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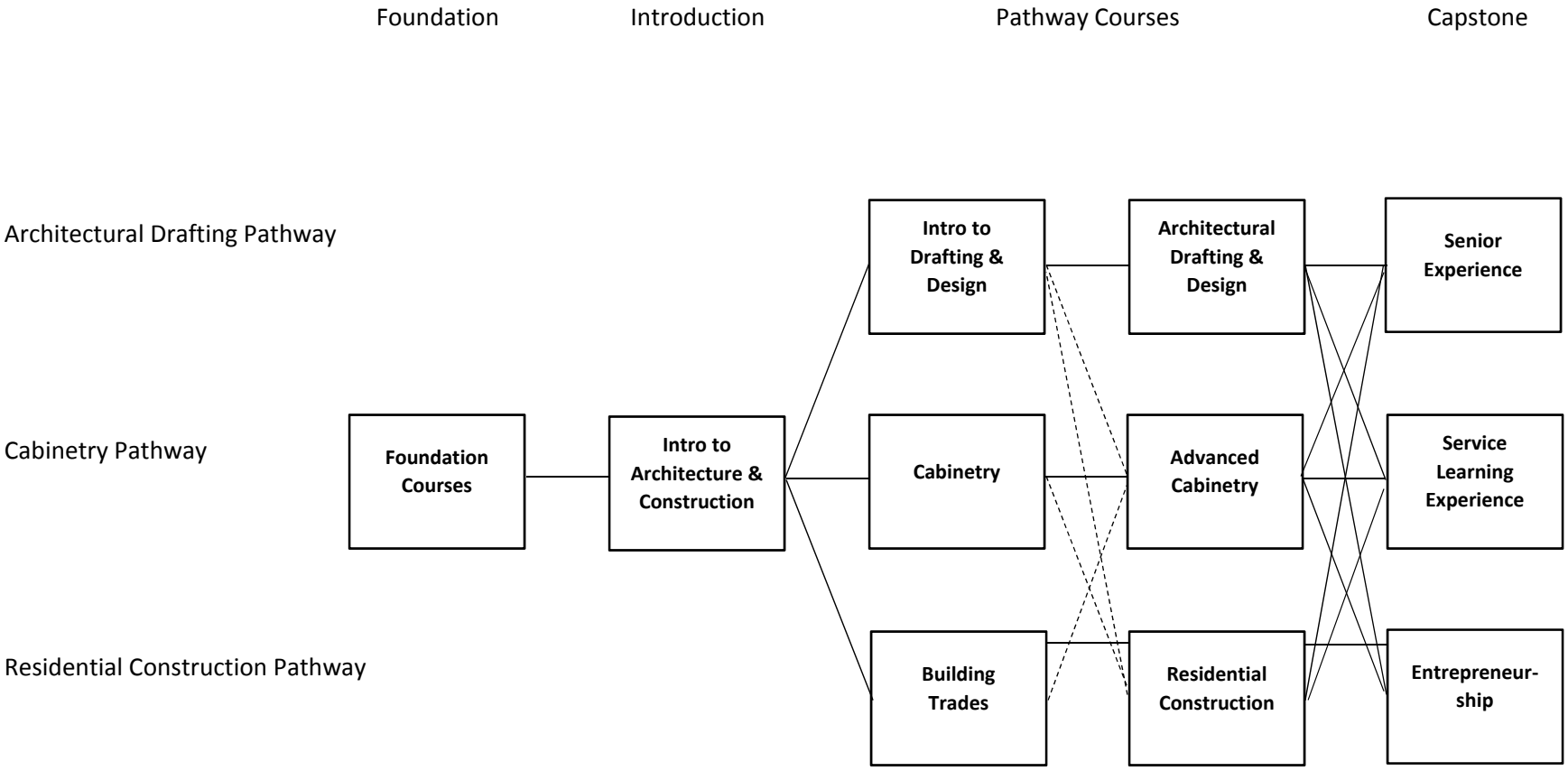
Architecture and Construction Pathways



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Introduction to Architecture and Construction

Career Cluster	Architecture and Construction
Course Code	17006
Prerequisite(s)	None
Credit	.5
Program of Study and Sequence	Intro to Architecture and Construction is the recommended prerequisite for the three career pathways in Architecture and Construction: 1) Architectural Drafting Pathway 2) Cabinetry Pathway, and 3) Residential Construction Pathway
Student Organization	SkillsUSA
Coordinating Work-Based Learning	Tours, guest speakers, job shadowing
Industry Certifications	None
Dual Credit or Dual Enrollment	None
Teacher Certification	SD Teachers License with and Endorsement in Building Trades or Technical Education
Resources	None

Course Description:

This course will prepare students to delve into the architecture and construction industry. It covers all three construction career pathways offered, including architecture/drafting along with cabinetry and building construction. Students will explore many different topics where they will be able to complete hands on activities to enhance the learning process.

Program of Study Application

Intro to Architecture and Construction is the recommended prerequisite for the three career pathways in Architecture and Construction:

- Architectural Drafting Pathway
- Cabinetry Pathway
- Residential Construction Pathway

Course Standards

Indicator# IAC 1 Explore the different career opportunities involved in the architecture and construction industries.

Webb Level	*Sub-indicator*	*Integrated Content*
Two Apply	IAC 1.1 Compare career possibilities in the drafting industry. Examples: • Using SDMyLife career discovery to explore all drafting careers • Visiting the Occupational Outlook Handbook to explore drafting careers	
Two Apply	IAC 1.2 Investigate and examine career opportunities in cabinetry industry Examples: • Using SDMyLife career discovery to explore all cabinetry careers • Visiting the Occupational Outlook Handbook to explore cabinetry careers	
Two Apply	IAC 1.3 Research career opportunities in the architecture and construction fields. Examples: • Using SDMyLife career discovery to explore all Architecture and construction careers • Visiting the Occupational Outlook Handbook to explore drafting careers	

Notes

Indicator# IAC 2 Introduce safety concepts in the architecture and construction industries.

Webb Level	*Sub-indicator*	*Integrated Content*
Two Apply	IAC 2.1 Apply general shop safety principles	NCCER Core Basic Safety Module 00101-09
One Identify	IAC 2.2 Identify job site and career safety concepts	
One Define	IAC 2.3 Define OSHA (Occupational Safety Health Administration) and its role in the construction industries	
Two Apply	IAC 2.4 Apply general hand and power tool safety procedures	NCCER Core Introduction to Hand Tools Module 00103-09 NCCER Core Introduction to Power Tools Module 00104-09

Notes

Indicator# IAC 3 Apply basic math principles used in the architecture and construction industries.

Webb Level	*Sub-indicator*	*Integrated Content*
Two Demonstrate	IAC 3.1 Demonstrate proper use of appropriate math skills Examples: • Addition, subtraction, multiplication and division of fractions • Calculate distance, area, volume	NCCER Core Introduction to Construction Math Module 00102-09
Two Demonstrate	IAC 3.2 Demonstrate proper measuring and layout skills Examples: • Read a tape/ruler to the 16^{th} inch • Display working knowledge of decimal conversions • Demonstrate use of the metric system	

Notes

Indicator# IAC 4 Recognize the materials used in the architecture and construction industries.

Webb Level	*Sub-indicator*	*Integrated Content*
One Identify	IAC 4.1 Identify wood species and engineered building materials. Examples: • Hardwood, softwoods • Panel materials, concrete materials, metal materials, plastics, etc.	
One Recognize	IAC 4.2 Recognize proper application of fasteners, adhesives, and hardware. Examples: • Screws, glues, nails • General hardware • Hangers, straps, gussets, etc.	
One Explore	IAC 4.3 Explore new upcoming materials used in building industry.	

Notes:

Indicator# IAC 5 Examine Basic drafting skills used in architecture and construction.

Webb Level	*Sub-indicator*	*Integrated Content*
One Recognize	IAC 5.1 Recognize basic drafting terms and abbreviations	
Two Differentiate	IAC 5.2 Differentiate between different drafting styles Example: • Board and hand drafting vs Computer Aided Drafting (CAD)	
Two Demonstrate	IAC 5.3 Identify different aspects of blueprints/project plans to show a working knowledge of specifications.	NCCER Core Introduction to Construction Drawings Module 00105-09
Two Classify	IAC 5.4 Classify the different styles of residential architectural structures Example: • Colonial, ranch, modern, Victorian, etc.	

Notes:

Indicator# IAC 6 Display skills needed in architecture and construction industries.

