Wood Manufacturing Technology

Program of Studies

2015-2016

Learning that works for Kentucky

CTE™

Office of Career and Technical Education
Kentucky Department of Education

Wood Manufacturing Technology

Program Area Course Title	Post-Secondary Connection	Valid Course Code	Recommended Grade Level				Recommended Credit
			9	10	11	12	
Advanced Wood Processing	WMT 290	480733		X	X	X	1
Cabinet Making Technology	WMT 240	480731		X	X	X	1
CAD for Wood Technology		480725		X	X	X	1
Intro to Computer Aided Drafting	CAD 100	480110	X	X	X	X	1
Co-op I (Wood)	WMT 199	480741			X	X	1
Furniture Technology	WMT 250	480721		X	X	X	1
Internship (Wood)	WMT 198	480744			X	X	1 - 3
Introduction to Panel Processing	WMT 230	480711		X	X	X	1
Lumber Grading and Drying	WMT 200	480716		X	X	X	1
Millwork Technology	WMT 260	480717		X	X	X	1
Special Problems (for Wood Manufacturing)	IEX 291	480795			X	X	1
Technical Drawing and Blueprint Reading	WMT 110	480719		X	X	X	.5
Wood Finishing	WMT 160	480720		X	X	X	.5
Wood Product Manufacturing	WMT 120	480740	X	X	X	X	1

Last revised May 15, 2015

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Overview of Wood Manufacturing Technology

Purpose
The Wood Manufacturing Technology Program is designed to enhance the student's future by providing them with a broad range of specialized skills. Student's mastering the technical knowledge and skills required can be industry certified through Woodworking Career Alliance.

The Wood Manufacturing Technology Program prepares students by engaging them with science, mathematics, and critical thinking skills through the classroom and lab/shop training.

Wood Manufacturing Technology Education will:

- Operate as the venue for nationally recognized industry standard training.
- Provide a critical link in school to employment or postsecondary education.
- Develop stronger relationships with the community in terms of mutual advocacy, cooperative field experiences, employment placement, and support for relevant student organizations and competitions.
- Represent an important component in the education of all students.
- Require and promote critical thinking and problem solving.
- Offer an up to date curriculum based on standards that adapt to changes in the industry.
- Integrate academic skills to insure that students develop written and verbal communications skills, computational skills, and scientific/math problem-solving skills.

Career Pathways

- *Automated Wood Processer*
- *Cabinetmaker*
- *Furniture Maker*
- *Millworker*
- *Wood CNC Operator Programmer*
- *Wood Manufacturing TRACK*

Standards Based Curriculum
The Wood Manufacturing Curriculum is composed of standards-based competencies. All Wood Manufacturing programs incorporate industry and common core standards thus increasing the student's qualifications toward successful employment.

Alignment of the Wood Manufacturing curriculum with nationally recognized industry standards and the common core standards provides optimal preparation for students to acquire an industry certification.

Communities understand that this preparation provides better career opportunities for students and the demands of today's workforce for the 21st century.

Kentucky Occupational Skill Standards
The Kentucky Occupational Skill Standards are the performance specifications that identify the knowledge, skills, and abilities an individual needs to succeed in the workplace. Identifying the

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necessary skills is critical to preparing students for entry into employment or postsecondary education. These standards describe the necessary occupational, academic, and employability skills needed to enter the workforce or post-secondary education in specific career areas. There is an ongoing effort to continue to refine these standards by which exemplary Career and Technical Education Programs are evaluated and certified. This helps insure that curriculum meets industry specifications.

2014 – 2015 Valid Industry Certification and KOSSA List

Work Based Learning
Cooperative experience, internships, shadowing and mentoring opportunities provide depth and breadth of learning in the instructional program and allow students to apply the concepts learned in the classroom. The Work Based Learning Manual is available on the KDE webpage: www.education.ky.gov.

Student Organizations and Competitions
Participation in SkillsUSA competitions provides a vehicle for students to employ higher order thinking skills, interact with high-level industry representatives and enhance leadership skills through participation in regional, state and national competitive events and activities.

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WOOD MANUFACTURING CAREER PATHWAYS
2015-2016

AUTOMATED WOOD PROCESSER
CIP 48.0703.01

PATHWAY DESCRIPTION: Adjusts, sets up, aligns, cleans machines and performs minor repairs; secures wood into place and sets saws to produce specified sizes of plank and board to be cut; starts machines and feeds stock onto cutting saws, and operates automatic feeding mechanisms; raises and lowers saws to trim boards and remove defects such as rot and splits; controls lathes and slicing machines to produce veneers, and laminates veneers using glue; verifies dimensions of cut stock and accuracy of cuts; checks saws and other machines for safety, sharpness and correct functioning.

