

Foundational CTE Courses

Career Exploration (22151[^]) Employability (22152[^]) Entrepreneurship (12053[^]) Foundations of Technology (10004[^]) Leadership & Service (22101[^])

Cluster Courses

Intro to Architecture and Construction (17006) Drafting & Design I (21102) Introduction to Technology Education (21051)

Pathway Courses

<i>Design/Pre-Construction Pathway</i>	<i>Construction Pathway</i>	<i>Maintenance/Operations Pathway</i>
Drafting and Design II- Architectural (21103) Finish Carpentry I (17007) Finish Carpentry II (17005)	Drafting and Design II- Architectural (21103) Finish Carpentry I (17007) Finish Carpentry II (17005) Construction Trades I (17002) Construction Trades II - Residential (17003) Construction Equipment I (17990) Construction Equipment II (17991)	Construction Equipment I (17990) Construction Equipment II (17991)

Dual Credit Courses

Visit www.sdmylife.com for a full list of dual credit courses in the Architecture & Construction Career Cluster.

Academic CTE Courses

Geometry (02072[^]) Trigonometry (02103[^])

Capstone CTE Courses

Entrepreneurship Experience (80026) Senior Experience (80019[^]) Youth Apprenticeship (80020) Service Learning (22104) Youth Internships (80018[^])

[^]Denotes course is available on the SD Virtual School (<http://www.sdvs.k12.sd.us/>)

Introduction to Architecture and Construction

Career Cluster	Architecture and Construction
Course Code	17006
Prerequisite(s)	None
Credit	.5 - 1
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	Architecture & Construction Cluster Endorsement; Building Trades Endorsement;
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.

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Two Apply	IAC 1.1 Compare career possibilities in the drafting industry.	
Two Apply	IAC 1.3 Research career opportunities in the architecture and construction fields.	

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

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Two Apply	IAC 2.1 Apply general shop safety principles	
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	

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

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Two	IAC 3.1 Demonstrate proper use of appropriate math skills	

Demonstrate		
Two Demonstrate	IAC 3.2 Demonstrate proper measuring and layout skills	

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

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
One Identify	IAC 4.1 Identify wood species and engineered building materials.	
One Recognize	IAC 4.2 Recognize proper application of fasteners, adhesives, and hardware.	
One Explore	IAC 4.3 Explore new upcoming materials used in building industry.	

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

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
One Recognize	IAC 5.1 Recognize basic drafting terms and abbreviations	
Two Differentiate	IAC 5.2 Differentiate between different drafting styles	
Two Demonstrate	IAC 5.3 Identify different aspects of blueprints/project plans to show a working knowledge of specifications.	
Two Classify	IAC 5.4 Classify the different styles of residential architectural structures	

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

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
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	
Two Construct	IAC 6.3 Construct a project using the assigned design process	
Two Demonstrate	IAC 6.4 Demonstrate necessary job skills needed in architecture and construction industries	

Proposed

Construction Trades I

Career Cluster	Architecture and Construction
Course Code	17002
Prerequisite(s)	Introduction to Architecture and Construction
Credit	.5 - 1
Program of Study and Sequence	Foundation Courses, Introduction to Architecture and Construction, Construction Trades I, 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	Architecture & Construction Cluster Endorsement; Construction Pathway Endorsement; Construction Trades I Endorsement;
Resources	

Course Description:

Students will gain insight into the career within construction 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) Construction Trades II-Residential and (5) Capstone Experience.

Indicator # CT 1 Understand and Apply Industry Safety Procedures

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2 Skill/ Concept	CT1.1 Identify and demonstrate the proper industry safety standards	

Indicator # CT 2 Utilize appropriate industry math skills and formulas

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2 Skill/ Concept	CT2.1 Understand and demonstrate basic math skills and formulas	

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

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2 Skill/ Concept	CT3.1 Demonstrate safe and proper use of hand tools.	

Level 2 Skill/ Concept	CT3.2 Demonstrate safe and proper use of power tools	
Level 2 Skill / Concept	CT3.3 Demonstrate safe and proper use of pneumatic tools.	

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

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 3 Strategic Thinking	CT4.1 Demonstrate how to read blueprints.	
Level 3 Strategic Thinking	CT4.2 Demonstrate basic survey techniques.	

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

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 3 Strategic Thinking	CT 5.1 Demonstrate the understanding of the building process by the building of a construction project.	