Webb Level	*Sub-indicator*	*Integrated Content*
Two Apply	IAC6.1 Apply proper measuring and cutting techniques to perform job related tasks	
Two Display	IAC 6.2 Display a working knowledge of tools and equipment used in the industry Examples: • Use of proper hand tools for specific tasks • Use of powered hand tools for job related tasks • Use of stationary equipment to saw, shape, sand, etc. • Use of pneumatic tools for fastening, sanding, etc.	NCCER Core Introduction to Hand Tools Module 00103-09 NCCER Core Introduction to Power Tools Module 00104-09
Two Construct	IAC 6.3 Construct a project using the assigned design process Examples: • Classify the materials used for the project • Identify the joinery methods and assembly • Create a finished project	
Two Demonstrate	IAC 6.4 Demonstrate necessary job skills needed in architecture and construction industries Examples: • Attendance and punctuality • Positive attitude • Positive work ethic • Use of proper social skills • Display ability to work as part of team and take direction from others	NCCER Core Basic Communication Skills Module 00107-09 NCCER Core Employability Skills Module 00108-09

Notes:

Introduction to Drafting and Design

Career Cluster	Architecture & Construction
Course Code	21102
Prerequisite(s)	Algebra I and Geometry Recommended
Credit	.5
Program of Study and Sequence	Introduction to Drafting and Design is an introductory course in the Architectural Drafting, Cabinetry, and Residential Construction Pathways
Student Organization	SkillsUSA
Coordinating Work-Based Learning	Tours, guest speakers, job shadowing
Industry Certifications	This course provides instruction toward attainment of ADDA Apprentice Drafting certification
Dual Credit or Dual Enrollment	TBD
Teacher Certification	Drafting, Technology Education
Resources	

Course Description:

People with careers in design and pre-construction create our future. They turn a concept into a set of plans whether for a component, a system, or a building. Their plans guide other construction or manufacturing professionals as they continue the building process. This course will expose students to the American Design Drafting Association (ADDA) Apprentice standards in both mechanical and architectural drafting. The desire for this course is for the students to receive industry based training at the basic level before taking either the Mechanical or Architectural drafting courses. It is highly recommend that students have taken Algebra I and Geometry before taking this course.

Program of Study Application

Introduction to Drafting and Design is an introductory course in the Architectural Drafting and Design/Pre-Construction Pathways. This course follows foundational CTE courses, and is designed to prepare individuals to participate successfully in pathway courses in the Design/Pre-Construction, Construction, or Maintenance/Operations pathways.

Course Standards

Indicator # IDD 1 Examine basic drafting terminology and equipment.

Webb Level	*Sub-indicator*	*Integrated Content*
One Recognize	IDD 1.1 Recognize basic drafting terms and abbreviations.	ADDA Apprentice Drafting Competencies: Mechanical #1
Two Differentiate	IDD 1.2 Differentiate basic drafting tools and their uses.	ADDA Apprentice Drafting Competencies: Mechanical #2, Architecture #2

Notes:

Indicator # IDD 2 Apply basic math skills to design work.

Webb Level	*Sub-indicator*	*Integrated Content*
Two Apply	IDD 2.1 Apply algebraic and trigonometric formulas used in drafting and design.	ADDA Apprentice Drafting Competencies: Mechanical #13, Architecture #5 Reinforces SD Common Core math standard 8.F.5. Analyze functions using different representations
Two Understand	IDD 2.2 Understand the various drawing scales used in drafting.	

Notes:

Indicator # IDD 3 Examine basic drafting fundamental and technical skills

Webb Level	*Sub-indicator*	*Integrated Content*
Three Integrate	IDD 3.1 Integrate symbols, lettering and Geometric shapes used on technical drawings.	
One Illustrate	IDD 3.2 Illustrate line types recommended by American National Standards Institute (ANSI).	
One Define	IDD 3.3 Define dimensioning styles and techniques on metric and imperial drawings.	

Notes:

Indicator # IDD 4 Apply drawing techniques to produce various technical plans.

Webb Level	*Sub-indicator*	*Integrated Content*
Four Create	IDD 4.1 Create orthographic projections	
Four Create	IDD 4.2 Create isometric and pictorial drawings.	May include geometric construction to align with state math standards

Notes:

Indicator # IDD 5 Implement computer aided software into design work.

Webb Level	*Sub-indicator*	*Integrated Content*
One Identify	IDD 5.1 Identify CAD skills and applications of technical design.	
Two Apply	IDD 5.2 Apply CAD defaults and preferences to set up a drawing.	
Four Generate	IDD 5.3 Generate drawings and projections using CAD software.	

Notes:

Indicator # IDD 6 Explore career-ready practices.

Webb Level	*Sub-indicator*	*Integrated Content*
One Understand	IDD 6.1 Understand professional drafting practices in the workplace and communication skills.	
Two Compare	IDD 6.2 Compare career possibilities in the drafting industry.	

Notes:

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Introduction to Architecture and Construction

Career Cluster	Architecture and Construction
Course Code	17006
Prerequisite(s)	None
Credit	.5
Program of Study and Sequence	Intro to Architecture and Construction is the recommended prerequisite for the three career pathways in Architecture and Construction: 1) Architectural Drafting Pathway 2) Cabinetry Pathway, and 3) Residential Construction Pathway
Student Organization	SkillsUSA
Coordinating Work-Based Learning	Tours, guest speakers, job shadowing
Industry Certifications	None
Dual Credit or Dual Enrollment	None
Teacher Certification	SD Teachers License with and Endorsement in Building Trades or Technical Education
Resources	None

Course Description:

This course will prepare students to delve into the architecture and construction industry. It covers all three construction career pathways offered, including architecture/drafting along with cabinetry and building construction. Students will explore many different topics where they will be able to complete hands on activities to enhance the learning process.

Program of Study Application

Intro to Architecture and Construction is the recommended prerequisite for the three career pathways in Architecture and Construction:

- Architectural Drafting Pathway
- Cabinetry Pathway
- Residential Construction Pathway

Course Standards

Indicator# IAC 1 Explore the different career opportunities involved in the architecture and construction industries.

Webb Level	*Sub-indicator*	*Integrated Content*
Two Apply	IAC 1.1 Compare career possibilities in the drafting industry. Examples: • Using SDMyLife career discovery to explore all drafting careers • Visiting the Occupational Outlook Handbook to explore drafting careers	
Two Apply	IAC 1.2 Investigate and examine career opportunities in cabinetry industry Examples: • Using SDMyLife career discovery to explore all cabinetry careers • Visiting the Occupational Outlook Handbook to explore cabinetry careers	
Two Apply	IAC 1.3 Research career opportunities in the architecture and construction fields. Examples: • Using SDMyLife career discovery to explore all Architecture and construction careers • Visiting the Occupational Outlook Handbook to explore drafting careers	

Notes

Indicator# IAC 2 Introduce safety concepts in the architecture and construction industries.

Webb Level	*Sub-indicator*	*Integrated Content*
Two Apply	IAC 2.1 Apply general shop safety principles	NCCER Core Basic Safety Module 00101-09
One Identify	IAC 2.2 Identify job site and career safety concepts	
One Define	IAC 2.3 Define OSHA (Occupational Safety Health Administration) and its role in the construction industries	
Two Apply	IAC 2.4 Apply general hand and power tool safety procedures	NCCER Core Introduction to Hand Tools Module 00103-09 NCCER Core Introduction to Power Tools Module 00104-09

Notes

Indicator# IAC 3 Apply basic math principles used in the architecture and construction industries.

Webb Level	*Sub-indicator*	*Integrated Content*
Two Demonstrate	IAC 3.1 Demonstrate proper use of appropriate math skills Examples: • Addition, subtraction, multiplication and division of fractions • Calculate distance, area, volume	NCCER Core Introduction to Construction Math Module 00102-09
Two Demonstrate	IAC 3.2 Demonstrate proper measuring and layout skills Examples: • Read a tape/ruler to the 16^{th} inch • Display working knowledge of decimal conversions • Demonstrate use of the metric system	

Notes

Indicator# IAC 4 Recognize the materials used in the architecture and construction industries.

Webb Level	*Sub-indicator*	*Integrated Content*
One Identify	IAC 4.1 Identify wood species and engineered building materials. Examples: • Hardwood, softwoods • Panel materials, concrete materials, metal materials, plastics, etc.	
One Recognize	IAC 4.2 Recognize proper application of fasteners, adhesives, and hardware. Examples: • Screws, glues, nails • General hardware • Hangers, straps, gussets, etc.	
One Explore	IAC 4.3 Explore new upcoming materials used in building industry.	

Notes:

Indicator# IAC 5 Examine Basic drafting skills used in architecture and construction.