BEST PRACTICE CORE	EXAMPLE ILP-RELATED CAREER TITLES
Foundational Skills Necessary for Career-Ready Measure: (KOSSA/Industry Certification) *Complete **(3) THREE CREDITS:*** • 480110 Introduction to Computer Aided Drafting • 480740 Wood Product Manufacturing • 480711 Introduction to Panel Processing *Choose **(1) ONE CREDIT** from the following:* • 480733 Advanced Wood Processing • 480725 CAD for Wood Technology* • 480720 Wood Finishing* • 480721 Furniture Technology • 480716 Lumber Grading and Drying • 480719 Technical Drawing and Blueprint Reading* • 219901 Introduction to Engineering Design ***(PLTW)*** • 480741 Co-op I (Wood) OR 480744 Internship (Wood) Note: (PLTW) courses require an agreement between Project Lead the Way and the Local School District. Note: (*) Indicates half-credit (.5) course	Production Woodworker Machine Setter Cabinet Maker Millworker CNC Operator Wood Product Supervisor Furniture Maker Wood Technologist Wood Product Engineer

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WOOD MANUFACTURING CAREER PATHWAYS
2015-2016

CABINETMAKER
CIP 48.0703.02

PATHWAY DESCRIPTION: Cabinet makers are specific types of woodworkers who create and install cabinets in bathrooms, kitchens, other areas of homes and businesses. Typical duties of cabinet makers include designing custom cabinets, making cabinets, installing cabinetry, consulting with clients and other duties as needed. Cabinet makers are responsible for cutting and shaping wood, preparing surfaces and forming a completed product.

BEST PRACTICE CORE	EXAMPLE ILP-RELATED CAREER TITLES
Foundational Skills Necessary for Career-Ready Measure: (KOSSA/Industry Certification) *Complete **(3) THREE CREDITS:*** • 480719 Technical Drawing and Blueprint Reading* AND 480720 Wood Finishing* • 480740 Wood Product Manufacturing • 480731 Cabinet Making Technology *Choose **(1) ONE CREDIT** from the following:* • 480733 Advanced Wood Processing • 480725 CAD for Wood Technology* • 480721 Furniture Technology • 480110 Introduction to Computer Aided Drafting • 480716 Lumber Grading and Drying • 219901 Introduction to Engineering Design ***(PLTW)*** • 480741 Co-op I (Wood) OR 480744 Internship (Wood) Note: (PLTW) courses require an agreement between Project Lead the Way and the Local School District. Note: (*) Indicates half-credit (.5) course	Production Woodworker Machine Setter Millworker CNC Operator Wood Product Supervisor Furniture Maker Wood Technologist Wood Product Engineer

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WOOD MANUFACTURING CAREER PATHWAYS
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FURNITURE MAKER
CIP 48.0703.03

PATHWAY DESCRIPTION: Furniture makers are specific types of woodworkers who design and create furniture for homes and businesses. Typical duties of furniture makers include designing custom furniture, making furniture, and consulting with clients to meet their specifications. Furniture makers are responsible for cutting and shaping wood, preparing surfaces and forming a completed product.

BEST PRACTICE CORE	EXAMPLE ILP-RELATED CAREER TITLES
Foundational Skills Necessary for Career-Ready Measure: (KOSSA/Industry Certification) *Complete **(3) THREE CREDITS:*** • 480719 Technical Drawing and Blueprint Reading* AND 480720 Wood Finishing* • 480740 Wood Product Manufacturing • 480721 Furniture Technology *Choose **(1) ONE CREDIT** from the following:* • 480733 Advanced Wood Processing • 480725 CAD for Wood Technology* • 480110 Introduction to Computer Aided Drafting • 480716 Lumber Grading and Drying • 219901 Introduction to Engineering Design ***(PLTW)*** • 480741 Co-op I (Wood) OR 480744 Internship (Wood) Note: (PLTW) courses require an agreement between Project Lead the Way and the Local School District. Note: (*) Indicates half-credit (.5) course	Production Woodworker Machine Setter Cabinet Maker Millworker CNC Operator Wood Product Supervisor Wood Technologist Wood Product Engineer

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WOOD MANUFACTURING CAREER PATHWAYS
2015-2016

MILLWORKER
CIP 48.0703.04

PATHWAY DESCRIPTION: Furniture makers are specific types of woodworkers who design and create furniture for homes and businesses. Typical duties of furniture makers include designing custom furniture, making furniture, and consulting with clients to meet their specifications. Furniture makers are responsible for cutting and shaping wood, preparing surfaces and forming a completed product.

BEST PRACTICE CORE	EXAMPLE ILP-RELATED CAREER TITLES
Foundational Skills Necessary for Career-Ready Measure: (KOSSA/Industry Certification) *Complete **(3) THREE CREDITS:*** • 480719 Technical Drawing and Blueprint Reading* AND 480720 Wood Finishing* • 480716 Lumber Grading and Drying • 480717 Millwork Technology *Choose **(1) ONE CREDIT** from the following:* • 480733 Advanced Wood Processing • 480725 CAD for Wood Technology* • 480110 Introduction to Computer Aided Drafting • 480740 Wood Product Manufacturing • 480721 Furniture Technology • 219901 Introduction to Engineering Design ***(PLTW)*** • 480741 Co-op I (Wood) OR 480744 Internship (Wood) Note: (PLTW) courses require an agreement between Project Lead the Way and the Local School District. Note: (*) Indicates half-credit (.5) course	Production Woodworker Machine Setter Cabinet Maker CNC Operator Wood Product Supervisor Furniture Maker Wood Technologist Wood Product Engineer

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WOOD MANUFACTURING CAREER PATHWAYS
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WOOD CNC OPERATOR/PROGRAMMER
CIP 48.0703.05

PATHWAY DESCRIPTION: CNC Operators and Programmers set up, program, operate, or tend computerized or manual woodworking machines, such as drill presses, lathes, shapers, routers, sanders, planers, or wood-nailing machines to produce parts from a variety of materials. They must monitor operation of machines and make adjustments to correct problems and ensure conformance to specifications. They must be proficient using inspection tooling (i.e., micrometers, calipers, gages) to accurately measure part features.

