Scope and Sequence

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Cluster:	Architecture & Construction
Course Name:	Advanced Construction Technology (Two to Three Credits)
Course Description:	In Advanced Construction Technology, students gain knowledge and skills specific to those needed to enter the work force as carpenters building maintenance technicians, or supervisors or prepare for a postsecondary degree in construction management, architecture, or engineering. Students build on the knowledge base from Construction Technology and are introduced to exterior and interior finish out skills.
Course Requirements:	This course is recommended for students in Grades 11-12. Recommended prerequisites: Principles of Architecture and Construction and Construction Technology.
Equipment:	**Required:** Measuring tape, bench rule, zig zag rule, flexible tape, tri-square, combination square, sliding T-bevel, dividers, framing/rafter square, carpenter's level, marking gauge, scratch awl, trammer points, plumb bob and line, electronic calculator, back saw, hack saw, crosscut saw, drywall saw, finishing saw, rip saw, compass saw, keyhole saw, coping saw, dovetail saw, smooth plane, jack plane, fore plane, jointer plane, router plane, block plane, chisels, surform tools, hatchet, utility knife, vise, claw hammer, rip hammer, mallet, ripping bars, nail set, screwdrivers, staple gun, hammer tacker, auger bit, dowel bit, expansion bit, brace, Foerstner bit, bit or depth gauge, twist drill and bit stock drill, hand drill, automatic drill, metal working tools, cold chisel, adjustable wrench, open-end wrench, box wrench, socket wrench set, vise-grip wrench, combination pliers, long flat-nose pliers, box-joint pliers, power tools: portable circular saw, radial arm saw, miter saw, portable electric drill, cordless drill, pneumatic nailers and staplers, router, saber saw/jig saw, plate joiners, scaffolds and ladders, table saw, reciprocating saw, belt sander, finish sander, random-orbit sander, jointers, portable electric plane, air compressor, portable drum mixer, transit level, tin snips, tape measures, mud pan, pole sanders, mud mixers, tape dispensers, BANJO, nail spotter, bazooka.

Units of Study	Knowledge and Skills	Student Expectations	Resources
A. Commercial Drawings 1. Problem Solving	(1) The student is provided with the knowledge to interpret various types	(A) recognize the difference between commercial and residential construction drawings	NCCER:CFF2, Ch1

Units of Study	Knowledge and Skills	Student Expectations	Resources
2. Academic Links	of working drawings as they pertain to commercial construction.	(B) identify the basic keys, abbreviations, and other references contained in a set of commercial drawings (C) accurately read a set of commercial drawings (D) identify and document specific items from a door and window schedule (E) explain basic construction details and concepts employed in commercial construction (F) calculate the floor area of each room in a floor plan	
B. Roofing Applications 1. Safety 2. Math 3. Tools 4. Residential 5. Commercial 6. Thermal and Moisture Protection 7. Insulation Materials 8. Vapor Barriers and Waterproofing 9. Building Wraps	(2) The student selects and installs common roofing materials for residential and light commercial projects.	(A) identify the materials and methods used in roofing (B) explain the safety requirements for roof jobs (J) complete the cuts and install the main and hip ridge caps using wood shakes or shingles (K) demonstrate the techniques for installing other selected types of roofing materials	NCCER:CFF2, Ch2,3
	(3) The student selects and installs various types of insulation in walls, floors, and attics.	(A) describe the requirements for insulation (B) describe the characteristics of various types of insulation material (C) calculate the required amounts of insulation for a structure (D) install selected insulation materials (E) describe the requirements for moisture control and ventilation (F) install selected vapor barriers (G) describe various methods of waterproofing (H) describe air infiltration control requirements (I) install selected building wraps	
C. Exterior Finishing 1. Types of Sidings 2. Wood 3. Vinyl 4. Metal 5. Masonry	(4) The student learns the processes to install various exterior siding materials.	(A) describe the purpose of wall insulation and flashing (B) install selected common cornices (C) demonstrate lap and panel siding estimating methods (D) describe the types and applications of common wood siding (E) describe fiber-cement siding and its uses	NCCER:CFF2, Ch4

Units of Study	Knowledge and Skills	Student Expectations	Resources
		(F) describe the types and styles of vinyl and metal siding (G) describe the types and applications of stucco and masonry veneer finishes (H) install three types of siding commonly used in the local area	
D. Steel Framing 1. Identify Wall Components 2. Wall Layout 3. Wall Bracing 4. Problem Solving 5. Applications	(5) The student knows the types and grades of steel framing materials and the process for installation of metal framing for interior walls, exterior nonbearing walls, and partitions.	(A) identify the components of a steel framing system (B) identify and select the tools and fasteners used in a steel framing systems (C) identify applications for steel framing systems (D) demonstrate the ability to build back-to-back, box, and L-headers (E) layout and install a steel stud structural wall with openings to include bracing and blocking (F) layout and install a steel stud non-structural wall with openings to include bracing blocking	NCCER:CFF2, Ch5
E. Drywall Installation 1. Types of Drywall 2. Fasteners 3. Drywall Finishing 4. Drywall Tools 5. Levels of Finishing 6. Estimating Materials and Math 7. Problem Solving 8. Applications	(6) The student knows various types of gypsum drywall, their uses, and the fastening devices and methods used to install them.	(A) identify the different types of drywall and their uses (B) select the type and thickness of drywall required for specific installations (C) select fasteners for drywall installations (D) explain the fastener schedules for different types of drywall installations (E) perform single-layer and multi-layer drywall installations using different types of fastening systems, including nails, drywall screws, and adhesives (F) install gypsum drywall on steel studs (G) explain how soundproofing is achieved in drywall installations (H) estimate material quantities for a drywall installation	NCCER:CFF2, Ch6, 7 WEB10
	(7) The student knows the materials, tools, and methods used to finish and patch gypsum drywall.	(A) state the differences between the six levels of finish established by industry standards and distinguish a finish level by observation	