Webb Level	*Sub-indicator*	*Integrated Content*
One Recognize	IAC 5.1 Recognize basic drafting terms and abbreviations	
Two Differentiate	IAC 5.2 Differentiate between different drafting styles Example: • Board and hand drafting vs Computer Aided Drafting (CAD)	
Two Demonstrate	IAC 5.3 Identify different aspects of blueprints/project plans to show a working knowledge of specifications.	NCCER Core Introduction to Construction Drawings Module 00105-09
Two Classify	IAC 5.4 Classify the different styles of residential architectural structures Example: • Colonial, ranch, modern, Victorian, etc.	

Notes:

Indicator# IAC 6 Display skills needed in architecture and construction industries.

Webb Level	*Sub-indicator*	*Integrated Content*
Two Apply	IAC6.1 Apply proper measuring and cutting techniques to perform job related tasks	
Two Display	IAC 6.2 Display a working knowledge of tools and equipment used in the industry Examples: • Use of proper hand tools for specific tasks • Use of powered hand tools for job related tasks • Use of stationary equipment to saw, shape, sand, etc. • Use of pneumatic tools for fastening, sanding, etc.	NCCER Core Introduction to Hand Tools Module 00103-09 NCCER Core Introduction to Power Tools Module 00104-09
Two Construct	IAC 6.3 Construct a project using the assigned design process Examples: • Classify the materials used for the project • Identify the joinery methods and assembly • Create a finished project	
Two Demonstrate	IAC 6.4 Demonstrate necessary job skills needed in architecture and construction industries Examples: • Attendance and punctuality • Positive attitude • Positive work ethic • Use of proper social skills • Display ability to work as part of team and take direction from others	NCCER Core Basic Communication Skills Module 00107-09 NCCER Core Employability Skills Module 00108-09

Notes:

Architectural Drafting and Design

Career Cluster	Architecture & Construction
Course Code	21103
Prerequisite(s)	Introduction to Drafting and Design
Credit	.5
Program of Study and Sequence	Foundation Courses, Introduction to Architecture and Construction, Introduction to Drafting and Design, Architectural Drafting and design, Capstone Course
Student Organization	SkillsUSA
Coordinating Work-Based Learning	Job Shadowing, Mentorships, Service Learning, Internships, Apprenticeship
Industry Certifications	ADDA Architectural Apprentice certification http://www.adda.org
Dual Credit or Dual Enrollment	TBD
Teacher Certification	Drafting, Technology Education
Resources	None

Course Description:

People with careers in design and pre-construction create our future. They turn a concept into a set of plans whether for a component, a system or a building. The plans guide other construction or manufacturing professionals as they continue the building process. These standards, combined with the knowledge and skills students master in the Introduction to Drafting and Design course, will provide students the basis to sit for the ADDA (American Drafting and Design Association) Architectural Apprentice certification. Details of the ADDA competencies addressed in each standard can be found at http://www.adda.org.

Program of Study Application

This is the fourth course in the suggested sequence of the Architectural & Construction career cluster. It is recommended that it is preceded by (1) Foundation Courses, (2) Introduction to Architecture and Construction, and (3) Introduction to Drafting and Design; and followed by (5) Capstone Experience.

Course Standards

Indicator # ADD 1 Understand architectural design fundamentals and history.

Webb Level	*Sub-indicator*	*Integrated Content*
Level 1 Recall	ADD 1.1 Identify architectural products and styles. Examples • Describe historical influences that contributed to current home styles • Describe design elements of contemporary dwellings • Discuss current trends in architecture • List family needs that should be considered when planning a dwelling	• Understanding architectural products and construction styles will ensure quality architectural design. • ADDA Apprentice Drafting Competency met: Architecture #6
Level 2 Skill/ Concept	ADD 1.2 Interpret the fundamentals of framing plans. Examples: • Justify the components of a typical framed wall • Compare the different methods of frame wall construction • Interpret the information shown on a ceiling joist span data chart and trusses • Draw a typical wall section and full cross sections	• Understanding architectural products and construction styles will ensure quality architectural design. • ADDA Apprentice Drafting Competency met: Architecture #6
Level 2 Skill/ Concept	ADD 1.3 Identify building codes and governing bodies. Examples: • Apply the Uniform Building Code (UBC) to a residential design • Design a residence to meet the minimum FHA standards	• Understanding architectural products and construction styles will ensure quality architectural design. • ADDA Apprentice Drafting Competency met: Architecture #6
Level 1 Recall	ADD 1.4 Identify residential building materials Examples: • Evaluate the different siding types that will affect the design of a residence	• Understanding architectural products and construction styles will ensure quality architectural design. • ADDA Apprentice Drafting Competency met: Architecture #6

Notes:

Indicator # ADD 2 Understand drawing management, dimensioning, and notations.

Webb Level	*Sub-indicator*	*Integrated Content*
Level 2 Skill/ Concept	ADD 2.1 Examine drawing identification and management techniques used in architectural drafting. Examples: Analyze types and uses of architectural drawings	• Properly laid out drawings with the proper information are important to the design of a residence • ADDA Apprentice Drafting Competency met: Architecture #8
Level 3 Strategic Thinking	ADD 2.2 Illustrate proper dimensioning and notation practices used in architectural drafting. Examples: • Choose best location for dimensions • Apply uniform spacing between dimension lines • Fully dimension an object • Correctly use leaders and notes • Use appropriate angles for leaders • Use correct text height • Use architectural style letters and numerals	• Properly laid out drawings with the proper information are important to the design of a residence • ADDA Apprentice Drafting Competency met: Architecture #8

Notes:

Indicator # ADD 3 Develop a residential plot and foundation system plan.

Webb Level	*Sub-indicator*	*Integrated Content*
Level 4 Extended Thinking	ADD 3.1 Create a plot/site plan for a residence. Examples: • Draw a plot/site plan for a residence showing grade elevations against the home, lot contours and corners of the lot for drainage purposes • Show water, power, gas and sewer lines or septic system in plan • Show walks, driveways, patios, and other onsite improvements in plan • Show the relationship of the finished floor elevation and the finished grade around the home	• A properly designed plot/site plan is necessary to assist with subsequent drawings and laying out a residence on a given site. • ADDA Apprentice Drafting Competency met: Architecture #7 • Acquire employability skills such as working on a team, problem-solving and organizational skills
Level 3 Strategic Thinking	ADD 3.2 Design footings and foundation for a residence. Examples: • Analyze major considerations when designing a footing for a residential foundation • Describe the procedure for staking out a house location • Analyze a typical floor plan to determine the appropriate foundation • Analyze design considerations for wood, concrete, and masonry foundation walls • Calculate the load to be supported by a beam • Draw a foundation plan for a residence	• A properly designed plot/site plan is necessary to assist with subsequent drawings and laying out a residence on a given site. • ADDA Apprentice Drafting Competency met: Architecture #7 • Acquire employability skills such as working on a team, problem-solving and organizational skills

Notes:

Indicator # ADD 4 Generate the necessary construction plans to build a residence.

Webb Level	*Sub-indicator*	*Integrated Content*
Level 3 Strategic Thinking	ADD 4.1 Develop a floor plan using accepted symbols and techniques. Examples: • List information required on a typical floor plan • Represent typical materials using standard architectural symbols • Draw to scale a residential floor plan using accepted symbols and techniques • Draw dimensions of a floor plan in a clear and precise manner which complies with architectural standards • Recognize the difference between a good and poor drawing of a floor plan • Discuss accessibility requirements for functional utility	• A properly drawn floor plan is essential to developing your other architectural drawings. • ADDA Apprentice Drafting Competency met: Architecture #10
Level 3 Strategic Thinking	ADD 4.2 Prepare a working drawing of the residence HVAC, lights and electrical needs. Examples: • Draw electric and HVAC plans for all floors of an architectural design to comply with National Electrical Code (NEC) • Use correct architectural and national electrical code symbols • Show the correct location of smoke detectors according to code	• A properly drawn floor plan is essential to developing your other architectural drawings. • ADDA Apprentice Drafting Competency met: Architecture #10
Level 3 Strategic Thinking	ADD 4.3 Design a residential roof plan. Examples: • Identify issues associated with roof framing plans • Draw a roof plan	• A properly drawn floor plan is essential to developing your other architectural drawings. • ADDA Apprentice Drafting Competency met: Architecture #10

