

General Construction | Two-Year Program: Scope & Sequence

Year 1, Semester 1

GC101 General Construction I (18 Weeks)

District Pre-Assessment

Unit 1 - 1 Week (Days: 5c)

Lab and Classroom Rules & Employability Skills:

- Syllabus, Procedures, Rules
- Shop Orientation/tour

CTSO Introduction (Leadership Skills): Officer Elections, Officer Training.

Professional Skills: 6A-C, 8A-I

Academic Standards: ELA.11-12.W.4, ELA.11-12.W.5

Work-based Learning: Guest speaker

Technical Standard: 1.1-1.6

Unit 2 - 13 Weeks (Days: 25C/30L)

NCCER Core Curriculum:

- Build a future in construction: Understand the state of the industry, including sustainable building practices, the job opportunities that currently exist, and the training options that will lead you on a path to your new construction career.
- Construction Safety: Promote a culture of safety, hazard identification, safety planning, and compliance, and prevent workplace safety
- Construction Math: basic calculations, unit conversions, geometry, algebraic concepts, trigonometry, proportion and scale, and data analysis as it relates to the construction industry.
- Hand & Power Tools: identifying and explaining common hand tools and power tools such as hammers, screwdrivers, wrenches, pliers, drills, and saws.
- Construction Drawings: Various types of construction drawings are used to represent actual components of a building project. Understand common types of construction drawings, their basic components, standard drawing elements, and measurement tools that are typically used when working with construction drawings.
- Rigging: prevent personnel injury, ensure safe equipment usage, prioritize load safety, promote clear communication, equipment inspection, load control, safe operating distances, and environmental awareness.
- Communication & Employability skills: communication, teamwork, professionalism, work ethic, and reliability as well as expression, active listening, read and write effectively for job performance, and use of digital communication tools.

CTSO Integration (Leadership Skills): SkillsUSA Officer

Training, Officer Elections, Chapter Meetings

Professional Skills: 1.A-D, 2.A-C, 3.A-E, 4.A-F, 5.A-E, 6.A-C, 7.A-C, 8.A-I, 9.A-C

Academic Standards: ELA.11-12.W.4, ELA.11-12.W.5, ELA.11-12.SL.4, ELA.11-12.SL.6, ELA.11-12.RI.2

Work-Based Learning: Guest Speaker, job application (resume)

Technical Standard: 1.1-1.6, 2.1-2.12, 3.1-3.8, 4.1-4.3, 9.1

Certification: OSHA 10, NCCER Core

Unit 3 - 2 Weeks (Days: 10C/20L)

Masonry:

- Masonry materials, tools, techniques, and safety precautions.
- Mix mortar by hand and lay masonry units
- Describes the skills, attitudes, and abilities of successful masons.
- Characteristics of block and brick; how to set up, lay out, and bond block and brick; how to cut block and brick; how to lay and tool block and brick; and how to clean block and brick once they have been laid.
- Describe masonry reinforcements and accessories used to lay block and brick professionally and safely.

CTSO Integration (Leadership Skills): AZ Masonry Expo, AZ Construction Expo, Chapter Meeting, SkillsUSA Fall Leadership Conference

Work-Based Learning: Industry current events, Integrated project with industry partner (AZ Masonry Council), guest speaker, virtual exchange with partner, simulated lab experiences (brick laying, mortar mixing etc.)

Professional Skills: 1.A-D, 2.A-C, 3.A-E, 4.A-F, 5.A-E, 6.A-C, 7.A-C, 8.A-I, 9.A-C

Academic Standards: ELA.11-12.L.4, ELA.11-12.RI.2, ELA.11-12.SL.3, ELA.11-12.SL.4, 5.NF.B.3, 5.NF.B.6, 5.NF.B.7, 6.RP.A.3, 7.EE.B.3, 7.RP.A.3, 7.G.B.4, 8.G.B.7, G-GMD.A.3

Technical Standard: 5.1-5.10

Semester Exam

Year 1, Semester 2

GC102 General Construction II (18 Weeks)

Unit 4 - 3 Weeks (Days: 5C/10L)

Concrete:

- Identify uses of concrete
- Understand job specifications for the material needed to form, scaffold, and place concrete
- Explain the ingredients of concrete
- Identify equipment and tools for moving and handling concrete
- Mix, convey, and finish concrete
- Explain the concrete leveling process

CTSO Integration (Leadership Skills): Chapter Meeting

Professional Skills: 1.A-D, 2.A-C, 3.A-E, 4.A-F, 5.A-E, 6.A-C, 7.A-C, 8.A-I, 9.A-C

Academic Standards: ELA.11-12.W.5, ELA.11-12.L.4, ELA.11-12.RI.2, 5.NF.B.3, 5.NF.B.6, 5.NF.B.7, 6.RP.A.3, 7.EE.B.3, 7.RP.A.3, 7.G.B.4, 8.G.B.7, G-GMD.A.3

Work-Based Learning: Field Trip

Technical Standard: 15.1-15.7

Unit 5 - 3 Weeks (Days: 6C/9L)

Floor Systems:

- Covers framing basics and the procedures for laying out and constructing a wood floor using common lumber, as well as engineered building materials.
- Identify floor plans and types and fasteners used in floor systems.