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

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 1 Recall	CT6.1 Define safety procedures for plumbing.	
Level 2 Skill/ Concept	CT6.2 Distinguish pipe sizes, fittings, adapters, and coupling.	
Level 3 Strategic Thinking	CT6.3 Demonstrate the use of plumbing materials.	

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

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 1 Recall	CT7.1 Select electrical materials considering safety.	
Level 2 Skill/ Concept	CT7.2 Identify electrical materials.	
Level 3 Strategic Thinking	CT7.3 Illustrate uses of electrical materials.	

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

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 1 Recall	CT8.1 Identify safe practice associated with concrete materials	
Level 3 Strategic Thinking	CT8.2 Calculate the various required ingredients used in concrete.	
Level 4 Extended Thinking	CT8.3 Employ application of concrete in different situations.	

Indicator # CT 9 Student will participate in career exploration activities

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 4 Extended Thinking	CT9.1 Research career opportunities in residential and commercial (including horizontal and vertical) construction.	

Construction Trades II- Residential

Career Cluster	Architecture and Construction
Course Code	17003
Prerequisite(s)	Introduction to Architecture and Construction; Construction Trades I
Credit	.5-1
Program of Study and Sequence	Foundation Course-Introduction to Architecture and Construction- Construction Trades I
Student Organization	SkillsUSA
Coordinating Work-Based Learning	Shadowing, speakers, internships, apprenticeships
Industry Certifications	OSHA 10
Dual Credit or Dual Enrollment	TBD
Teacher Certification	Architecture & Construction Cluster Endorsement; Construction Pathway Endorsement; Building Trades Endorsement
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 Architecture and Construction Program of Study. It is recommended that it is preceded by (1) Foundation Courses, (2) Introduction to Architecture and Construction, and (3) Construction Trades I; and followed by (5) Capstone Experience.

Course Standards

Indicator # CTIIR 1 Understand and apply industry safety procedures

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 1 Recall	CTIIR1.1 Demonstrate proper industry safety standards.	

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

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 3 Strategic Thinking	CTIIR2.1 Understand and demonstrate basic math skills.	

Notes:

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

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2 Skill/ Concept	CTIIR3.1 Demonstrate how to read blueprints.	
Level 3 Strategic Thinking	CTIIR3.2 Demonstrate survey techniques and site layout.	

Notes:

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

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 1 Recall	CTIIR4.1 Understand and demonstrate the use of wood building materials.	
Level 1 Recall	CTIIR4.2 Understand and demonstrate the use of fasteners and adhesives.	

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

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2 Skill/ Concept	CTIIR5.1 Demonstrate safe and proper use of hand tools.	
Level 2 Skill/ Concept	CTIIR5.2 Demonstrate safe and proper use of power tools.	
Level 2 Skill/ Concept	CTIIR5.3 Demonstrate safe and proper use of pneumatic tools.	

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

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 3 Strategic Thinking	CTIIR6.1 Understand and demonstrate the uses of concrete and reinforcing materials.	

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

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2 Skill/ Concept	CTIIR7.1 Understand and demonstrate framing of flooring systems	
Level 3 Strategic Thinking	CTIIR7.2 Understand and demonstrate framing of wall and ceiling systems.	

Proposed

Level 3 Strategic Thinking	CTIIR7.3 Understand and demonstrate framing of a roofing systems.	
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Indicator # CTIIR 8 Understand and demonstrate installation of windows and exterior doors

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2 Skill/ Concept	CTIIR8.1 Understand and demonstrate installation of windows.	
Level 2 Skill/ Concept	CTIIR8.2 Understand and demonstrate installation of exterior doors.	

Notes:

Indicator # CTIIR 9 Identify and perform different exterior finishing methods

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2 Skill/ Concept	CTIIR9.1 Understand and demonstrate installation of exterior finish.	

Notes:

Indicator # CTIIR 10 Identify and understand different roofing applications

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2 Skill/	CTIIR10.1 Understand and demonstrate installation of roofing materials. •	

Concept		
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Notes:

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

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2 Skill/ Concept	CTIIR11.1 Understand and demonstrate installation of thermal and moisture protection.	

Indicator # CTIIR 12 Perform drywall installation and finishing techniques

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2 Skill/ Concept	CTIIR12.1 Understand and demonstrate drywall installation.	
Level 2 Skill/ Concept	CTIIR12.2 Understand and demonstrate drywall finishing.	