BEST PRACTICE CORE	EXAMPLE ILP-RELATED CAREER TITLES
Foundational Skills Necessary for Career-Ready Measure: (KOSSA/Industry Certification) *Complete **(3) THREE CREDITS:*** • 480719 Technical Drawing and Blueprint Reading* AND 480720 Wood Finishing* • 480110 Introduction to Computer Aided Drafting • 480733 Advanced Wood Processing *Choose **(1) ONE CREDIT** from the following:* • 480716 Lumber Grading and Drying • 480717 Millwork Technology • 480733 Advanced Wood Processing • 480725 CAD for Wood Technology* • 480740 Wood Product Manufacturing • 480721 Furniture Technology • 219901 Introduction to Engineering Design ***(PLTW)*** • 480741 Co-op I (Wood) OR 480744 Internship (Wood) Note: (PLTW) courses require an agreement between Project Lead the Way and the Local School District. Note: (*) Indicates half-credit (.5) course	Production Woodworker Machine Setter Cabinet Maker Millworker Wood Product Supervisor Furniture Maker Wood Technologist Wood Product Engineer

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WOOD MANUFACTURING CAREER PATHWAYS
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WOOD MANUFACTURING TRACK
CIP 48.0500.99

PATHWAY DESCRIPTION: The Wood Manufacturing TRACK is designed as a pre-apprenticeship pathway for technical students to enter industry. Through the collaboration of local industry, technical school, program instructor, student and parents, a pre-apprenticeship agreement is signed. Local industry chooses 4 courses related to the required skills that will prepare the student to enter a four year apprenticeship sponsored by the company. Upon graduation the student under the discretion of the company; may be awarded reduced apprenticeship time or start at a higher wage.

BEST PRACTICE CORE	EXAMPLE ILP-RELATED CAREER TITLES
Foundational Skills Necessary for Career-Ready Measure: (KOSSA/Industry Certification) *Complete* ***(4) FOUR CREDITS:*** • (4)- Core courses chosen from the Wood Manufacturing valid course list by the company sponsoring a State Registered Apprenticeship.	Production Woodworker Machine Setter Cabinet Maker Millworker CNC Operator Wood Product Supervisor Furniture Maker Wood Technologist Wood Product Engineer

The Tech Ready Apprentices for Careers in Kentucky (*TRACK*) pre-apprenticeship program is a partnership between The Kentucky Department of Education's Office of Career and Technical Education and The Kentucky Labor Cabinet to provide pre-apprenticeship career pathway opportunities into registered apprenticeship programs to secondary students. This is a business and industry driven program to create a pipeline for students to enter post-secondary apprenticeship training.

Upon successful completion, the student will be awarded an industry certification by the employer or training organization through The Kentucky Labor Cabinet and all on-the-job hours worked will be counted towards the apprenticeship, if applicable. The certification will also count towards the local school district's college and career ready accountability index.

The specifics of the TRACK program vary and interested parties will need to confer with the Office of Career and Technical Education for the implementation process. There are no costs involved except wages for the student employee. The employer must have a registered apprenticeship program with The Kentucky Labor Cabinet. For more information, please refer to: http://education.ky.gov/CTE/cter/Pages/TRACK.aspx

As career pathways continue to expand, the ultimate rationale is that if an employer is willing to implement a Registered Apprenticeship program, a pipeline at the secondary level can be developed utilizing the TRACK program.

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COMPLEMENTARY OR ADVANCED COURSEWORK BEYOND WOOD MANUFACTURING PATHWAY(s)
Upon completion of a pathway, additional coursework to enhance student learning is encouraged. Credits earned in Advanced or Complementary Coursework "Beyond the Pathway" may not be substituted for pathway courses in order to achieve Preparatory or Completer status.
• 480795 Special Problems (for Wood Manufacturing)
• Career Options
• JAG Courses

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KENTUCKY CAREER PATHWAY/PROGRAM OF STUDY TEMPLATE

COLLEGE/UNIVERSITY: Morehead State University
Kentucky Community and Technical College
HIGH SCHOOL (S): Lincoln County ATC

CLUSTER: Maufacturing
PATHWAY: Wood Technologist/Manufactuirng Manager
PROGRAM: Wood Manufacturing