Work-Based Learning: Guest Speaker - framing

CTSO Integration (Leadership Skills): SkillsUSA Competition

Preparation, Chapter Meeting

Work-Based Learning: Industry current events

Professional Skills: 1.A-D, 2.A-C, 3.A-E, 4.A-F, 5.A-E, 6.A-C, 7.A-C, 8.A-I, 9.A-C

Academic Standards: ELA.11-12.L.4, ELA.11-12.RI.2, 5.NF.B.3, 5.NF.B.6, 5.NF.B.7, 6.RP.A.3, 7.EE.B.3, 7.RP.A.3, 7.G.B.4, 8.G.B.7, G-GMD.A.3

Work-Based Learning: Career Fair

Technical Standard: 6.1-6.5, 6.8-9

Unit 6 - 3 Weeks (Days: 6C/9L)

Wall Systems:

- Describes procedures for laying out and framing walls, including roughing-in door and window openings, constructing corners, partition Ts, and bracing walls. Includes the procedure to estimate the materials required to frame walls.
- Assemble wood and metal stud walls
- Assemble, erect, and brace exterior walls for a framed building

CTSO Integration (Leadership Skills): Chapter Meeting

Work-Based Learning: Industry current events

Professional Skills: 1.A-D, 2.A-C, 3.A-E, 4.A-F, 5.A-E, 6.A-C, 7.A-C, 8.A-I, 9.A-C

Academic Standards: ELA.11-12.L.4, ELA.11-12.RI.2, 5.NF.B.3, 5.NF.B.6, 5.NF.B.7, 6.RP.A.3, 7.EE.B.3, 7.RP.A.3, 7.G.B.4, 8.G.B.7, G-GMD.A.3

Work-Based Learning: Field trip

Technical Standard: 7.1-7.7, 9.2-9.6

Unit 7 - 6 Weeks (Days: 15C/20L)

Ceiling Joist, Roof Framing and Applications:

- Identify ceiling components and accessories
- Calculate the amount of material needed to frame a ceiling
- Layout and construct a ceiling framing
- Describes types of roofs and provides instructions for laying out rafters for gable roofs, hip roofs, and valley intersections. Covers stick-built and truss-built roofs. Includes the basics of roof sheathing installation.
- Describes how to properly prepare the roof deck and install roofing for residential and commercial buildings.

CTSO Integration (Leadership Skills): Chapter Meeting

Work-based Learning: Truss plant field trip

Professional Skills: 1.A-D, 2.A-C, 3.A-E, 4.A-F, 5.A-E

Academic Standards: ELA.11-12.W.6, ELA.11-12.L.4, ELA.11-12.RI.2, ELA.11-12.SL.3, 5.NF.B.3, 5.NF.B.6, 5.NF.B.7, 6.RP.A.3, 7.EE.B.3, 7.RP.A.3, 7.G.B.4, 8.G.B.7, G-GMD.A.3

Work-Based Learning: mock interview, job app resume, job shadow, guest speaker

Technical Standard: 6.6-6.8, 6.10, 8.1-8.9, 9.2-9.6

Unit 8 - 3 Weeks (Days: 6C/9L)

Exterior Finish:

- Covers the various types of exterior finish materials and their installation procedures, including wood, metal, vinyl, and fiber-cement siding.
- Explain the functional and aesthetic purposes of exterior finishes
- Apply exterior finishes according to the plan

CTSO Integration (Leadership Skills): SkillsUSA Region 5

Conference, Chapter Meeting

Professional Skills: 1.A-D, 2.A-C, 3.A-E, 4.A-F, 5.A-E, 6.A-C, 7.A-C, 8.A-I, 9.A-C

Academic Standards: ELA.11-12.L.4, ELA.11-12.RI.2, 5.NF.B.3, 5.NF.B.6, 5.NF.B.7, 6.RP.A.3, 7.EE.B.3, 7.RP.A.3, 7.G.B.4, 8.G.B.7, G-GMD.A.3