Indicator # CTIIR 13 Understand methods and complete interior finish work

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2 Skill/ Concept	CTIIR13.1 Understand and demonstrate interior finishing.	

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

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2 Skill/	CTIIR14.1 Understand basic cabinet design and installation.	

Concept		
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Indicator # CTIIR 15 Understand and demonstrate installation of stairs.

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2 Skill/ Concept	CTIIR15.1 Identify the various types and parts of stairs.	
Level 2 Skill/ Concept	CTIIR15.2 Using appropriate math formula calculate the number and sizes of risers and treads for a stairway.	
Level 2 Skill/ Concept	CTIIR15.3 Layout and cut stringers.	

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

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2 Skill/ Concept	CTIIR16.1 Understand and demonstrate basic residential electric and plumbing applications.	

Indicator # CTIIR 17 Student will participate in career exploration activities

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2 Skill/ Concept	CTIIR17.1 Research career opportunities in the Architecture and Construction fields.	

Drafting and Design I

Career Cluster	Architecture & Construction
Course Code	21102
Prerequisite(s)	Algebra I and Geometry Recommended
Credit	.5 - 1
Program of Study and Sequence	Drafting and Design I 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	Architecture & Construction Cluster Endorsement; Design & Pre-Construction Pathway Endorsement; Manufacturing Cluster Endorsement; STEM Cluster Endorsement; Engineering & Robotics Pathway Endorsement; Drafting Endorsement;
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 recommended that students have taken Algebra I and Geometry before taking this course.

Program of Study Application: Drafting and Design I 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 # DDI 1 Examine basic drafting terminology and equipment.**

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
One Recognize	DDI 1.1 Recognize basic drafting terms and abbreviations.	
Two Differentiate	DDI 1.2 Differentiate basic and CAD drafting tools and their uses.	

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

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Two Apply	DDI 2.1 Apply algebraic and trigonometric formulas used in drafting and design.	
Two Understand	DDI 2.2 Understand the various drawing scales used in drafting.	

Indicator # DDI 3 Examine basic drafting fundamental and technical skills

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

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

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Four Create	DDI 4.1 Create orthographic projections	
Four Create	DDI 4.2 Create isometric and pictorial drawings.	

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

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

Indicator # DDI 6 Explore career-ready practices.

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
One Understand	DDI 6.1 Examine careers in architectural and mechanical drafting.	
Two Compare	DDI 6.2 Compare career possibilities in the drafting industry.	

Drafting and Design II

Career Cluster	Architecture & Construction
Course Code	21103
Prerequisite(s)	Drafting and Design I
Credit	.5
Program of Study and Sequence	Foundation Courses, Introduction to Architecture and Construction, Introduction to Drafting and Design, Drafting and Design II, 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	Architecture & Construction Cluster Endorsement; Construction Pathway Endorsement; Design & Pre-Construction Pathway Endorsement; STEM Cluster Endorsement; Engineering & Robotics Pathway Endorsement; Drafting Endorsement;
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 Drafting and Design I 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) Drafting and Design I; and followed by (5) Capstone Experience.

Course Standards

Indicator # DDII 1 Understand architectural design fundamentals and history.

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 1 Recall	DDII 1.1 Identify architectural products and styles.	
Level 2 Skill/ Concept	DDII 1.2 Interpret the fundamentals of framing plans.	
Level 2 Skill/ Concept	DDII 1.3 Identify building codes and governing bodies	
Level 1 Recall	DDII 1.4 Identify residential building materials	

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

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2 Skill/ Concept	DDII 2.1 Examine drawing identification and management techniques used in architectural drafting.	
Level 3 Strategic Thinking	DDII 2.2 Illustrate proper dimensioning and notation practices used in architectural drafting.	

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

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 4 Extended Thinking	DDII 3.1 Create a plot/site plan for a residence.	
Level 3	DDII 3.2 Design footings and foundation for a residence.	•

Strategic Thinking		
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Indicator # DDII 4 Generate the necessary construction plans to build a residence.