	GRADE	ENGLISH	MATH	SCIENCE	SOCIAL STUDIES	REQUIRED COURSES RECOMMENDED ELECTIVE COURSES OTHER ELECTIVE COURSES CAREER AND TECHNICAL EDUCATION COURSES			CREDENTIAL CERTIFICATE DIPLOMA DEGREE	SAMPLE OCCUPATIONS
SECONDARY	9	English I	Algebra I	Earth Science	Economics	History and Appreciation of Visual and Performing Arts	WMT 120 Wood Product Manufacturing 480740	WMT 110 Tech Draw/ Blueprint Reading 480719/480720		
	10	English II	*See Construction Geometry	Biology	U.S. History	WMT 100 Intro to CAD 480110	WMT 230 Intro to Panel Processing 480711	WMT 215 Lumber Grading and Drying 480716	Wood Career Alliance (Green Credential)	Cabinetmaker Helper Furnituremaker Helper
	11	English III	Algebra II	Physical Science	World Geography	WMT 250 Furniture Technology 480721	WMT 240 Cabinet Making Technology 480731	WMT 260 Millwork T	Wood Career Alliance (Green Credential)	Cabinet Maker Furniture Maker
	12	English IV	4th Math			WMT199 Coop I	WMT 299 Co-op II	WMT199 Co-op I & V	TRACK Pre-Apprenticeship / High School Diploma	Wood CNC Operator/Programmer
		Take ACT - Apply for admission to KCTCS							*ONet Certificates	
POSTSECONDARY	Year 13	Writing	Math	Science	Computer Applications	EFM 100 Personal Financial Management	ISX 100 Industrial Safety	WMT 290 Advanced Millwork Technology		
	Year 14	Communications	Math	Humanities	Social Interaction	WMT 280 Estimating	WPP 200 Workplace Principles	CAD 200 Intermediate CAD	Wood Technologist Diploma	Wood Technologist
		Apply for admission to Morehead State University								
	Year 15	Communications	Humanities	Psychology	Economics	IET 330 Industrial Design	IET 319 Quality Control	IET 327 Applied Industrial Management		
	Year 16	Arts and Humanities	Math	Science	Material Properties and Testing	IET 317 Time and Motion Study	IET 300 Technology and Society	IET 320 Supervisory Practices	Bachelor's Degree	Manufacturing Manager

CCTI College and Career Transitions Initiative

Funded by the U. S. Departm
(V051B020001)
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Required Courses
Recommended Elective Courses
Other Elective Courses
Career and Technical Education Courses
Credit-Based Transition Programs (e.g. Dual/Concurrent Enrollment, Articulated Courses, 2+2+2)
(◆=High School to Comm. College) (• =Com. College to 4-Yr Institution) (■ = Opportunity to test out)
Mandatory Assessments, Advising, and Additional Preparation

Note: Categories of courses (e.g. Required, Recommended Electives, other Electives and career and Technical Education) apply to both secondary and postsecondary levels.

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Advanced Wood Processing
Valid Course Code: 480733

Course Description: This course is a capstone experience for advanced wood processing technicians involving the integration of computer aided design and world-class manufacturing of wood products.

Content/Process

Students will:

1. Practice and perform safe shop procedures at all times.
2. Apply the technical math required for employment opportunities.
3. Perform all duties with emphasis on integrity, responsibility, quality, discipline and teamwork.
4. Identify the basic parts of a CNC machining center.
5. Describe the career opportunities and job titles in CNC.
6. Identify the tasks that must be done to put a job into production.
7. Describe the tasks in the CNC process.
8. Identify standard and auxiliary axes on routers and boring machines using the "Right Hand Rule".
9. Describe the characteristics of and differences between position and reference points.
10. Calculate coordinate points using absolute Cartesian values.
11. Calculate coordinate points using incremental Cartesian values.
12. Locate and select coordinate values for reference points.
13. Identify data storage media in CNC.
14. Identify the components of a CNC system.
15. List the special features of CNC.
16. Select the tooling for a CNC job.
17. Select and use appropriate holding tools.
18. Perform routine maintenance.
19. Load code into the control of CNC machining center.
20. Align and coordinate the machine and tools.
21. Enter tool offsets and cutter geometry.
22. Test and run a program.
23. Write an operator setup document.
24. Select speeds and feeds for the type of tool and material to be machined.
25. Plan an efficient and safe program with good sequencing.
26. Identify proprietary differences in "G" and "M" codes.
27. Use the basic coded words in the program.

Connections

- Common Core Technical Standards
- CTSO - SkillsUSA
- KOSSA
- New Generation Science Standards
- KCTCS Course: WMT 290
- WCA Industrial Standards

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Cabinet Making Technology
Valid Course Code: 480731

Course Description: This course is an overview of the cabinet and store fixture industries. Emphasis will be placed on the design and construction of face frame as well as frameless (32mm) systems. Students will plan and build a vanity, kitchen cabinet, or shop project which utilizes contemporary casework techniques.