Work-Based Learning: guest speaker

Technical Standard: 10.1-10.6, 9.2-9.6

District Post-Assessment

Year 2, Semester 1

GC201 - General Construction III (18 Weeks)

Unit 1 - 1 Week (Days: 5c)

Lab and Classroom Safety, Rules & Employability Skills:

- Syllabus, Procedures, Rules
- Shop Orientation

CTSO Introduction (Leadership Skills): Officer Elections, Officer Training

Professional Skills: 6A-C, 8A-I

Academic Standards: ELA.11-12.W.4, ELA.11-12.W.5

Work-based Learning: Guest speaker

Technical Standard: 1.1-1.6

Unit 2 - 4 Weeks (Days: 10C/10L)

Interior Finish and Trim Plus Stairs:

- Introduces stair types and common building code requirements for stairs. Focuses on techniques for measuring and calculating rise, run, and stairwell openings, laying out stringers, and fabricating basic stairways.
- Identify wall and ceiling finishes and finishing tools
- Demonstrate techniques for handling, staging, storing, and cutting drywall and drywall finishing techniques
- Interior trim: identify types of millwork, define interior trim, and install different types of interior trim

CTSO Integration (Leadership Skills): Chapter Meeting

Professional Skills: 1.A-D, 2.A-C, 3.A-E, 4.A-F, 5.A-E, 6.A-C, 7.A-C, 8.A-I, 9.A-C

Academic Standards: ELA.11-12.W.5, ELA.11-12.L.4, ELA.11-12.RI.2, 5.NF.B.3, 5.NF.B.6, 5.NF.B.7, 6.RP.A.3, 7.EE.B.3, 7.RP.A.3, 7.G.B.4, 8.G.B.7, G-GMD.A.3 Work-Based Learning: Field Trip

Technical Standard: 11.1-11.7, 14.1-14.6

Unit 3 - 5 Weeks (Days: 10C/15L)

Electrical Safety & Residential Electrical Services:

- Covers safety rules and regulations for electricians, including precautions for electrical hazards found on the job. Covers the OSHA-mandated lockout/ tagout procedure.
- Covers the electrical devices and wiring techniques common to residential construction and maintenance. Allows trainees to practice making service calculations. Stresses the applicable NEC® requirements.

CTSO Integration (Leadership Skills): Chapter Meeting

Professional Skills: 1.A-D, 2.A-C, 3.A-E, 4.A-F, 5.A-E, 6.A-C, 7.A-C, 8.A-I, 9.A-C

Academic Standards: ELA.11-12.W.5, ELA.11-12.L.4, ELA.11-12.RI.2, 5.NF.B.3, 5.NF.B.6, 5.NF.B.7, 6.RP.A.3, 7.EE.B.3, 7.RP.A.3, 7.G.B.4, 8.G.B.7, G-GMD.A.3

Work-Based Learning: Field Trip

Technical Standard: 13.1-13.9

Unit 4 - 2 Weeks (Days: 4C/6L)

Introduction to HVAC:

- Covers the basic principles of heating, ventilating, and air conditioning, career opportunities in HVAC, and how apprenticeship programs are constructed.
- Basic safety principles, as well as trade licensure and EPA guidelines

CTSO Integration (Leadership Skills): Chapter Meeting

Professional Skills: 1.A-D, 2.A-C, 3.A-E, 4.A-F, 5.A-E, 6.A-C, 7.A-C, 8.A-I, 9.A-C

Academic Standards: ELA.11-12.W.5, ELA.11-12.L.4, ELA.11-12.RI.2, 5.NF.B.3, 5.NF.B.6, 5.NF.B.7, 6.RP.A.3, 7.EE.B.3, 7.RP.A.3, 7.G.B.4, 8.G.B.7, G-GMD.A.3 Work-Based Learning: Field Trip

Technical Standard: NA

Unit 5 - 2 Weeks (Days: 4C/6L)

Introduction to Drain, Waste, and Vent (DWV) Systems:

- Explains how DWV systems remove waste safely and effectively. Discusses how system components, such as pipe, drains, traps, and vents work.
- Reviews drain and vent sizing, grade, and waste treatment.
- Discuss how building sewers and sewer drains connect the DWV system to the public sewer system.

CTSO Integration (Leadership Skills): Chapter Meeting

Professional Skills: 1.A-D, 2.A-C, 3.A-E, 4.A-F, 5.A-E, 6.A-C, 7.A-C, 8.A-I, 9.A-C

Academic Standards: ELA.11-12.W.5, ELA.11-12.L.4, ELA.11-12.RI.2, 5.NF.B.3, 5.NF.B.6, 5.NF.B.7, 6.RP.A.3, 7.EE.B.3, 7.RP.A.3, 7.G.B.4, 8.G.B.7, G-GMD.A.3

Work-Based Learning: Field Trip

Technical Standard: 12.1-12.8

Unit 6 - 2 Weeks (Days: 4C/6L)

Plastic Pipe and Fittings:

- Different types of plastic pipe and fittings used in plumbing applications, including ABS, PVC, CPVC, PE, PEX, and PB.
- Describe how to measure, cut, join, and support plastic pipe according to the manufacturer's instructions and applicable codes.
- Discuss pressure testing of plastic pipe once installed.

CTSO Integration (Leadership Skills): Chapter Meeting

Professional Skills: 1.A-D, 2.A-C, 3.A-E, 4.A-F, 5.A-E, 6.A-C, 7.A-C, 8.A-I, 9.A-C

Academic Standards: ELA.11-12.W.5, ELA.11-12.L.4, ELA.11-12.RI.2, 5.NF.B.3, 5.NF.B.6, 5.NF.B.7, 6.RP.A.3, 7.EE.B.3, 7.RP.A.3, 7.G.B.4, 8.G.B.7, G-GMD.A.3

Work-Based Learning: Field Trip

Technical Standard: 12.1-12.8

Unit 7 - 2 Weeks (Days: 4C/6L)

Copper Pipe and Fittings:

- Discuss sizing, labeling, and applications of copper pipe and fittings, and reviews the types of valves that can be used on copper pipe systems.
- Explain proper methods for cutting, joining, and installing copper pipe.
- Address insulation, pressure testing, seismic codes, and handling and storage requirements.

CTSO Integration (Leadership Skills): Chapter Meeting

Professional Skills: 1.A-D, 2.A-C, 3.A-E, 4.A-F, 5.A-E, 6.A-C, 7.A-C, 8.A-I, 9.A-C

Academic Standards: ELA.11-12.W.5, ELA.11-12.L.4, ELA.11-12.RI.2, 5.NF.B.3, 5.NF.B.6, 5.NF.B.7, 6.RP.A.3, 7.EE.B.3, 7.RP.A.3, 7.G.B.4, 8.G.B.7, G-GMD.A.3

Work-Based Learning: Field Trip

Technical Standard: 12.1-12.8

Year 2, Semester 2

GC202 - General Construction IV (18 Weeks)

Unit 7 - 4 Weeks (Days: 10C/10L)

Cabinetmaking and Cabinet Installation:

- Construct and apply finishes to custom cabinetry. It identifies and discusses various types of wood products, wood-joining techniques, power tools, cabinet doors, shelves, and hardware.
- Specific guidance is also provided for the installation of laminated countertops.
- Selection and installation of base and wall cabinets and countertops.

CTSO Integration (Leadership Skills): Chapter Meeting

Professional Skills: 1.A-D, 2.A-C, 3.A-E, 4.A-F, 5.A-E, 6.A-C, 7.A-C, 8.A-I, 9.A-C

Academic Standards: ELA.11-12.W.5, ELA.11-12.L.4, ELA.11-12.RI.2, 5.NF.B.3, 5.NF.B.6, 5.NF.B.7, 6.RP.A.3, 7.EE.B.3, 7.RP.A.3, 7.G.B.4, 8.G.B.7, G-GMD.A.3

Work-Based Learning: Field Trip

Technical Standard: NA

Unit 8 - 14 Weeks (Days: 30C/40L)

Construction Real-World Project:

- Demonstrate mastery of knowledge and skills acquired throughout the Construction program
- Apply real-world construction techniques to design, plan, and build a project from start to finish
- Showcase safety, craftsmanship, project management, and professional communication skills
- Present a completed product and reflective portfolio to instructors, peers, and industry partners

CTSO Integration (Leadership Skills): Chapter Meeting

Professional Skills: 1.A-D, 2.A-C, 3.A-E, 4.A-F, 5.A-E, 6.A-C, 7.A-C, 8.A-I, 9.A-C

Academic Standards: ELA.11-12.W.5, ELA.11-12.L.4, ELA.11-12.RI.2, 5.NF.B.3, 5.NF.B.6, 5.NF.B.7, 6.RP.A.3, 7.EE.B.3, 7.RP.A.3, 7.G.B.4, 8.G.B.7, G-GMD.A.3

Work-Based Learning: Field Trip

Technical Standard: All Standards

Certification: NCCER Construction Technologies ADE Technical Skills Assessment

Arizona Department of Education (ADE) Common AZCCR Math Standards (CAMS) English Language Arts Standards (ELAS)
National Center for Construction Education and Research (NCCER)