Level 2 Skill/ Concept	ADD 4.4 Understand the use of elevations in the design of a residence. Examples: • Identify items on elevations (columns & posts, outside material) • Identify the dimensions commonly shown on elevations • Illustrate symbols that are often found on elevations • Draw a typical exterior elevation which demonstrates proper techniques • Draw millwork elevations and special details for kitchen cabinets, bathroom cabinets, wardrobe & utility closet and cabinets	• A properly drawn floor plan is essential to developing your other architectural drawings. • ADDA Apprentice Drafting Competency met: Architecture #10
Level 3 Strategic Thinking	ADD 4.5 Draw interior and exterior stair details appropriate to those found in a residence. Examples: • Draw interior and exterior stair details appropriate to those found in a home that comply with applicable building codes • Show hand rails, guard rails and other safety features in a drawing • Use & label correct material in stair details	• A properly drawn floor plan is essential to developing your other architectural drawings. • ADDA Apprentice Drafting Competency met: Architecture #10

Level 3 Strategic Thinking	ADD 4.6 Develop door, window, and finishing schedules. Examples: • Draw a window schedule that would include window size, make, material, & type of glazing • Draw a door schedule that would include door size, style, type of lockset, special features, & jamb size • Draw a finish schedule that would include different types of wall & ceiling finishes, types of floor coverings, special wainscot wall finishes	• A properly drawn floor plan is essential to developing your other architectural drawings. • ADDA Apprentice Drafting Competency met: Architecture #10
Level 2 Skill/ Concept	ADD 4.7 Understand basic estimating practices used in the construction industry. Examples: • Perform basic math functions (area, square feet/square yard) • Calculate area of geometric shapes (triangle, square, rectangle • Determine heights • Add dimensions with mixed units • Convert from one unit to another • Determine square footage • Determine cubic yardage	• A properly drawn floor plan is essential to developing your other architectural drawings. • ADDA Apprentice Drafting Competency met: Architecture #10
Level 4 Extended Thinking	ADD 4.8 Generate final presentation drawings and three dimensional computer model. Examples: • Develop a 3D computer model of a design • Develop a presentation to sell a design to a specific audience	• A properly drawn floor plan is essential to developing your other architectural drawings. • ADDA Apprentice Drafting Competency met: Architecture #10

Notes:

Cabinetry

Career Cluster	Architecture and Construction
Course Code	17007
Prerequisite(s)	Introduction to Architecture and Construction
Credit	.5 – 1
Program of Study and Sequence	Cabinetry Sequence
Student Organization	SkillsUSA
Coordinating Work-Based Learning	Work place tours, Guest speakers
Industry Certifications	None
Dual Credit or Dual Enrollment	TBD
Teacher Certification	SD Teachers License with Technical Education or Building Trades endorsement
Resources	

Course Description:

This is course is designed to introduce the students to the basics of cabinetry. The course will stress safe and proper use of hand and power tools; safe shop practices and shop environment safety. Students will display a working knowledge of terms and techniques to design and build a wood working project.

Program of Study Application

Introduction to Architecture and Construction is recommended but not required

Cabinetry

Advanced Cabinetry

Capstone Experience

Course Standards

Indicator # C 1 Observe and apply rules and regulations to comply with personal and shop safety.

Webb Level	*Sub-indicator*	*Integrated Content*
Two Apply	C1.1 Apply hand/power tool and lab safety standards. Examples: • Identify proper safety procedures in the lab • Select materials to enhance hand/power tool and lab safety • Examine proper hand/power tool and lab safety	
One Describe	C1.2 Describe and wear appropriate personal protective equipment (PPE) when needed. Examples: • Eye protection • Ear protection • Impact Hat	
One Indicate	C1.3 Indicate a knowledge of government regulations regarding health and safety in the shop. Examples: • Handle, use and store chemicals according to MSDS/SDS sheets • Apply fire safety rules and procedures	Occupational Safety Health Administration (OSHA), Environmental Protection Agency (EPA), Department of Environment and Natural Resources (DENR)

Notes:

Indicator # C 2 Explore the different career opportunities in the industry.

Webb Level	*Sub-indicator*	*Integrated Content*
Three Investigate	2.1 Investigate and examine career opportunities in cabinetry industry Examples: • Research cabinetry jobs in the area • Examine educational requirements and job descriptions	
Two Demonstrate	2.2 Demonstrate an understanding of necessary job skills needed in cabinetry careers Examples: • Attendance and punctuality • Positive attitude • Positive work ethic • Use of proper social skills • Display ability to work as part of team and take direction from others	

Notes:

Indicator # C 3 Apply basic math principles used in the industry.

Webb Level	*Sub-indicator*	*Integrated Content*
Two Demonstrate	3.1 Demonstrate proper use of appropriate math skills Examples: • Addition, subtraction, multiplication and division of fractions • Calculate distance, area, volume	
Two Demonstrate	3.2 Demonstrate an understanding of the difference between board feet and linear feet	
Two Demonstrate	3.3 Demonstrate proper measuring and layout skills Examples: • Read a tape/ruler to $1/16^{th}$ inch • Display working knowledge of decimal conversions • Demonstrate use of the metric system	

Notes:

Indicator # C 4 Identify various materials and apply project planning.

Webb Level	*Sub-indicator*	*Integrated Content*
One Identify	4.1 Identify wood species and engineered materials. Examples: • Hardwoods and softwoods • Plywood, Particle board, Medium Density Fiberboard, etc.	
Three Analyze	4.2 Analyze design elements of a project plan Examples: • Recognize how components of a plan are assembled	
Four Create Implement	4.3 Create and implement a bill of materials and cut list from a project drawing	
One Identify	4.4 Identify various types of hardware, fasteners, and adhesives used in the cabinetry industry Examples: • Screws, nails, glues, etc. • Drawer glides, hinges, pulls/knobs, etc.	

Notes:

Indicator # C 5 Recognize various cabinetry joinery and assembly techniques.

Webb Level	*Sub-indicator*	*Integrated Content*
Two Demonstrate	5.1 Demonstrate common joinery techniques Examples: • Butt, miter, lap, dado, rabbit, tongue and grove etc. • Pock Hole, biscuit, dowel	
Two Demonstrate Assemble	5.2 Demonstrate knowledge of industry concepts to assemble projects Examples: • Gluing, clamping and squaring • Applying proper fastening techniques	

Notes:

Indicator # C 6 Recognize and apply surface preparation and finishing techniques.

Webb Level	*Sub-indicator*	*Integrated Content*
Two Apply	6.1 Apply surface preparation techniques Examples: • Select and use appropriate abrasive types and grit sizes • Select proper surface preparation tools	
Two Apply	6.2 Apply finishing products Examples: • Stain, pigments and paints • Top coats (polyurethane, lacquer, varnish)	

Notes:

Advanced Cabinetry

Career Cluster	Architecture and Construction
Course Code	17013
Prerequisite(s)	Cabinetry
Credit	.5-1
Program of Study and Sequence	Foundation Courses, Introduction to Architecture & Construction, Cabinetry, Advanced Cabinetry, Capstone Experience
Student Organization	SkillsUSA
Coordinating Work-Based Learning	Service Learning; Work Place Tours; Job Shadowing
Industry Certifications	None
Dual Credit or Dual Enrollment	TBD
Teacher Certification	SD Teachers License with Technical Education or Building Trades endorsement
Resources	

Course Description:

This course prepares individuals to apply technical knowledge and skills to set up and operate industrial woodworking machinery. Students will use industrial machinery to design and fabricate custom cabinets and architectural millwork. This course will cover safe use of hand and power tools and machinery used in the production of cabinets and millwork. A variety of cabinets will be designed and constructed. Students will apply proper finishing and explore proper installation techniques as part of this program.

Program of Study Application

Foundation courses
Intro to architecture and construction (Recommended not required)
Cabinetry (prerequisite)
Advanced Cabinetry
Capstone Experience

Course Standards

Indicator # AC 1 Demonstrate proper rules and regulations to comply with personal and shop safety.

Webb Level	*Sub-indicator*	*Integrated Content*
One Apply	AC 1.1 Apply hand/power/industrial tool and lab safety practices. Example: • Determine cause and effect for common shop safety related situations • Recall basic hand and power tool safety from previous courses • Use proper industrial tool safety e.g. computer numeric control (CNC) and other industrial shop tools	
Two Determine	AC 1.2 Determine and wear appropriate personal protective equipment (PPE) Examples: • Eye protection • Ear protection • Impact hat	
One Comply	AC 1.3 Comply with government regulations regarding health and safety in the shop. Examples: • Handle, use and store chemicals according to MSDS/SDS sheets • Apply fire safety rules and procedures	Occupational Safety Health Administration (OSHA), Environmental Protection Agency (EPA), Department of Environment and Natural Resources (DENR)

Notes:

Indicator # AC 2 Evaluate the career market that surrounds the cabinetry industry.

