, and environmental trends on the past and future of the cabinetmaking and wood products industry
  - A8.3 Understand issues of the sustainable used of wood product resources
  
- A9.0 Students understand career preparation and how it applies across all standards for students planning to enter and advance successfully in the cabinetmaking and wood products industry
  - A9.1 Understand the careers that are available in cabinetmaking and wood products manufacturing and related occupations (e.g., custom crafts, furniture making, marketing)

## FOUNDATION OBJECTIVES / STANDARDS

- 1.1 Mathematics
  - 2.1 Use estimations to verify the reasonableness of calculated results
  - 2.2 Apply strategies and results from simpler problems to more complex problems
  - 2.3 Estimate unknown quantities graphically and solve for them by using logical reasoning and arithmetic and algebraic techniques
  - 2.7 Indicate the relative advantages for exact and approximate solutions to problems and give answers to specified degree of accuracy
  - 2.8 Make precise calculations and check the validity of the results from the context of the problem
  - 3.1 Evaluate the reasonableness of the solution in the context of the original situation
  - 3.2 Note the method of deriving the solution and demonstrate a conceptual understanding of the derivation by solving similar problems
  - 3.3 Develop generalizations of the results obtained and the strategies used and apply them to new problem situations
  - 8.0 Students know, derive, and solve problems involving the perimeter, circumference, area, volume, lateral areas, and surface area of common geometric figures
  - 11.0 Students determine how changes in dimensions affect the perimeter, area, and volume of common geometric figures and solids
  - 12.0 Students find and use measures of sides and of interior and exterior angles of triangles and polygons to classify figures and solve problems

15.0 Students use the Pythagorean Theorem to determine distance and find missing lengths of sides of right triangles

### 1.3 History- Principals of Economics

12.4.3 Discuss wage differences among jobs and professions, using the laws of demand and supply and the concept of productivity

## 2.0 Communications

### 2.1 Reading

2.6 Demonstrate use of sophisticated learning tools by following technical directions (e.g., those found with graphic calculators and specialized software programs and in access guides to World Wide Web sites on the internet)

2.3 Verify and clarify facts presented in other types of expository texts by using a variety of consumer, workplace, and public documents

### 2.2 Writing

1.4 Plan and conduct multiple-step information searches by using computer networks and modems

1.5 Achieve an effective balance between researched information and original ideas

1.7 Use systematic strategies to organize and record information (e.g., anecdotal scripting, annotated bibliographies)

### 2.4 Listening and Speaking

1.2 Paraphrase a speaker's purpose and point of view and ask relevant questions concerning the speaker's content delivery, and purpose

1.3 Organize information to achieve particular purposes by matching the message, vocabulary, voice modulation, expression, and tone to the audience and purpose

### 2.5 Multimedia

Understand the importance of technical and computer aided design and drawing Technologies essential to the language of engineering and design industry, including reading, writing, interpreting, and creating drawings, sketches and schematics using engineering and design industry conventions and standards: interpreting and understanding detailed information provided from available technical documents, both print and electronic, and from experience people; and using computers calculators, multimedia equipment, and other devices in a variety of applications

## 3.0 Career Planning and Management

3.1 Know the personal qualifications, interests, aptitudes, knowledge, and skills necessary to succeed in careers

3.4 Understand the role and function of professional organizations, industry associations and organized labor in a productive society

## 5.0 Problem Solving and Critical Thinking

- 5.1 Apply appropriate problem-solving and critical thinking skills to work issues and tasks
- 5.2 Understand the systematic problem-solving models that incorporate input, process, outcome and feedback components
- 5.3 Use critical thinking skills to make informed decisions and solve problems
- 5.4 Apply troubleshooting strategies, including failure-analysis procedures, in three dimensional product material and design work
- 5.5 Apply the design process in the design, development, evaluation, and refinement of a prototype for a construction industry product
  
- 6.0 Health and Safety
  - 6.1 Know the policies, procedures, and regulations regarding health and safety in the workplace, including employers' and employees' responsibilities
  - 6.2 Understand critical elements for health and safety practices related to storing, cleaning, and maintaining tools, equipment, and supplies
  - 6.6 Understand the importance of identifying health and safety problems as well as asking for help or approaching supervisors to discuss concerns
  
- 7.0 Responsibility and Flexibility
  - 7.1 Understand the qualities and behaviors that constitute a positive and professional work demeanor
  - 7.2 Understand the importance of accountability and responsibility in fulfilling personal, community and workplace roles
  - 7.3 Understand the need to adapt to a varied roles and responsibilities
  - 7.4 Understand that individual actions can affect the larger community
  - 7.5 Understand employer and employee responsibilities in the workplace
  