Prerequisites: Technical Drawing and Blueprint Reading - 480719
Wood Product Manufacturing - 480740

Content/Process

Students will:

1. Practice and perform safe shop procedures at all times.
2. Apply the technical math required for employment opportunities.
3. Perform all duties with emphasis on integrity, responsibility, quality, discipline and teamwork.
4. Produce working drawings for a typical set of kitchen cabinets, both manually and with the aid of computer software.
5. Produce a cutting list needed to build a set of cabinets.
6. Demonstrate an understanding of both face and frame and 32mm systems of cabinet construction.
7. Identify standardized cabinet dimensions.
8. Differentiate between custom cabinetry and modular/mass-produced cabinetry.
9. Compare the cost of manufacturing components (doors and drawers) vs outsourcing.
10. Identify trade associations for the cabinet and store fixture industries and review standards and certification programs.
11. Manufacture a countertop using high pressure decorative laminate.
12. Fabricate a typical cabinetry project.
13. Install a typical base and wall cabinet.
14. Solve first-degree algebra equations.
15. Apply algebraic knowledge to solve verbal problems and formulas.
16. Solve simple plan and solid geometry problems.
17. Prepare a surface/product for the finishing process.
18. Identify the factors associated with finish quality of a wood product.
19. Differentiate between paints, varnish, lacquer, shellac, polyurethane, conversion varnish, and water-based products.
20. Demonstrate contemporary application techniques for both oil-based and water-based products.
21. Explain the theory and operation of various coating technologies.
22. Disassemble, re-assemble, and adjust a conventional spray gun.
23. Develop a finishing schedule for a variety of finishing materials applied to a variety of substrates.
24. Describe EPA and OSHA regulations as they pertain to the finishing industry.
25. Evaluate and specify drying equipment, fluid handling equipment, and exhaust/filtering systems.
26. Perform standardized tests on finished surfaces to determine durability.

Connections

- Common Core Standards

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- Common Core Technical Standards
- CTSO - SkillsUSA
- KOSSA
- New Generation Science Standards
- KCTCS Course: WMT 240
- WCA Industrial Standards

FINAL DRAFT

CAD for Wood Technology
Valid Course Code: 480725

Course Description: This course is designed for the fundamental principles and capabilities of CAD, basic drafting conventions and operations that are relative to the Wood Manufacturing Industry.

Content/Process

Students will:

1. Practice and perform safe shop procedures at all times.
2. Apply the technical math required for employment opportunities.
3. Perform all duties with emphasis on integrity, responsibility, quality, discipline and teamwork.
4. Produce line entities using various coordinate techniques.
5. Construct geometric shapes in two-dimensional space.
6. Develop detailed orthographic views as required.
7. Construct cross sections of various designs, with cross-hatching incorporated as desired.
8. Apply dimensions and annotations to drawings.
9. Move, copy, delete, and save drawings or portions of drawings.
10. Explore 3-D drawing techniques.

Connections

- Common Core Standards
- Common Core Technical Standards
- CTSO - SkillsUSA
- KOSSA
- New Generation Science Standards
- WCA Industrial Standards

FINAL DRAFT

Intro to Computer Aided Drafting
Valid Course Code: 480110

Course Description: Uses computer graphic workstation in the application of fundamental principles and capabilities of CAD, basic drafting conventions, and operations. An in-depth study of computer aided drafting commands, terminology, command utilization, and skill development.

Content/Process

Students will:

1. Practice and perform safe shop procedures at all times.
2. Apply the technical math required for employment opportunities.
3. Perform all duties with emphasis on integrity, responsibility, quality, discipline and teamwork.
4. Describe, using correct computer terminology, basic computer functions, uses of computers in society and different types of software.
5. Discuss ethical computing issues, such as copyright, privacy, security, and property.
6. Use graphical user interface.
7. Use computer application programs.
8. Access information sources found on networks such as the Internet and gain experience with Web browsers, search sources, and sources of information related to his or her own field.
9. Demonstrate an awareness of different types of software applications.
10. Produce line entities using various coordinate techniques.
11. Construct geometric shapes in two-dimensional space.
12. Develop detailed orthographic views as required.
13. Construct cross sections of various designs, with cross-hatching incorporated as desired.
14. Apply dimensions and annotations to drawings.
15. Move, copy, delete, and save drawings or portions of drawings.
16. Use CAD to manipulate drawings by means of translation, rotation, scaling, zooming, panning, and windowing.
17. Explore 3-D drawing techniques.

Connections

- Common Core Standards
- Common Core Technical Standards
- CTSO - SkillsUSA
- KOSSA
- New Generation Science Standards
- KCTCS Course: CAD 100
- WCA Industrial Standards

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Cooperative Education I (for Wood)
Valid Course Code: 480741

Course Description: Cooperative Education provides supervised on-the-job work experience related to the student's educational objectives. Students participating in the Cooperative Education program receive compensation for their work.

Prerequisites: Consent of the Instructor

Content/Process

Students will:

1. Practice and perform safe shop procedures at all times.
2. Apply the technical math required for employment opportunities.
3. Perform all duties with emphasis on integrity, responsibility, quality, discipline and teamwork.
4. Gain career awareness and the opportunity to test career choice(s).
5. Receive work experience related to career interests.
6. Integrate classroom studies with work experience.
7. Receive exposure to facilities and equipment unavailable in a classroom setting.
8. Increase employability potential.
9. Earn funds to help with education expenses.