Webb Level	*Sub-indicator*	*Integrated Content*
Three Acquire	2.1 Acquire career information and demonstrate knowledge of the career-planning process Examples: • Apply decision-making skills to career planning, course selection and career transitions in cabinetry • Describe traditional and nontraditional career choices and how they relate to cabinetmaking	ASCA National standards for career development Standard B1 SD MyLife
Three Identify	2.2 Identify individual career goals in the cabinetry industry. Examples: • Demonstrate awareness of the education and training needed to achieve career goals • Use employability and job readiness skills in internship, mentoring, shadowing and/or other work experience	ASCA National standards for career development Standard B2 SD MyLife
Three Develop	2.3 Enhance the development of employment readiness skills Examples: • Attendance, punctuality • Dependability, integrity and effort in the workplace • Social skills, team work and problem-solving and organizational skills • Communication skills	ASCA National standards for career development Standard B2 SD MyLife

Notes:

Indicator # AC 3 Utilize advanced math skills, formulas, and principles used in cabinetry.

Webb Level	*Sub-indicator*	*Integrated Content*
Two Apply	AC 3.1 Apply geometric formulas to determine areas of various structures Examples: • Calculate areas and volumes of structures • Estimate materials and supplies	Architecture and Construction Career Cluster Knowledge and Skill Statement ACC01.01.02
Two Apply	AC 3.2 Apply appropriate formulas to determine percentages/decimals Examples: • Calculate percentages and decimals • Use percentage/decimals to perform measurement tasks	Architecture and Construction Career Cluster Knowledge and Skill Statement ACC01.01.03
Two Apply	AC 3.3 Apply appropriate formulas to determine ratios, fractions, and proportion measures Examples: • Calculate linear feet, square feet, and board feet • Calculate ratio, fraction, and proportion measures • Use ratios, fractions, and proportion measures to perform measure tasks	Architecture and Construction Career Cluster Knowledge and Skill Statement ACC01.01.04
Three Apply	AC 3.4 Apply appropriate formulas to determine measurement of dimensions, spaces, and structures Examples: • Measure dimensions, spaces, and materials using US Standard units • Measure dimensions, spaces, and materials using metric units • Use dimension and space calculations to estimate materials and supplies needed	Architecture and Construction Career Cluster Knowledge and Skill Statement ACC01.01.05

Four Develop Conceptualize	AC 3.5 Develop a model that shows the conceptual understanding of a three-dimensional form from a two-dimensional drawing Example: • Build or create three-dimensional form models	Architecture and Construction Career Cluster Knowledge and Skill Statement ACC01.01.06
One Define	AC 3.6 Define the X,Y,Z coordinates involved in common Computer numeric control (CNC) applications Examples: • Utilize G-code operations in CNC • Design and create models in three dimensions	Option: visit CNC cabinetry operation

Notes:

Indicator # AC 4 Identify various materials and evaluate the proper application in project planning.

Webb Level	*Sub-indicator*	*Integrated Content*
Three Differentiate	AC 4.1 Differentiate various cabinetry materials and their appropriate applications Examples: • Distinguish between hardwoods, softwoods and engineered materials • Identify different species of hardwoods and softwoods • Identify grain patterns and color compatibility	
Two Identify	AC 4.2 Identify the common grades of lumber and sheet goods Examples: • Selects, #1, AC, etc. • FAS, rough cut lumber, S1S, S2S, etc.	
Two Describe	AC 4.3 Describe and identify natural defects in woods Examples: • Warp, twist, cup, bow, knots, cracks, and checks	
One Utilize	AC 4.4 Utilize proper storage and handling techniques Examples: • Proper moisture maintenance • Stacking	

Notes:

Indicator # AC 5 Demonstrate advanced skills and techniques used in industry.

Webb Level	*Sub-indicator*	*Integrated Content*
Two Determine	AC 5.1 Determine plumb, level, and square	
Two Determine	AC 5.2 Demonstrate proper techniques used in various sawing, shaping, carving, molding, and routing applications.	
Three Apply Fabricate	AC 5.3 Apply fabricating techniques of various cabinet parts Examples: • Face frames • Drawers • Doors • Carcass	
Three Differentiate	AC 5.4 Differentiate between different styles in cabinets, doors, and drawers Examples: • Euro • Traditional • Raised panel • Mission stile • Flat panel	

One Identify	AC 5.5 Identify and create the basic wood and mechanical joints used in cabinetry. Examples: • Butt • Miter • Rabbet • Dado • Spline • Mortise and tenon • Dovetail • Groove (plough) • Lap • Pocket • Blind dado	

Notes:

Indicator # AC 6 Demonstrate the use of cabinet fasteners and hardware.

Webb Level	*Sub-indicator*	*Integrated Content*
Two Determine	AC 6.1 Determine proper application and use of mechanical fasteners and adhesives Examples: • Screws, nails, plugs, RTA connectors, etc. • Glue types (yellow, polyurethane, epoxy, etc.)	
Two Analyze	AC 6.2 Analyze different hinge systems and their applications Examples: • European, piano, butt, etc.	
Two Analyze	AC 6.3 Analyze various drawer glides and their appropriate applications	

Notes:

Indicator # AC 7 Demonstrate proper assembly and finish preparation techniques.

Webb Level	*Sub-indicator*	*Integrated Content*
Two Develop	AC 7.1 Develop logical assembly process/procedure Example: • Clamping • Squaring • Fastening	
Two Demonstrate	AC 7.2 Demonstrate various ways to remove excess adhesive Example: • Sanding, chiseling, taping, etc.	
Two Apply	AC 7.3 Apply surface preparation skills before finishing Examples: • Select proper abrasives and sanding equipment • Fillers	

Notes:

Indicator # AC 8 Demonstrate the use of finishing materials and processes.

Webb Level	*Sub-indicator*	*Integrated Content*
One Explain	AC 8.1 Explain the purpose and applications of various types of finishes and finishing processes Examples: • Wood fillers • Stains, varnishes, pigments, and paints	
Three Develop	AC 8.2 Develop and follow a finishing schedule	
Two Apply	AC 8.3 Utilize safe and approved methods for cleanup and disposal (OSHA, EPA, DENR)	

Notes:

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Building Trades

Career Cluster	Architecture and Construction
Course Code	17002
Prerequisite(s)	Introduction to Architecture and Construction
Credit	.5
Program of Study and Sequence	Foundation Courses, Introduction to Architecture and Construction, Building Trades, Residential Construction, Capstone
Student Organization	SkillsUSA
Coordinating Work-Based Learning	This standard includes Workplace Tours, Service learning and Apprenticeship
Industry Certifications	None
Dual Credit or Dual Enrollment	TBD
Teacher Certification	Building Trades, Technology Education
Resources	

Course Description:

Students will gain insight into the career of building trades by developing practical skills such as safety on the jobsite, construction math, use of hand/power/pneumatic tools, basic residential blueprint reading, basic land surveying techniques, building construction, plumbing, electrical, concrete, employability skills and career exploration required to succeed in the construction industry.

Program of Study Application

This is the third course in the suggested sequence of the Residential Construction Program of Study. It is recommended that it is preceded by (1) Foundation Courses, (2) Introduction to Architecture and Construction, and followed by (4) Residential Construction and (5) Capstone Experience.