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		(B) identify the hand tools used in drywall finishing and demonstrate the ability to use these tools (C) identify the automatic tools used in drywall finishing (D) identify the materials used in drywall finishing and state the purpose and use of each type of material, including compounds, joint reinforcing tapes, trim materials, textures, and coatings (E) properly finish drywall using hand tools (F) recognize various types of problems that occur in drywall finishes (G) identify the causes and correct methods for solving each type of problem (H) patch damaged drywall	
F. Doors and Door Hardware 1. Interior/Exterior Types 2. Door Jambs 3. Hardware	(8) The student installs metal doors and related hardware in steel-framed, wood-framed, and masonry walls.	(A) 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 (B) identify different types of interior doors (C) identify different types of interior door hardware and demonstrate the installation procedures for selected types (D) list and identify specific items included on a typical door schedule (E) demonstrate the procedure for placing and hanging a selected door	NCCER:CFF2, Ch8
G. Suspended Ceilings 1. Types of Ceilings 2. Sound-Proof Ceilings 3. Problem-Solving 4. Math Links 5. Applications	(9) The student gains knowledge of the materials, layout, and installation of various types of suspended ceilings used in commercial construction as well as ceiling tiles, drywall suspension systems, and pan-type ceilings.	(A) establish a level line (B) explain the common terms related to sound waves and acoustical ceiling materials (C) identify the different types of suspended ceilings (D) interpret plans related to ceiling layout (E) sketch the ceiling layout for a basic suspended ceiling (F) install selected suspended ceilings	NCCER:CFF2, Ch9

Units of Study	Knowledge and Skills	Student Expectations	Resources
H. Finish Carpentry 1. Types of Moldings 2. Estimating Materials 3. Installing Trim	(10) The student knows the types of trim used in finish work.	(A) identify the different types of standard moldings and describe their uses (B) make square and miter cuts using a miter box or power miter saw (C) make coped joint cuts using a coping saw (D) select and properly use fasteners to install trim and install interior trim, including door trim, window trim, base trim, and ceiling trim (E) estimate the quantities of different trim materials required for selected rooms	NCCER:CFF2, Ch10
I. Cabinet fabrication and Installation 1. Parts of Cabinets 2. Hardware 3. Countertops and Laminates 4. Estimating Materials 5. Designing Cabinets 6. Math Links 7. Applications/Problem Solving	(11) The student selects and installs base and wall cabinets and countertops.	(A) state the classes and sizes of typical base and wall kitchen cabinets (B) identify cabinet components and hardware and describe their purposes (C) lay out factory-made cabinets, countertops, and backsplashes (D) explain the installation of an island base (E) recognize the common types of woods used to make cabinets (F) identify and cut the various types of joints used in cabinetmaking (G) build a cabinet from a set of drawings (H) install plastic laminate on a countertop core	NCCER:CFF2, Ch11,12

Resources:

Books:

ADD	0766815463, Cengage Learning Inc/Delmar Learning, *Architectural Drafting and Design,* 4E
ADLC	0131836943, Prentice Hall Inc., *Architectural Drawing and Light Construction*
ARDD	159070195X, The Goodheart-Willcox Company, *Architecture: Residential Drafting and Design*
CBC	007822702X, Glencoe/McGraw-Hill Division, *Carpentry and Building Construction*
NCCER:CF1	0132285916, Prentice Hall, *Carpentry Level 1 Fundamentals Trainee Guide* , 4E
NCCER:CFF2	0132285967, Prentice Hall, *Carpentry Level 2 Framing & Finishing Trainee Guide* , 4E
NCCER:CORE	0136086373, Prentice Hall, *Core Curriculum Trainee Guide* , 4E

Units of Study	Knowledge and Skills	Student Expectations	Resources
TTT	0078308291, Glencoe/McGraw-Hill Division, *Technology Today and Tomorrow*		

Websites

WEB1:	www.agc.org	American General Contractors of America
WEB2:	www.aia.org	American Institute of Architects
WEB3:	www.asaonline.com	American Subcontractors Associations
WEB4:	www.abc.org	Associated Builders and Contractors
WEB5:	www.nahb.org	National Association of Home Builders
WEB6:	www.osha.gov	Occupational Safety and Health Administration
WEB7:	www.skillsusa.org	Skills USA
WEB8:	www.texasarchitect.org	Texas Society of Architects
WEB9:	www.texasbuilders.org	Texas Association of Builders
WEB10:	www.USG.com	USG