Connections

- Common Core Standards
- Common Core Technical Standards
- CTSO - SkillsUSA
- KOSSA
- New Generation Science Standards
- KCTCS Course: WMT 199
- WCA Industrial Standards

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Furniture Technology
Valid Course Code: 480721

Course Description: Furniture design principles, structural considerations, joinery, fasteners, veneering, and use of specialized machines for complex operations are the focus of this course. Students will plan and build a piece of furniture which includes at least one drawer, a door and some veneering.

Prerequisites: Technical Drawing and Blueprint Reading - 480719
Wood Product Manufacturing - 480740

Content/Process

Students will:

1. Practice and perform safe shop procedures at all times.
2. Apply the technical math required for employment opportunities.
3. Perform all duties with emphasis on integrity, responsibility, quality, discipline and teamwork.
4. Analyze a piece of furniture for "good design" qualities.
5. Interpret working drawings and visualize the construction techniques.
6. Design a furniture project which allows for expansion and contraction of the wood using solid wood, plywood, veneer, or frame and panel construction techniques.
7. Identify, evaluate and specify traditional and contemporary construction techniques.
8. Calculate machine rates, set-up times, yields, and other production control elements.
9. Set-up and operate industrial woodworking equipment to perform common operations.
10. Evaluate a given production problem, formulate a plan of action and execute the plan to a satisfactory conclusion.
11. Develop skills related to the efficient operation of a rough mill, machine room and an assembly area.
12. Fabricate a piece of furniture which lends itself to specified production techniques.
13. Identify equipment capabilities and determine sequencing of operations.
14. Solve first-degree algebra equations.
15. Apply algebraic knowledge to solve verbal problems and formulas.
16. Solve simple plane and solid geometry problems.
17. Prepare a surface/product for the finishing process.
18. Identify the factors associated with finish quality of a wood product.
19. Differentiate between paints, varnish, lacquer, shellac, polyurethane, conversion varnish, and water-based products.
20. Demonstrate contemporary application techniques for both oil-based and water-based products.
21. Explain the theory and operation of various coating technologies.
22. Disassemble, re-assemble, and adjust a conventional spray gun.
23. Develop a finishing schedule for a variety of finishing materials applied to a variety of substrates.
24. Describe EPA and OSHA regulations as they pertain to the finishing industry.
25. Evaluate and specify drying equipment, fluid handling equipment, and exhaust/filtering systems.
26. Perform standardized tests on finished surfaces to determine durability.

Connections

- Common Core Standards

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- Common Core Technical Standards
- CTSO - SkillsUSA
- KOSSA
- New Generation Science Standards
- KCTCS Course: WMT 250
- WCA Industrial Standards

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Internship (Wood)
Valid Course Code: 480744

Course Description: The Internship provides supervised on-the-job work experience related to the student's educational objectives. Students participating in the Internship do not receive compensation.

Prerequisite: Consent of the Instructor

Content/Process

Students will:

1. Practice and perform safe shop procedures at all times.
2. Apply the technical math required for employment opportunities.
3. Perform all duties with emphasis on integrity, responsibility, quality, discipline and teamwork.
4. Gain career awareness and the opportunity to test career choice(s).
5. Receive work experience related to career interests.
6. Integrate classroom studies with work experience.
7. Receive exposure to facilities and equipment unavailable in a classroom setting.
8. Increase employability potential.

Connections

- Common Core Standards
- Common Core Technical Standards
- CTSO - SkillsUSA
- KOSSA
- New Generation Science Standards
- KCTCS Course: WMT 198
- WCA Industrial Standards

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Introduction to Panel Processing
Valid Course Code: 480711

Course Description: This course provides an overview of the terminology, materials, processing equipment and related software utilized by panel processing manufacturers of residential and commercial case work. Emphasis will be placed on the design and fabrication of frameless cabinetry to the use of panel saws, edge banders, CNC boring equipment, and case clamps.

Content/Process

Students will:

1. Practice and perform safe shop procedures at all times.
2. Apply the technical math required for employment opportunities.
3. Perform all duties with emphasis on integrity, responsibility, quality, discipline and teamwork.
4. Identify commercial and residential applications for panel materials.
5. Explain industry trends and panel processing equipment capabilities and techniques.
6. Identify, evaluate, and specify joinery and assembly techniques.
7. Operate various types of software for designing, cutting, and optimization for efficient use of panel goods.
8. Specify quality and quantity of materials required to fabricate frameless case work.
9. Properly layout component panels utilizing the 32mm system.
10. Set up and operate common panel processing equipment including a panel saw, edge bander, boring machine, and case clamp in a cellular manufacturing environment.
11. Generate basic machine codes and programs for running machine centers.
12. Fabricate a typical frameless piece of case work.
13. Develop and perform routine preventive maintenance on the panel saw, edgebander, boring machine, and the case clamp.
14. Develop an understanding of the different tooling requirements while working on various panel products.
15. Apply work site and lab safety procedures.
16. Apply personal safety rules and procedures.
17. Apply fire prevention rules and procedures.
18. Apply first aid procedures.
19. Explain how to obtain first aid certification.
20. Demonstrate hazardous communication procedures.
21. Describe and demonstrate universal precaution procedures.
22. Solve first-degree algebra equations.
23. Apply algebraic knowledge to solve verbal problems and formulas.
24. Solve simple plane and solid geometry problems.