Indicator # BT 1 Understand and Apply Industry Safety Procedures

Webb Level	*Sub-indicator*	*Integrated Content*
Level 2 Skill/ Concept	BT1.1 Identify and demonstrate the proper industry safety standards. Examples: • Examine basic construction safety using Occupational Safety Health Administration (OSHA) standards or equivalents. • Demonstrate the use of protective clothing and safety equipment • Inspect and care for various types of personal protective equipment • Demonstrate basic first aid • Explain the function of Material Safety Data Sheets (MSDS) • Practice safe work procedures around electrical hazards • Explain and practice safe lockout/tag out procedures • Maintain a written portfolio record of written safety examinations and equipment examinations which the student has passed	OSHA Certification (Optional) for dual credit. Transfer portfolio records in their MyLife portfolio NCCER Core Basic Safety module 00101-09

Notes:

Indicator # BT 2 Utilize appropriate industry math skills and formulas

Webb Level	*Sub-indicator*	*Integrated Content*
Level 2 Skill/ Concept	BT2.1 Understand and demonstrate basic math skills and formulas. Examples: • Correctly read a tape measure to the nearest 1/16” • Add, subtract, multiply, and divide whole numbers with and without a calculator • Add, subtract, multiply, and divide fractions • Add, subtract, multiply, and divide decimals, with and without a calculator • Convert decimals to percent and percent to decimals • Convert fractions to decimals and decimals to fractions • Calculate the necessary unit of measure for a building project (examples: square inches/square feet, cubic inches/cubic feet)	Develop an awareness of personal abilities, skills, interests and motivations. NCCER Core Introduction to Construction Math module 00102-09

Notes:

Indicator # BT 3 Identify and correctly use appropriate hand, power, and pneumatic tools

Webb Level	*Sub-indicator*	*Integrated Content*
Level 2 Skill/ Concept	BT3.1 Demonstrate safe and proper use of hand tools. Examples: • Identify and report on the hand tools used in the construction trades • Demonstrate safe use of basic hand tools • Explain and demonstrate basic maintenance procedures for hand tools	Suggested Activities: Have a tool rep. visit the class NCCER Core Introduction to Hand Tools module 00103-09
Level 2 Skill/ Concept	BT3.2 Demonstrate safe and proper use of power tools. Examples: • Identify and report on the power tools used in the construction trades • Demonstrate safe use of power tools • Explain and demonstrate the procedures to properly maintain these power tools	Suggested Activities: Have a tool rep. visit the class NCCER Core Introduction to Power Tools module 00104-09
Level 2 Skill /Concept	BT3.3 Demonstrate safe and proper use of pneumatic tools. Examples: • Identify and report on the pneumatic tools used in the construction trades • Demonstrate safe use of pneumatic tools • Explain and demonstrate the procedures to properly maintain these pneumatic tools	Suggested Activities: Have a tool rep. visit the class NCCER Core Introduction to Power Tools module 00104-09

Notes:

Indicator # BT 4 Understand blueprint reading and perform basic survey techniques

Webb Level	*Sub-indicator*	*Integrated Content*
Level 3 Strategic Thinking	BT4.1 Demonstrate how to read blueprints. Examples: • Identify and recognize basic blueprint terms and symbols • Relate information on prints to real parts and locations	NCCER Core Introduction to Construction Drawings module 00105-09
Level 3 Strategic Thinking	BT4.2 Demonstrate basic survey techniques. Examples: • Define plot plan, building lines, care of instruments, layout and running lines • Demonstrate surveying a project	Acquire employability skills such as working on a team, problem-solving and organizational skills NCCER Core Basic Communication Skills module 00107-09 NCCER Core Basic Employability Skills module 00108-09

Notes:

Indicator # BT 5 Apply basic organizational, spatial, structural and construction principles of carpentry

Webb Level	*Sub-indicator*	*Integrated Content*
Level 3 Strategic Thinking	BT 5.1 Demonstrate the understanding of the building process by the building of a construction project. Examples: • Complete a construction of a utility shed from reading and understanding the blueprint to finishing the roof system and painting the project. • Build a small scale model home • Construct a community service project (Example: wheel chair ramp)	Acquire employability skills such as working on a team, problem-solving and organizational skills NCCER Core Basic Communication Skills module 00107-09 NCCER Core Basic Employability Skills module 00108-09

Notes:

Indicator # BT 6 Study principles, standards and applications of plumbing

Webb Level	*Sub-indicator*	*Integrated Content*
Level 1 Recall	BT6.1 Define safety procedures for plumbing Examples: • Explain the classes of fires and the type(s) of extinguishers used for each • Show proper procedures for soldering which is common in the plumbing industry	Invite a career professional to visit and explain the use of plans for a structure The student will learn how to interact and work cooperatively as a team member on a survey crew NCCER Introduction to the Plumbing Profession Plumbing Safety module 02102-12
Level 2 Skill/ Concept	BT6.2 Distinguish pipe sizes, fittings, adapters, and coupling. Examples: • Explain uses of different plumbing materials • Interpret code for different plumbing situations	Learn to make decisions NCCER Introduction to the Plumbing Profession Plastic Pipe and Fittings module 02106-12 NCCER Introduction to the Plumbing Profession Copper Tube and Fittings module 02107-12

Level 3 Strategic Thinking	BT6.3 Demonstrate the use of plumbing materials. Examples: • Select methods to properly thread pipe • Make use of plumbing materials to build a bathroom mock-up • Illustrate procedures of proper soldering and pipe fitting	Invite a career professional to visit and explain pipe fittings and plumbing layout The student will learn how to interact and work cooperatively as a team member

Notes:

Indicator # BT 7 Employ basic knowledge and methods of electrical wiring

Webb Level	*Sub-indicator*	*Integrated Content*
Level 1 Recall	BT7.1 Select electrical materials considering safety. Examples: • Identify basic codes of electrical wiring • Interpret proper and improper electrical connections	Learn to make decisions NCCER Orientation to the Electrical Trade Electrical Safety module 26102-14 NCCER Orientation to Electrical Trade Introduction to the National Electrical Code module 26105-14
Level 2 Skill/ Concept	BT7.2 Identify electrical materials. Examples: • Distinguish wire size, capacities, and characteristics • Classify conductors and other electrical materials	Learn to make decisions NCCER Orientation to the Electrical Trade Introduction to Electrical Circuits module 26103-14 NCCER Orientation to the Electrical Trade Electrical Theroy Module 26104-14

Level 3 Strategic Thinking	BT7.3 Illustrate uses of electrical materials. Examples: • Manipulate switches, outlets and light fixtures • Complete construction of electrical project(s)	Invite a career professional to visit and explain the electrical trades The student will learn how to interact and work cooperatively as a team member on an electrical installation project NCCER Orientation to the Electrical Trade Device Boxes module 26106-14

Notes:

Indicator # BT 8 Employ basic knowledge and methods of concrete technology

Webb Level	*Sub-indicator*	*Integrated Content*
Level 1 Recall	BT8.1 Identify safe practice associated with concrete materials Examples: • Name basic codes and techniques of concrete construction applications • Describe safe use of concrete tools • List concrete terminology and uses of concrete	Learn to make decisions NCCER Concrete Finishing Level One Introduction to Concrete Construction and Finishing module 23101 NCCER Concrete Finishing Level One Safety Requirements module 23102
Level 3 Strategic Thinking	BT8.2 Calculate the various required ingredients used in concrete. Examples: • Convert formula for making concrete • Interpret procedure for making cement mortar • Concrete testing (slump test, cylinder test, etc.)	NCCER Concrete Finishing Level One Properties of Concrete module 23103
Level 4 Extended Thinking	BT8.3 Employ application of concrete in different situations. Examples: • Operate tools for placing concrete foundations and floors in different situations • Solve finishing procedures for floors, sidewalks, and driveways • Maintain proper maintenance of equipment when project is finished	Invite a career professional to visit and explain the concrete construction Interact and work cooperatively as a team member on construction crew NCCER Concrete Finishing Level One Tools and Equipment module 23104

Notes:

Indicator # BT 9 Student will participate in career exploration activities

Webb Level	*Sub-indicator*	*Integrated Content*
Level 4 Extended Thinking	BT9.1 Research career opportunities in the architecture and construction fields. Examples: • Utilizing career exploration software, research and write a report on career opportunities in the Architecture and Construction fields • Utilize career exploration software to research educational requirements for chosen career path • Utilizing career exploration software, update student's portfolio • Utilize industry speaker	Invite a career professional to visit Identify personal skills, interests and abilities and relate them to current career choice Learn to use the Internet to access career/planning information Document information into MyLife portfolio Apply decision making skills to career planning, course selection and career transition

Notes:

Residential Construction

Career Cluster	Architecture and Construction
Course Code	17003
Prerequisite(s)	Introduction to Architecture and Construction; Building Trades
Credit	.5-1
Program of Study and Sequence	Foundation Course-Introduction to Architecture and Construction-Building Trades
Student Organization	SkillsUSA
Coordinating Work-Based Learning	Shadowing, speakers, internships, apprenticeships
Industry Certifications	OSHA 10
Dual Credit or Dual Enrollment	TBD
Teacher Certification	Building Trades, Technology Education
Resources	

Course Description:

Students will gain in depth knowledge of residential construction by identifying and demonstrating correct safety procedures, construction math, blueprint reading and basic surveying techniques. The student will also be able to identify building products, and safely and correctly use various hand/power/pneumatic tools. Concrete construction applications and construction of a residential house will be the main thrust of this course. The student will be able to frame floor, wall and ceiling/roof systems. Once the framing is complete the student will install windows and doors, apply thermal and moisture protection, apply exterior sheathing along with exterior siding and roofing material. Interior work will be performed by installing drywall, installing cabinets and conducting interior finish work. The concept of stair layout and construction will be incorporated in this class. Basic residential electrical and plumbing will be performed as it relates to the necessary requirements in the building process. The National Center for Construction Education & Research (NCCER) competencies/objectives are followed as a resource.