- 8.0 Ethics and Legal Responsibilities
  - 8.2 Understand the concept and application of ethical and legal behavior consistent with workplace standards
  - 8.3 Understand the role of personal integrity and ethical behavior in the workplace
  - 8.4 Understand how social, organizational, and technological systems work
  
- 9.0 Leadership and Teamwork
  - 9.1 Understand the characteristics and benefits of teamwork, leadership, and citizenship the school, community and workplace
  - 9.3 Understand how to organize and structure work individually and in teams for effective performance and the attainment of goals
  - 9.4 Know the multiple approaches to conflict resolution and their appropriateness for a variety of situations in the workplace
  - 9.5 Understand how to interact with other in ways that demonstrate respect for individual and cultural differences and for the attitudes and feelings of others
  - 9.6 Communicate ideas to justify positions, persuade and convince others, confirm responsibility, and evaluate existing policies and procedures

## 10.0 Technical Knowledge and Skill

- 10.2 Maintain and troubleshoot equipment used in the construction industry
- 10.3 Use, store and allocate materials efficiently, and use space efficiently
- 10.6 Understand universal graphic conventions and symbols and technical manuals and specifications
- 10.7 Understand the attributes of good design
- 10.9 Understand the need to participate in sector-related professional improvement activities, Skills USA, other career technical education leadership and skill associations, and related career pathway specializations

### 3. CONTENT OUTLINE:

3.1.a Pathway Standard A1.0 Students will understand measurement systems in the planning and layout process used in the cabinetmaking and wood products industry.

3.1.b Foundation Standard 1.1 Mathematics

3.1.c Foundation Standard 2.1 Reading

3.1.d Foundation Standard 2.5 Multimedia

3.1.1 Proper use of measurement and layout tools

3.1.1.1 Demonstrate use of tape measures tri-squares, rulers, architectural scales, engineer's scales, t-bevel squares, framing squares

3.1.2 Transfer measurements from plans to materials

3.1.2.1 Transfer scaled dimensions to wood

3.1.3 Review mathematical estimations and calculations to verify project results

3.1.3.1 Compare finished project with written plans

3.1.4 Read and interpret plans to construct various projects

3.1.4.1 Building jewelry boxes, shelves, bird houses.

3.1.5 Introduce computer aided design

3.1.5.1 Allow students to use the computer in designing projects

3.2.a Pathway Standard A2.0 Students understand the safe and appropriate use of hand tools common to the cabinetmaking and wood products industry.

3.2.b Foundation Standard 2.1 Reading (safety packet)

3.2.c Foundation Standard 2.2 Writing

3.2.d Foundation Standard 2.4 Listening and speaking

3.2.1 Demonstration of safe use and proper care of hand tools

3.2.1.1 Wearing eye protection, bench vice, scratch awl, hammer.

3.2.2 Identify the similarities to stationary equipment

3.2.2.1 Compare hand saw/table saw, coping saw/jig saw, brace & bit/drill press.

3.2.3 Proper care of hand tools

3.2.3.1 Returning tools to proper storage area, carrying tools correctly.

3.2.4 Safety Packet

3.2.4.1 Demonstrate, discuss and write safety procedures

3.3.a Pathway Standard A3.0 Students understand the safe and appropriate use of portable

- power tools common to the cabinetmaking and wood products industry
- 3.3.b Foundation Standard 2.1 Reading (safety packet)
- 3.3.c Foundation Standard 2.2 Writing
- 3.3.d Foundation Standard 2.4 Listing and Speaking
  - 3.3.1 Demonstration of safe use and proper care of portable power tools
    - 3.3.1.1 Demonstrate use and safety of drills, saws and sanders
  - 3.3.2 Identify the similarities to portable and stationary power tools
    - 3.3.2.1 Compare circular saw/table saw, saber saw/jig saw
  - 3.3.3 Proper care, maintenance and repair of portable power tools
    - 3.3.3.1 Replace cords on drills, circular saws, sanders
  - 3.3.4 Safety Packet
    - 3.2.5.1 Demonstrate, discuss and write safety procedures
- 3.4.a Pathway Standard A4.0 Students understand the safe and appropriate use of stationary power machines and equipment common the cabinetmaking and wood products industry
- 3.4.b Foundation Standard 2.1 Reading (safety packet)
- 3.4.c Foundation Standard 2.2 Writing
- 3.4.d Foundation Standard 2.4 Listing and Speaking
  - 3.4.1 Demonstration of safe use and proper care of stationary equipment
    - 3.3.1.1 Practice use of shaper, sanders, jointers, table saws, and band saws
  - 3.4.2 Demonstration of squaring sequence
    - 3.3.2.1 Use jointer, table saw, and planer
  - 3.4.3 Proper care, maintenance and repair of stationary power equipment
    - 3.3.3.1 Demonstrate lubrication, blade care, safety attachments
  - 3.4.4 Safety Packet
    - 3.2.5.1 Demonstrate, discuss and write safety procedures
- 3.5.a Pathway Standard A6.0 Students understand the value and necessity of practicing occupational safety in the cabinetmaking industry shop
- 3.5.b Foundation Standard 2.1 Reading
- 3.5.c Foundation Standard 2.2 Writing
- 3.5.d Foundation Standard 2.4 Listing and Speaking
- 3.5.e Foundations Standard 6.0 Health and Safety
  - 3.5.1 Environmental safety
    - 3.5.1.1 Demonstrate dust collection and storage of hazardous materials
  - 3.5.2 Woodshop management
    - 3.5.2.1 Demonstrate clean-up procedures, project and material storage
    - 3.5.2.2 Introduce shop / school schedule, rules and regulations
    - 3.5.2.3 Introduce grading matrix
- 3.6.a Pathway Standard A7.0 Students understand the variety of production process used in the cabinetmaking and wood products industry
- 3.6.b Foundation Standard 1.1 Mathematics
- 3.6.c Foundation Standard 2.1 Reading
- 3.6.d Foundation Standard 2.3 Listening and Speaking