Connections

- Common Core Standards
- Common Core Technical Standards
- New Generation Science Standards
- Woodworkers Career Alliance (WCA)
- KCTCS Course: WMT 230
- CTSO - SkillsUSA
- KOSSA

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Lumber Grading and Drying
Valid Course Code: 480716

Course Description: This course prepares an individual to master the National Hardwood Lumber Association's rules for grading hardwoods and to apply those rules in a production setting. Students will identify species and use a deductive process to grade the lumber and assign it a monetary value. Students will also be introduced to hardwood lumber drying systems. Conventional dry kilns, dehumidification, vacuum, and solar kilns are illustrated. Current theories on drying lumber to minimize defects and increase quality are demonstrated. Computer controls are explained.

Content/Process

Students will:

1. Practice and perform safe shop procedures at all times.
2. Apply the technical math required for employment opportunities.
3. Perform all duties with emphasis on integrity, responsibility, quality, discipline and teamwork.
4. Use First Aid and perform CPR.
5. Describe basic lumber economics.
6. Identify woods by physical characteristics.
7. Describe career opportunities in the wood industry.
8. List the job titles in the wood industry.
9. Calculate the unit of "board feet".
10. Define cutting, clear-faced cutting, and sound cutting.
11. Calculate the percentage of clear wood in the clear-face cutting grades.
12. Identify requirements for the standard grade of "Firsts and Seconds".
13. Identify requirements for the standard grade of "FASIF".
14. Identify requirements for the standard grade of "#1 Common".
15. Identify requirements for the standard grade of "#2A Common".
16. Identify requirements for the standard grade of "#2B Common".
17. Identify requirements for the standard grade of "#3A Common".
18. Identify requirements for the standard grade of "#3B Common".
19. Identify requirements for the standard grade of "Selects".
20. Measure using a lumber rule.
21. Apply grading practices.
22. Apply safety techniques when operating a dry kiln.
23. Identify the basic components of a lumber dry kiln.
24. Identify types of dry kilns.
25. Apply sample selection techniques in preparation for loading.
26. Calculate the moisture content of samples/sections.
27. Calculate the oven-dried weight of samples.
28. Calculate the moisture of a sample.
29. Construct a drying schedule for a particular species and thickness.
30. Apply a drying schedule in a lab kiln for species and thickness.
31. Discuss the economics of equality versus time considerations when drying lumber.
32. Apply accelerated drying schedules.
33. Maintain drying records and charts.

Connections

- Common Core Standards
- Common Core Technical Standards

FINAL DRAFT

- CTSO - SkillsUSA
- KOSSA
- New Generation Science Standards
- KCTCS Course: WMT 200
- WCA Industrial Standards

FINAL DRAFT

Millwork Technology
Valid Course Code: 480717

Course Description: Design of molding, doors, and door frames; windows; stairs; and mantels are the focus of this course. Emphasis will be placed on construction principles, joinery, and fasteners for millwork assemblies. Students will build one or more millwork items.

Prerequisites: Technical Drawing and Blueprint Reading - 480719
Wood Product Manufacturing - 480740

Content/Process

Students will:

1. Practice and perform safe shop procedures at all times.
2. Apply the technical math required for employment opportunities.
3. Perform all duties with emphasis on integrity, responsibility, quality, discipline and teamwork.
4. Interpret architectural prints and shop drawings.
5. Define the three levels utilized in the Architectural Woodworking Institute's Quality Standards.
6. Conduct field measurements of projects in process to verify dimensions.
7. Identify typical stock and custom millwork projects and products.
8. Select a profile, design a template, grind the knives, install the tooling, set-up the molder, run the stock, and troubleshoot the machine.
9. Calculate feed rates needed to meet AWI specifications for millwork.
10. Fabricate one or more millwork products to a specified quality level.
11. Recognize the common sizes, types, and construction techniques used to manufacture doors, windows, and stair parts.
12. Prepare a finishing sample which reflects AWI premium grade specifications.
13. Prepare a take-off and an estimate from a set of architectural plans.
14. Sharpen cutters on an abrasive wheel or stone.

Connections

- Common Core Standards
- Common Core Technical Standards
- CTSO - SkillsUSA
- KOSSA
- New Generation Science Standards
- KCTCS Course: WMT 260
- WCA Industrial Standards

FINAL DRAFT

Special Problems (Wood)
Valid Course Code: 480795

Course Description: Allows the student to gain intermediate experience in their perspective fields through projects and tasks assigned by the instructor and based on applications the student may one day experience as a professional. Sets the foundation for more in-depth projects that will be included in the student's future portfolio. Focuses on various assignments and curriculum as determined by the program instructor
Content/Process
Students will: 1. Practice and perform safe shop procedures at all times. 2. Apply the technical math required for employment opportunities. 3. Perform all duties with emphasis on integrity, responsibility, quality, discipline and teamwork. 4. Expand their portfolio of CAD drawings to enhance career opportunities. 5. Discuss occupation opportunities.
Connections
• Common Core Standards • Common Core Technical Standards • CTSO - SkillsUSA • KOSSA • New Generation Science Standards • KCTCS Course: IEX 291 • WCA Industrial Standards

FINAL DRAFT

Technical Drawing and Blueprint Reading
Valid Course Code: 480719

Course Description: Fundamentals of multiview and pictorial drafting techniques; and reading and interpreting architectural, furniture, and cabinet drawings are the focus of this course. Students will apply blueprint reading skills by preparing materials and cutting lists for actual job.

Content/Process

Students will:

1. Practice and perform safe shop procedures at all times.
2. Apply the technical math required for employment opportunities.
3. Perform all duties with emphasis on integrity, responsibility, quality, discipline and teamwork.
4. Develop freehand sketching techniques used to convey object size and shape.
5. Use and care for drafting equipment and supplies properly.
6. Layout and draw orthographic, sectional, isometric, oblique, and perspective drawings.
7. Read and interpret specifications from architectural plans and detail drawings.
8. Practice industry standards for dimensioning and notation.
9. Master basic geometric construction concepts and techniques.
10. Utilize the design process to develop a solution to a problem.
11. Prepare a bill of materials for a typical wood product by performing a materials take-off from an architectural drawing.
12. Create drawings needed for route sheets, subassembly, and final assembly sheets.

Connections

- Common Core Standards
- Common Core Technical Standards
- CTSO - SkillsUSA
- KOSSA
- New Generation Science Standards
- KCTCS Course: WMT 110
- WCA Industrial Standards

FINAL DRAFT

Wood Finishing
Valid Course Code: 480720

Course Description: This course is an overview of contemporary spray finishing materials and processes for millwork assemblies. Students will learn to set up and troubleshoot a variety of common finishing systems while experimenting with finishing materials and supplies.

Content/Process

Students will:

1. Practice and perform safe shop procedures at all times.
2. Apply the technical math required for employment opportunities.
3. Perform all duties with emphasis on integrity, responsibility, quality, discipline and teamwork.
4. Prepare a surface/product for the finishing process.
5. Identify the factors associated with finish quality of a wood product.
6. Differentiate between paints, varnish, lacquer, shellac, polyurethane, conversion varnish, and water based products.
7. Demonstrate contemporary application techniques for both oil based and water based products.
8. Explain the theory and operation of various coating technologies.
9. Disassemble, re-assemble, and adjust a conventional spray gun.
10. Develop a finishing schedule for a variety of finishing materials applied to a variety of substrates.
11. Describe EPA and OSHA regulations as they pertain to the finishing industry.
12. Evaluate and specify drying equipment, fluid handling equipment, and exhaust/filtering systems.
13. Perform standardized tests on finished surfaces to determine durability.
14. Apply work site and lab safety procedures.
15. Apply personal safety rules and procedures.
16. Apply fire prevention rules and procedures .
17. Apply first aid procedures.
18. Explain how to obtain first aid certification.
19. Demonstrate hazardous communication procedures.
20. Describe and demonstrate universal precaution procedures.

Connections

- Common Core Standards
- Common Core Technical Standards
- CTSO - SkillsUSA
- KOSSA
- New Generation Science Standards
- KCTCS Course: WMT 160
- WCA Industrial Standards

FINAL DRAFT

Wood Product Manufacturing
Valid Course Code: 480740

Course Description: Fundamentals of wood processing and an overview of the secondary wood processing industry are covered in this course. The nature of wood, material selection, terminology, safe setup, and operation of common woodworking equipment will be discussed. Students will fabricate a wood product while being introduced to custom woodworking techniques as well as mass production concepts related to product engineering.

Content/Process

Students will:

1. Practice and perform safe shop procedures at all times.
2. Apply the technical math required for employment opportunities.
3. Perform all duties with emphasis on integrity, responsibility, quality, discipline and teamwork.
4. Discuss the characteristics of wood as a building material.
5. Specify and order lumber, veneer, plywood, particleboard, fiberboard, laminates, composite materials, hardware, and related materials and supplies.
6. Identify common species of hardwoods and softwoods.
7. Observe all safety rules and regulations when using hand tools, portable electric tools, and stationary machines.
8. Practice safe setup and operation of woodworking equipment.
9. Master basic jig and fixture design and development concepts.
10. Develop common production planning materials, route sheets, subassembly sheets and final assembly sheets.
11. Evaluate and specify appropriate joinery when assembling two or more components.
12. Describe the properties of common thermosetting and thermoplastic adhesives and the most appropriate application techniques for each.
13. Select and utilize common abrasive materials for surface preparation of the wood.
14. Apply work site and lab safety procedures.
15. Apply personal safety rules and procedures.
16. Apply fire prevention rules and procedures.
17. Apply first aid procedures.
18. Explain how to obtain first aid certification.
19. Demonstrate hazardous communications procedures.
20. Describe and demonstrate universal precaution procedures.
21. Set up and solve ratios and proportions.
22. Convert between various units of measure.
23. Solve problems involving significant digits and accuracy and precision of measurements.
24. Perform mathematical operations with standard and metric measurement systems.

Connections

- Common Core Standards
- Common Core Technical Standards
- CTSO - SkillsUSA
- KOSSA
- New Generation Science Standards
- KCTCS Course: WMT 120
- WCA Industrial Standards

FINAL DRAFT