Program of Study Application

This is the fourth course in the suggested sequence of the Residential Construction Program of Study. It is recommended that it is preceded by (1) Foundation Courses, (2) Introduction to Architecture and Construction, and (3) Building Trades; and followed by (5) Capstone Experience.

Course Standards

Indicator # RC 1 Understand and apply industry safety procedures

Webb Level	*Sub-indicator*	*Integrated Content*
Level 1 Recall	RC1.1 Demonstrate proper industry safety standards. Examples: • Complete and or obtain a 10 hour OSHA (Occupational Safety Health Administration) certification • Demonstrate the use of protective clothing and safety equipment • Explain the function of Material Safety Data Sheets (MSDS) • Explain and practice Lockout/Tag out procedures • Know and follow the safety requirements for working in confined spaces • Maintain a written portfolio record of written safety examinations and equipment examinations which the student has passed	Certificate in OSHA training Transfer portfolio records in their MyLife portfolio NCCER Core Basic Safety Module 00101-09

Notes:

Indicator # RC 2: Utilize appropriate industry math skills and formulas

Webb Level	*Sub-indicator*	*Integrated Content*
Level 3 Strategic Thinking	RC2.1 Understand and demonstrate basic math skills. Examples: • Add, subtract, multiply, and divide whole numbers with and without a calculator • Add, subtract, multiply, and divide fractions • Add, subtract, multiply, and divide decimals, with and without a calculator • Convert decimals to percentages and percentages to decimals • Convert fractions to decimals and decimals to fractions • Calculate the necessary units of measure for a project	Develop an awareness of personal abilities, skills, interests and motivations. NCCER Core Introduction to Construction Math Module 00102-09

Notes:

Indicator # RC 3 Understand concepts of blueprint reading and perform basic survey techniques

Webb Level	*Sub-indicator*	*Integrated Content*
Level 2 Skill/ Concept	RC3.1 Demonstrate how to read blueprints. Examples: • Describe the types of drawings usually included in a set of plans and list the information found on each type • Identify the different types of lines used on construction drawings • Identify selected architectural symbols commonly used to represent materials on plans • Identify selected electrical, mechanical, and plumbing symbols • Read and interpret plans, elevations, schedules, sections, and details contained in basic construction drawings • Demonstrate or describe how to perform a quantity takeoff for materials	Suggested Activity: Invite a career professional to visit and explain the use of plans for a structure NCCER Carpentry Level one Introduction to Construction Drawings, Specifications, & Layout Module 27104-13
Level 3 Strategic Thinking	RC3.2 Demonstrate survey techniques and site layout. Examples: • Describe the major responsibilities of the carpenter relative to site layout • Convert measurements stated in feet and inches to equivalent measurements stated in decimal feet, and vice versa • Use taping and/or chaining equipment and procedures to make distance measurements and perform site layout tasks • Use a builder's level or transit and differential leveling procedures to determine site and building elevations • Check and/or establish 90 degree angle using the 3/4/5 rule	Suggested Activity: Invite a career professional to visit and explain the use of plans for a structure The student will learn how to interact and work cooperatively as a team member on a survey crew

Notes:

Indicator # RC 4 Identify and understand wood building materials, fasteners, and adhesives

Webb Level	*Sub-indicator*	*Integrated Content*
Level 1 Recall	RC4.1 Understand and demonstrate the use of wood building materials. Examples: • Explain the terms commonly used in discussing wood and lumber • Identify various types of imperfections that are found in lumber • Interpret grade markings on lumber and plywood • Identify the uses of and safety precautions associated with pressure-treated lumber • State the uses of various types of engineered lumber	Suggested Activities: Take a field trip to a local lumber yard NCCER Carpentry Level one Building Materials, Fssteners, & Adhesives Module 27102-13
Level 1 Recall	RC4.2 Understand and demonstrate the use of fasteners and adhesives. Examples: • List the basic nail and staple types and their uses • Identify the different types of anchors and their uses • Describe the common types of adhesives used in construction work and explain their uses	Suggested Activities: Take a field trip to a local lumber yard NCCER Carpentry Level one Building Materials, Fasteners, & Adhesives Module 27102-13

Notes:

Indicator # RC 5 Identify and correctly use appropriate hand, power and pneumatic tools

Webb Level	*Sub-indicator*	*Integrated Content*
Level 2 Skill/ Concept	RC5.1 Demonstrate safe and proper use of hand tools. Examples: • Identify the hand tools commonly used by carpenters and describe their use • Use hand tools in safe and appropriate manner	Suggested Activities: Have a tool rep. visit the class NCCER Carpentry Level one Hand and Power Tools Module 27103-13
Level 2 Skill/ Concept	RC5.2 Demonstrate safe and proper use of power tools. Examples: • State general safety rules for operating all power tools, regardless of type • State general rules for maintaining all power tools • Identify the portable power tools used and describe their uses • Use portable power tools in a safe and appropriate manner	Suggested Activities: Have a tool rep. visit the class NCCER Carpentry Level one Hand and Power Tools Module 27103-13
Level 2 Skill/ Concept	RC5.3 Demonstrate safe and proper use of pneumatic tools. Examples: • State general safety rules for operating all pneumatic tools • State general rules for maintaining all pneumatic tools • Use pneumatic tools in a safe and appropriate manner	Suggested Activities: Have a tool rep. visit the class NCCER Carpentry Level one Hand and Power Tools Module 27103-13

Notes:

Indicator # RC 6 Integrate concrete technology to achieve thorough construction background

Webb Level	*Sub-indicator*	*Integrated Content*
Level 3 Strategic Thinking	RC6.1 Understand and demonstrate the uses of concrete and reinforcing materials. Examples: • Perform volume estimates for concrete quantity requirements • Identify types of concrete reinforcement bars and describe their use • Identify types of reinforcement bar supports and describe their use • Recognize four kinds of footings – Continuous or spread, stepped, pier, grade beam • Recognize types of concrete placements that require the construction of edge forms – slabs with or without a foundation, driveways, sidewalks, approaches • Explain the purpose of a screed and identify the different types of screeds • Identify and explain the different concrete curing methods • Explain the safety procedures associated with using concrete forms	Suggested Activity: Invite a career professional to visit and explain concrete construction. The student will learn how to interact and work cooperatively as a team member placing rebar and placing concrete NCCER Concrete Finishing Modules 23101, 23102, 23103,23104,23105,23106,23107,23108,23109

Notes:

Indicator # RC 7 Understand and perform framing of flooring, wall, ceiling and roofing systems

Webb Level	*Sub-indicator*	*Integrated Content*
Level 2 Skill/ Concept	RC7.1 Understand and demonstrate framing of flooring systems. Examples: • Read and understand drawings and specifications to determine floor system requirements • Identify floor and sill framing and support members • Name methods used to fasten sills to the foundation • List and recognize different types of floor joists • List and recognize different types of flooring materials • Explain the purposes of subflooring and underlayment • Match selected fasteners used in floor framing to their correct uses • Demonstrate the ability to: layout and construct a floor assembly, install joists for a cantilever floor, install a single floor system using tongue and groove plywood/OSB panels	Suggested Activity: Visit a job-site The student will learn how to interact and work cooperatively as a team member setting floor systems NCCER Carpentry Level one Floor Systems Module 27105-13
Level 3 Strategic Thinking	RC7.2 Understand and demonstrate framing of wall and ceiling systems. Examples: • Identify the components of a wall and ceiling layout • Describe the procedure for laying out a wood frame wall, including plates, corner posts, door and window partition T's bracing, and fire stops • Describe the correct procedure for assembling and erecting an exterior wall • Describe the common materials and methods used for installing sheathing on walls • Layout, assemble, erect, and brace exterior walls for a frame building	Suggested Activity: Visit a job-site The student will learn how to interact and work cooperatively as a team member framing up wall systems NCCER Carpentry Level one Wall Systems Module 27111-13 NCCER Carpentry Level one Ceiling and Roof Framing Module 27112-13

Level 3 Strategic Thinking	RC7.3 Understand and demonstrate framing of a roofing systems. Examples: • Understand the terms associated with roof framing • Identify the roof framing members used in gable and hip roofs • Identify the various types of trusses used in roof framing • Use rafter framing square, speed square, and calculator in laying out a roof • Identify various types of sheathing used in roof construction • Erect a pitched roof using trusses	Suggested Activity: Visit a job-site The student will learn how to interact and work cooperatively as a team member erecting roofing systems NCCER Carpentry Level one Ceiling and Roof Framing Module 27112-13