- 3.6.e Foundation Standard 5.0 Problem solving and critical thinking
- 3.6.f Foundation Standard 7.0 Responsibility and Flexibility
- 3.6.g Foundation Standard 9.0 Leadership and Teamwork
- 3.6.h Foundation Standard 10.0 Technical Knowledge and skill
- 3.6.i Foundation Standard 2.5 Multimedia
  - 3.6.1 Use of proper gluing materials and clamping techniques
    - 3.5.1.1 Assemble jewelry box with appropriate clamps, glue
  - 3.6.2 Proper selection of fasteners and hardware
    - 3.5.2.1 Assemble jewelry box with appropriate nails, screws, bolts
  - 3.6.3 Read instructions and interpret printed plans
    - 3.5.3.1 Cut and machine project parts per blueprints
  - 3.6.4 Interpret mathematical ratios and measurement from plans to projects
    - 3.5.4.1 Transfer scale dimensions from plans to materials
  - 3.6.5 Identify lumber types and characteristic
    - 3.5.5.1 Compare / contrast pine and douglas fir for appropriate use
  - 3.6.6 Project estimation
    - 3.5.6.1 Estimate the amount of materials needed for projects
  - 3.6.7 Proper selection of joinery
    - 3.5.5.1 Discuss the pros/cons of the box, miter and dovetail joints
    - 3.5.5.2 Demonstrate the dovetail joint.
  - 3.6.8 Proper selection of abrasives
    - 3.5.6.1 Review the progression of different abrasive grades and types
  - 3.6.9 Proper selection of finish materials
    - 3.5.7.1 Review the different types and proper application of finishing materials
  - 3.6.10 Identify advantages/ disadvantages of teamwork/ individual project management
    - 3.5.10.1 Provide opportunity for individual and group work
    - 3.5.10.2 Evaluate lessons learned with group / individual projects
  - 3.6.11 Identify technical components in good design
    - 3.5.11.1 Review the ratios of the golden ratio
    - 3.5.11.2 Review the live loads on material selection
  - 3.6.12 Identify computer controlled production processes
    - 3.5.12.1 Identify the uses of computer controlled routers and lasers
- 3.7.a Pathway Standard A8.0 Students understand the impact of financial, technical, and environmental trends on the past and future of the cabinetmaking and wood products industry
- 3.7.b Foundation Standard 1.3 History- Principles of economics
- 3.7.c Foundation Standard 2.4 Listening and speaking
- 3.7.d Foundation Standard 3.0 Career Planning and Management
- 3.7.e Foundation Standard 5.0 Problem solving and Critical thinking
- 3.7.f Foundation Standard 6.0 Health and Safety
  - 3.7.1 Identify industry trends throughout the last century
    - 3.7.1.1 Discuss the wage escalation
    - 3.7.1.2 Discuss the sustainable growth of materials
    - 3.7.1.3 Discuss the pros / cons and the evolution of green technologies
  - 3.7.2 Provide opportunities to explore post secondary opportunities
    - 3.7.2.1 Invite guest speakers from industry, technical schools, colleges, and



- universities
- 3.7.2.2 Field trips to tour various production facilities, job sites, and offices
- 3.7.3 Evaluate project designs, and production methods
  - 3.7.3.1 Compare / contrast student projects
- 3.7.4 Explore the issues around the toxic materials used in a woodshop
  - 3.7.4.1 Explain the differences in oil and water based finish materials
- 3.8a Pathway Standard A9.0 Students understand career preparation and how it applies across all standards for students planning to enter and advance successfully in the cabinetmaking and wood products industry
- 3.8.b Foundation Standard 2.4 Listening and Speaking
- 3.8.c Foundation Standard 3.0 Career Planning and Management
- 3.8.d Foundation Standard 7.0 Responsibility and Flexibility
- 3.8.e Foundation Standard 8.0 Ethics and Legal Responsibility
- 3.8.f Foundation Standard 9.0 Leadership and Teamwork
- 3.8.g Foundation Standard 10.0 Technical Knowledge and Skill
  - 3.8.1 Provide opportunities to explore post secondary options
    - 3.8.1.1 Invite guest speakers from industry, technical schools, colleges, and universities
    - 3.8.1.2 Field trips to tour various production facilities, job sites, and offices
  - 3.8.2 Explore soft skills needed
    - 3.8.2.1 Discuss and practice accountability, timeliness, and being a team player through the required daily routine
    - 3.8.2.2 Discuss and practice the need to be flexible with co-workers, customers, and suppliers by having to adapt through changes in directed activities
  - 3.8.3 Explore the necessity of ethical behavior in the workplace
    - 3.8.3.1 Discuss and explore the role of social, organizational and personal integrity as practiced in the classroom and job situations
  - 3.8.4 Explore the vital role of teamwork in the modern workplace
    - 3.8.4.1 Identify how the accomplishments of a group differ from the accomplishments of individuals
  - 3.8.5 Explore the workplace before and after the introduction of computers
    - 3.8.5.1 Compare / contrast workplace productivity before and after the introduction of computer technology
    - 3.8.5.2 Discuss the future of computers in industrial production facilities

#### **4. INSTRUCTIONAL METHODS AND/OR STRATEGIES:**

- 4.1 Lecture and demonstration
- 4.2 Class written and oral work
- 4.3 Opportunity to build reading and writing skills
- 4.4 Opportunity to build mathematics skills
- 4.5 Woodworking projects and lab work
- 4.6 Computer technology and instruction
- 4.7 Informational Worksheets

## **5. EVALUATION OF STUDENT PROGRESS:**

- 5.1 Evaluation of Lab work/ project work
- 5.2 Class written assignments
- 5.3 Tests and quizzes
- 5.4 Classroom participation

## **6. TIME ESTIMATES:**

- 6.1 Orientation - one week
- 6.2 Safety - three weeks
- 6.3 Planning and Design - two weeks
- 6.4 Hand Tools - one week
- 6.5 Portable Tools - three weeks
- 6.6 Power Machine Tools- four Weeks
- 6.7 Measurement and Layout - two weeks
- 6.8 Fasteners- three days
- 6.9 Joinery- two weeks
- 6.10 Gluing and Fabricating - twelve weeks
- 6.11 Abrasives - one week
- 6.12 Finishes - one week
- 6.13 Materials - two weeks
- 6.14 Career Information - one week
- 6.15 Consumer Information - one week

## **7. INSTRUCTIONAL MATERIALS:**

- 7.1 District adopted textbooks and supplementary materials that comply with the California Education Code
- 7.2 Teacher prepared materials
- 7.3 Charts, models and multimedia, technology and software that comply with the California Education Code
- 7.4 Presentation of outside speakers from Industry

## **8. EXPECTATIONS FOR TEACHERS:**

- 8.1 Instructors will continue with professional development to be current with changes in the wood working industry.
- 8.2 Instructors will provide a safe working/learning environment for all students.

### **Sample Lesson Plan (using backward planning model)**

**Standard to be taught:** A3.3 Maintain and care for portable power and pneumatic tools

**Assessment:**

1. Student will demonstrate proper maintenance techniques resulting in proper operation of the tool

**Teaching Strategies:**

1. Lecture
2. Demonstration
3. Guided practice

**Student Activity:**

1. Replace damaged plug on power drill

**Resources:**

1. Electrical equipment repair manual and technical information

**Committee Members:**

Melinda Hall	Director of Curriculum & Instruction	Curriculum & Instruction
Joanne Durkee	Director, Adult Education	Adult Education
Spoogmai Habibi	Curriculum Specialist	Curriculum and Instruction
Tom Towbridge	Teacher Woodworking/Construction	Concord High School
Steve Seaman	Teacher Woodworking/Construction	Mt. Diablo High School
Terry Toliver	Teacher Woodworking	Ygnacio Valley High School
Paul Meyer	Teacher Woodworking	Clayton Valley High School