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 3 Strategic Thinking	DDII 4.1 Develop a floor plan using accepted symbols and techniques.	
Level 3 Strategic Thinking	DDII 4.2 Prepare a working drawing of the residence HVAC, lights and electrical needs.	
Level 3 Strategic Thinking	DDII 4.3 Design a residential roof plan.	
Level 2 Skill/ Concept	DDII 4.4 Understand the use of elevations in the design of a residence.	
Level 3 Strategic Thinking	DDII 4.5 Draw interior and exterior stair details appropriate to those found in a residence.	
Level 3 Strategic Thinking	DDII 4.6 Develop door, window, and finishing schedules.	
Level 2 Skill/ Concept	DDII 4.7 Understand basic estimating practices used in the construction industry.	
Level 4 Extended Thinking	DDII 4.8 Generate final presentation drawings and three dimensional computer model.	

Finish Carpentry I

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	OSHA 10-Hour Safety Certification
Dual Credit or Dual Enrollment	TBD
Teacher Certification	Architecture & Construction Cluster Endorsement; Construction Pathway Endorsement; Building Trades Endorsement;
Resources	

Course Description:

This 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

Finish Carpentry I

Finish Carpentry II

Capstone Experience

Course Standards

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

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Two Apply	FCI 1.1 Apply hand/power tool and lab safety standards.	
One Describe	FCI 1.2 Describe and wear appropriate personal protective equipment (PPE) when needed.	
One Indicate	FCI 1.3 Indicate a knowledge of government regulations regarding health and safety in the shop.	

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

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Three Investigate	FCI 2.1 Investigate and examine career opportunities in cabinetry industry.	
Two Demonstrate	FCI 2.2 Demonstrate an understanding of necessary job skills needed in cabinetry careers.	

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

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Two Demonstrate	FCI 3.1 Demonstrate proper use of appropriate math skills	

Two Demonstrate	FCI 3.2 Demonstrate an understanding of the difference between board feet and linear feet	
Two Demonstrate	FCI 3.3 Demonstrate proper measuring and layout skills	

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

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
One Identify	FCI 4.1 Identify wood species and engineered materials.	
Three Analyze	FCI 4.2 Analyze design elements of a project plan.	
Four Create Implement	FCI 4.3 Create and implement a bill of materials and cut list from a project drawing.	
One Identify	FCI 4.4 Identify various types of hardware, fasteners, and adhesives used in the cabinetry industry.	

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

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Two Demonstrate	FCI 5.1 Demonstrate common joinery techniques	

Two Demonstrate Assemble	FCI 5.2 Demonstrate knowledge of industry concepts to assemble projects	
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Indicator # FCI 6 Recognize and apply surface preparation and finishing techniques.

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Two Apply	FCI 6.1 Apply surface preparation techniques	
Two Apply	FCI 6.2 Apply finishing products	

Proposed

Finish Carpentry II

Career Cluster	Architecture and Construction
Course Code	17005
Prerequisite(s)	Cabinetry
Credit	.5-1
Program of Study and Sequence	Foundation Courses, Introduction to Architecture & Construction, Finish Carpentry I, Finish Carpentry II, Capstone Experience
Student Organization	SkillsUSA
Coordinating Work-Based Learning	Service Learning; Work Place Tours; Job Shadowing
Industry Certifications	OSHA 10-Hour Safety Certification
Dual Credit or Dual Enrollment	TBD
Teacher Certification	Architecture & Construction Cluster Endorsement; Construction Pathway Endorsement; Design & Pre-Construction Pathway Endorsement
Resources	

Course Description:

This course prepares individuals to apply technical knowledge and skills to plan and estimate projects, as well as set up and operate industrial woodworking machinery. Students will use industrial machinery to design and fabricate casework (cabinetry) and architectural millwork. This course will cover safe use of hand and power tools and machinery used in the production of casework and millwork. A variety of projects 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)
- Finish Carpentry I (prerequisite)
- Finish Carpentry II

- Capstone Experience

Course Standards

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

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
One Apply	FCII 1.1 Apply hand/power/industrial tool and lab safety practices.	
Two Determine	FCII 1.2 Determine and wear appropriate personal protective equipment (PPE)	
One Comply	FCII 1.3 Comply with government regulations regarding health and safety in the shop.	

Indicator # FCII 2 Evaluate the career market that surrounds the carpentry industry.

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Three Acquire	2.1 Acquire residential, civil and commercial career information and demonstrate knowledge of the career-planning process	
Three Identify	2.2 Identify individual career goals in the carpentry industry.	
Three Develop	2.3 Enhance the development of employment readiness skills	

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

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
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Two Apply	FCII 3.1 Apply geometric formulas to determine areas of various structures.	
Two Apply	FCII 3.2 Apply appropriate formulas to determine percentages/decimals.	
Two Apply	FCII 3.3 Apply appropriate formulas to determine ratios, fractions, and proportion measures.	
Three Apply	FCII 3.4 Apply appropriate formulas to determine measurement of dimensions, spaces, and structures.	
Four Develop Conceptualize	FCII 3.5 Develop a model that shows the conceptual understanding of a three-dimensional form from a two-dimensional drawing.	
One Define	FCII 3.6 Define the X,Y,Z coordinates involved in common Computer numeric control (CNC) applications.	

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

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Three Differentiate	FCII 4.1 Differentiate various cabinetry materials and their appropriate applications.	
Two Identify	FCII 4.2 Identify the common grades of lumber and sheet goods.	
Two Describe	FCII 4.3 Describe and identify natural defects in woods	
One Utilize	FCII 4.4 Utilize proper storage and handling techniques	
Four Develop	FCII 4.5 Create a project plan, bill of materials, cut list and timeline.	

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

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Two Determine	FCII 5.1 Determine plumb, level, and square.	
Two Determine	FCII 5.2 Demonstrate proper techniques used in various sawing, shaping, carving, molding, and routing applications.	
Three Apply Fabricate	FCII 5.3 Apply various fabricating techniques in casework and millwork.	
Three Differentiate	FCII 5.4 Differentiate between different styles in casements	

Proposed

One Identify	FCII 5.5 Identify and create the basic wood and mechanical joints used in cabinetry.	
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Indicator # FCII 6 Demonstrate the use of cabinet fasteners and hardware.

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Two Determine	FCII 6.1 Determine proper application and use of mechanical fasteners and adhesives.	
Two Analyze	FCII 6.2 Analyze different hardware and their applications.	

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

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Two Develop	FCII 7.1 Develop logical assembly process/procedure	
Two Demonstrate	FCII 7.2 Demonstrate various ways to remove excess adhesive Example: <ul style="list-style-type: none"> • Sanding, chiseling, taping, etc. 	
Two Apply	FCII 7.3 Apply surface preparation skills before finishing Examples: <ul style="list-style-type: none"> • Select proper abrasives and sanding equipment • Fillers 	

Notes:

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

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
One Explain	FCII 8.1 Explain the purpose and applications of various types of finishes and finishing processes.	
Two Apply	FCII 8.3 Utilize safe and approved methods for cleanup and disposal (OSHA, EPA, DENR)	

Proposed

Construction Equipment I

Career Cluster	Architecture and Construction
Course Code	17990
Prerequisite(s)	Introduction to Architecture and Construction
Credit	.5 - 1
Program of Study and Sequence	Foundation Courses, Introduction to Architecture and Construction, Construction Trades I, Construction Trades II- Residential, Construction Equipment I, 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	Architecture & Construction Cluster Endorsement; Construction Pathway Endorsement; Maintenance/Operations Pathway; Construction Trades I Endorsement
Resources	

Course Description:

Construction Equipment I: Students will gain an understanding of safely operating the tools and equipment in the construction trades. Exploration of earth-moving and construction equipment within the context of OSHA and industrial operations standards. Emphasis should be placed on controlling equipment to perform specific operations per industry standards and on basic troubleshooting and maintenance procedures.

Program of Study Application

Construction Equipment I is an intermediate pathway course in the Architecture & Construction career cluster. It can be found in both the Construction and Maintenance/Operations pathways. It is to be preceded by a cluster course and followed by Construction Equipment II and/or a capstone course.

Indicator #CEI 1 Orientation to the Trade

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 1: Recall	CEI 1.1 Explain the basic terminology, types, and uses of equipment	
Level 1: Recall	CEI 1.2 Identify career opportunities available to construction equipment operators and explain the purpose and objectives of an apprentice training program	
Level 1: Recall	CEI 1.3 Explain the responsibilities and characteristics of a good operator	
Level 2: Skill/Concept	CEI 1.4 Explain the importance of construction equipment safety	
Level 1: Recall	CEI 1.5 Describe preventive maintenance procedures	

Indicator #CEI 2: Construction Equipment Safety

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 1: Recall	CEI 2.1 Explain the importance of safety when working with construction equipment	

Level 1: Recall	CEI 2.2 State the purpose of signs, tags, barricades, and lockout/tagout devices used on construction sites	
Level 1: Recall	CEI 2.3 Describe the long- and short-term health effects, first-aid measures, handling, and storage, and/or required personal protective equipment (PPE)	
Level 1: Recall	CEI 2.4 Identify safeguards used in a highway construction work zone	
Level 1: Recall	CEI 2.5 State the general guidelines for a safe operation, maintenance, and transportations of construction equipment	
Level 1: Recall	CEI 2.6 Explain the dangers of working around an excavation area with construction equipment	
Level 1: Recall	CEI 2.7 Describe the importance of Safety Data Sheets (SDS)	

Indicator # CEI 3: FORKLIFTS-Students understand and perform, where possible, lifting, transporting, and placement forklift operations with a focus on safety.

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 1: Recall	CEI 3.1 Identify the components of forklifts	
Level 1: Recall	CEI 3.2 Explain the operations of various components	

Level 2: Skill/Concept	CEI 3.3 Describe preventive maintenance procedures	
Level 1: Recall	CEI 3.4 Describe startup and operating procedures for forklift	

Indicator #CEI 4: ON-ROAD DUMP TRUCKS-Students understand and perform, where possible, appropriate operations using On-Road Dump Trucks.

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 1: Recall	CEI 4.1 Identify the various types of on-road dump trucks	
Level 1: Recall	CEI 4.2 Identify and describe instruments and specialized control systems in dump trucks	
Level 1: Recall	CEI 4.3 List the operator inspection and maintenance requirements	
Level 1: Recall	CEI 4.4 Explain safe driving practices for dump trucks	

Level 2: Skill/Concept	CEI 4.5 Perform basic operations using a dump truck	
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Indicator #CEI 5: SKID STEER-Students understand and perform, where applicable, usage and proper functionality of skid steers.

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 1: Recall	CEI 5.2 Describe the pre start inspection requirements for skid loader	
Level 1: Recall	CEI 5.3 Describe startup, shutdown, and operations procedures for a skid loader	

Indicator #CEI 6: INTERPRETING CIVIL DRAWINGS-Students read and interpret construction site drawings to perform operations.

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2: Skill/Concept	CEI 6.2 Read and interpret drawings	
Level 1: Recall	CEI 6.3 Define common abbreviations	
Level 1: Recall	CEI 6.4 Describe how as-built drawings are prepared	

Indicator #CEI 7:-EQUIPMENT OPERATION-Students understand and perform, where applicable, operations on various pieces of heavy equipment to demonstrate proper startup, shut off, and maintenance procedures for each piece of machinery.

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>

Level 1: Recall	CEI 7.2 Describe pre start inspection requirements for various pieces of machinery	
Level 1: Recall	CEI 7.3 List task related work activities	

Proposed

Construction Equipment II

Career Cluster	Architecture and Construction II
Course Code	17991
Prerequisite(s)	Introduction to Architecture and Construction, Construction Equipment I
Credit	.5 - 1
Program of Study and Sequence	Foundation Courses, Introduction to Architecture and Construction, Construction Equipment I, 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	Architecture & Construction Cluster Endorsement; Construction Pathway Endorsement; Maintenance/Operations Pathway; Construction Trades II Endorsement;
Resources	

Course Description:

Students will gain an advanced understanding of safely operating the tools and equipment in the construction trades. Operation of earth-moving and construction equipment within the context of OSHA and industrial operations standards. Emphasis should be placed on controlling equipment to perform specific operations per industry standards and on basic troubleshooting and maintenance procedures.

Program of Study Application

Construction Equipment II is an advanced pathway course in the Architecture & Construction career cluster. It can be found in both the Construction and Maintenance/Operations pathways. It is to be preceded by a cluster course, Construction Equipment I and followed by a capstone course.

Indicator #CEII 1: Orientation to the Trade

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 1: Recall	CEII 1.1 Explain the basic terminology, types, and uses of equipment	
Level 1: Recall	CEII 1.2 Identify career opportunities available to construction equipment operators and explain the purpose and objectives of an apprentice training program	
Level 1: Recall	CEII 1.3 Explain the responsibilities and characteristics of a good operator	
Level 2: Skill/Concept	CEII 1.4 Explain the importance of construction equipment safety	
Level 1: Recall	CEII 1.5 Describe preventive maintenance procedures	

Indicator #CEI 2: Construction Equipment Safety

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 1: Recall	CEI 2.1 Explain the importance of safety when working with construction equipment	

Level 1: Recall	CEI 2.2 State the purpose of signs, tags, barricades, and lockout/tagout devices used on construction sites	
Level 1: Recall	CEI 2.3 Describe the long- and short-term health effects, first-aid measures, handling, and storage, and/or required personal protective equipment (PPE)	
Level 1: Recall	CEI 2.4 Identify safeguards used in a highway construction work zone	
Level 1: Recall	CEI 2.5 State the general guidelines for a safe operation, maintenance, and transportations of construction equipment	
Level 1: Recall	CEI 2.6 Explain the dangers of working around an excavation area with construction equipment	
Level 1: Recall	CEI 2.7 Describe the importance of Safety Data Sheets (SDS)	

Indicator # CEI 3: FORKLIFTS-Students understand and perform, where possible, lifting, transporting, and placement forklift operations with a focus on safety.

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2: Skill/Concept	CEII 3.1 Demonstrate the operations of various components	
Level 1: Recall	CEII 3.2 Perform preventive maintenance procedures and explain the operations of various components	
Level 2: Skill/Concept	CEII 3.3 Demonstrate proper startup and operating procedures for forklift	

Indicator #CEI 4: ON-ROAD DUMP TRUCKS-Students understand and perform, where possible, appropriate operations using On-Road Dump Trucks.

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 1: Recall	CEII 4.1 Review the various types of on-road dump trucks	
Level 1: Recall	CEII 4.2 Review the requirements of a CDL for on road dump truck operation	
Level 1: Recall	CEII 4.3 Understand the use of instruments and specialized control systems in dump trucks	
Level 1: Recall	CEII 4.4 List the operator inspection and maintenance requirements	
Level 2: Skill/Concept	CEII 4.5 Demonstrate safe driving practices for dump trucks	
Level 2: Skill/Concept	CEII 4.6 Perform basic operations using a dump truck	

Indicator #CEI 5: SKID STEER-Students understand and perform, where applicable, usage and proper functionality of skid steers.

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2: Skill/Concept	CEII 5.1 Operate a skid loader safely	
Level 1: Recall	CEII 5.2 Demonstrate the pre start inspection requirements for skid loader	
Level 2: Skill/Concept	CEII 5.3 Demonstrate startup, shutdown, and operations procedures for a skid loader	

Indicator #CEII 6: EXCAVATION DIMENSIONS-Students perform calculations to carry out excavation operations.

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 1: Recall	CEII 6.1 Explain and demonstrate the correct use of formulas for site layout	
Level 1: Recall	CEII 6.2 Understand the proper sequence of operations in a formula	
Level 1: Recall	CEII 6.3 Demonstrate understanding of different types of angles	
Level 2: Skill/Concept	CEII 6.4 Demonstrate how to calculate/estimate area and volume	

Indicator #CEII 7: INTERPRETING CIVIL DRAWINGS-Students read and interpret construction site drawings to perform operations.

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 2: Skill/Concept	CEII 7.1 Analyze types of drawings and prints used in equipment operations	
Level 2: Skill/Concept	CEII 7.2 Demonstrate the ability to read and interpret drawings	
Level 1: Recall	CEII 7.3 Define common abbreviations	
Level 1: Recall	CEII 7.4 Explain the purpose of the plan specifications for projects	
Level 1: Recall	CEII 7.5 Describe how as-built drawings are prepared	

Indicator #CEII 8: SITE WORK-Students perform appropriate on-site heavy equipment operations including interpreting grade stakes and controlling surface and ground and surface water at a worksite.

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 1: Recall	CEII 8.1 Explain the purpose of site safety	
Level 1: Recall	CEII 8.2 Understand the different types of sites and conditions (e.g. building site, highway site, etc.) and how they differ	

Indicator #CEII 6: EXCAVATION DIMENSIONS-Students perform calculations to carry out excavation operations.

<i>Webb Level</i>	<i>Sub-indicator</i>	<i>Integrated Content</i>
Level 1: Recall	CEII 9.1 Demonstrate the functions of various components of equipment	
Level 2: Skill/Concept	CEII 9.2 Demonstrate pre-start inspection requirements for various pieces of machinery	
Level 2: Skill/Concept	CEII 9.3 Demonstrate task-related work activities	