Notes:

Indicator # RC 8 Understand and demonstrate installation of windows and exterior doors

Webb Level	*Sub-indicator*	*Integrated Content*
Level 2 Skill/ Concept	RC8.1 Understand and demonstrate installation of windows. Examples: • Identify various types of fixed, sliding and swinging windows • Identify the parts of a window installation • State the requirements for a proper window installation • Install a pre-hung window	Suggested Activity: Have a window manufacture rep. visit the class The student will learn how to interact and work cooperatively as a team member installing pre-hung windows NCCER Carpentry Level one Introduction to Building Envelope Systems Module 27109-13
Level 2 Skill/ Concept	RC8.2 Understand and demonstrate installation of exterior doors. Examples: • Identify the common types of exterior doors and explain how they are constructed • Identify the types of thresholds used with exterior doors • Install a pre-hung exterior door with weather-stripping • Identify the various types of locksets used on exterior doors and explain how they are installed • Install a lockset	Suggested Activity: Have a door manufacture rep. visit the class The student will learn how to interact and work cooperatively as a team member installing exterior doors NCCER Carpentry Level one Introduction to Building Envelope Systems Module 27109-136

Notes:

Indicator # RC 9 Identify and perform different exterior finishing methods

Webb Level	*Sub-indicator*	*Integrated Content*
Level 2 Skill/ Concept	RC9.1 Understand and demonstrate installation of exterior finish. Examples: • Describe the purpose of wall insulation and flashing • Identify the types and parts of common cornices • Demonstrate the installation of selected common cornices • Demonstrate lap and panel siding estimating methods • Describe the types and applications of common siding • Install selected types of common siding	Suggested Activity: Have a siding manufacture rep. visit the class Visit a job-site The student will learn how to interact and work cooperatively as a team member installing exterior finish material NCCER Carpentry Level one Introductions to Building Envelope Systems Module 27109-13

Notes:

Indicator # RC 10 Identify and understand different roofing applications

Webb Level	*Sub-indicator*	*Integrated Content*
Level 2 Skill/ Concept	RC10.1 Understand and demonstrate installation of roofing materials. Examples: • Identify the material and methods used in roofing • Explain the safety requirements for roof jobs • Install fiberglass shingles on gable and hip roofs • Close up a valley using shingles • Explain how to make various roof projections watertight when using shingles	Suggested Activity: Have a roofing manufacture rep. visit the class Visit a job-site The student will learn how to interact and work cooperatively as a team member while installing shingles and roof finish work.

Notes:

Indicator # RC 11 Understand the importance of, and properly install, thermal and moisture protection

Webb Level	*Sub-indicator*	*Integrated Content*
Level 2 Skill/ Concept	RC11.1 Understand and demonstrate installation of thermal and moisture protection. Examples: • Describe the requirements for insulation • Describe the characteristics of various types of insulatimg material • Calculate the required amounts of insulation materials • Describe the requirements for moisture control and ventilation • Install selected vapor barriers • Describe the various methods of waterproofing • Describe air infiltration control requirements • Install selected building wraps	Suggested Activity: Have a moisture barrier rep. visit the class Visit a job-site The student will learn how to interact and work cooperatively as a team member as they install moisture and thermal protection NCCER Drywall Level one Thermal & moisture Protections Module 45103-07

Notes:

Indicator # RC 12 Perform drywall installation and finishing techniques

Webb Level	*Sub-indicator*	*Integrated Content*
Level 2 Skill/ Concept	RC12.1 Understand and demonstrate drywall installation. Examples: • Identify the different types of gypsum wallboard (drywall) and their uses • Select the type and thickness of drywall required for specific installations • Select fasteners for drywall installation • Explain the fastener schedules for different types of drywall installations • Perform single-layer drywall installations	Suggested Activity: Have a drywall professional visit the class Visit a job-site The student will learn how to interact and work cooperatively as a team member as they hang and install drywall NCCER Drywall Level one Drywall Installation Module 45104-07
Level 2 Skill/ Concept	RC12.2 Understand and demonstrate drywall finishing. Examples: • Identify the hand tools used in drywall finishing and demonstrate the ability to use these tools • Identify the automatic tools used in drywall finishing • Identify the materials used in drywall finishing	Suggested Activity: Have a drywall professional visit the class Visit a job-site NCCER Drywall Level one Drywall Finishing Module 45105-07

Notes:

Indicator # RC 13 Understand methods and complete interior finish work

Webb Level	*Sub-indicator*	*Integrated Content*
Level 2 Skill/ Concept	RC13.1 Understand and demonstrate interior finishing. Examples: • Identify various types of door jambs and frames and demonstrate the installation procedures for placing selected door jambs and frames in different types of interior partitions • List and identify specific items included on a typical door schedule • Demonstrate the procedure of placing and hanging a selected door • Identify the different types of standard moldings and describe their uses • Make square and miter cuts using a miter box or power miter saw • Make coped joint cuts using a coping saw • Install interior trim, including: door trim, window trim, base trim, ceiling trim	Suggested Activity: Have a millwork manufacture rep. visit the class Visit a job-site The student will learn how to interact and work cooperatively as a team member installing a door

Notes:

Indicator # RC 14 Understand the cabinet manufacturing process and install cabinets

Webb Level	*Sub-indicator*	*Integrated Content*
Level 2 Skill/ Concept	RC14.1 Understand basic cabinet design and installation. Examples: • State the classes and sizes of typical base and wall kitchen cabinets • Recognize the common types of woods used to make cabinets • Identify cabinet components and hardware and describe their purpose • Install factory made cabinets, countertops, and backsplashes	Suggested Activity: Have a cabinet manufacture rep. visit the class Visit a job-site The student will learn how to interact and work cooperatively as a team member as they hang and install cabinets

Notes:

Indicator # RC 15 Understand and demonstrate installation of stairs.

Webb Level	*Sub-indicator*	*Integrated Content*
Level 2 Skill/ Concept	RC15.1 Identify the various types and parts of stairs. Examples: • Identify the various types of stairs • Identify the various parts of stairs • Identify the materials used in the construction of stairs • Interpret construction drawings of stairs • Explain the methods of constructing various types of stairs • Understand the various terms and definitions relating to stairs	Suggested Activity: Visit a job-site The student will learn how to interact and work cooperatively as a team member NCCER Carpentry Level one Basic Stair Layout Module 27110-13
Level 2 Skill/ Concept	RC15.2 Using appropriate math formula calculate the number and sizes of risers and treads for a stairway. Examples: • Interpret construction drawings of stairs • Understand the various terms and definitions relating to stairs • Determine the number and sizes of risers and treads required for a stairway	Suggested Activity: Visit a job-site The student will learn how to interact and work cooperatively as a team member NCCER Carpentry Level one Basic Stair Layout Module 27110-13
Level 2 Skill/ Concept	RC15.3 Layout and cut stringers. Examples: • Interpret construction drawings of stairs • Explain the methods of constructing various types of stairs • Understand the various terms and definitions relating to stairs • Lay out and cut stringers • Determine the number and sizes of risers and treads required for a stairway	Suggested Activity: Visit a job-site The student will learn how to interact and work cooperatively as a team member NCCER Carpentry Level one Basic Stair Layout Module 27110-13

Notes:

Indicator # RC 16 Study the principles and standards of Basic Residential Electric and Plumbing applications

Webb Level	*Sub-indicator*	*Integrated Content*
Level 2 Skill/ Concept	RC16.1 Understand and demonstrate basic residential electric and plumbing applications. Examples: • Interpret basic electric and plumbing codes • Identify basic residential wiring and plumbing symbols on construction drawings • Understand the layout of a residential dwelling to accommodate residential wiring and plumbing applications • Identify safety requirements when working around electric and plumbing applications • Construct a basic residential plumbing project • Construct a basic residential wring project	Suggested Activity: Have a subcontracting professional visit the class Visit a job-site The student will learn how to interact and work cooperatively as a team member as a plumbing or electrical contractor

Notes:

Indicator # RC 17 Student will participate in career exploration activities

Webb Level	*Sub-indicator*	*Integrated Content*
Level 2 Skill/ Concept	RC17.1 Research career opportunities in the Architecture and Construction fields. Examples: • Utilizing career exploration software research and write a report on career opportunities in the construction/manufacturing field • Utilize career exploration software to research educational requirements for a chosen career path • Utilizing career exploration software, update the students portfolio	Suggested Activity: Invite a career professional to visit and explain their duties Incorporate a Career Path in the MyLife portfolio

Notes: