# Scope & Sequence

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| Course Name: Construction Technology II **TSDS PEIMS Code:** 13005200 | | | **Course Credit:** 2.0  **Course Requirements:** This course is recommended for students in Grades 11-12.  **Prerequisites:** Construction Technology I. |
| **Course Description:** In Construction Technology II, students will gain advanced knowledge and skills needed to enter the workforce as carpenters, building maintenance technicians, or supervisors or to prepare for a postsecondary degree in construction management, architecture, or engineering. Students will build on the knowledge base from Construction Technology I and are introduced to exterior and interior finish out skills. For safety and liability considerations, limiting course enrollment to 15 students is recommended. | | | |
| **NOTE:** This is a suggested scope and sequence for the course content. This content will work with any textbook or instructional materials. If locally adapted, make sure all TEKS are covered. | | | |
| **Total Number of Periods**  **Total Number of Minutes**  **Total Number of Hours** | 350 Periods  15,750 Minutes  262.5 Hours\* | \*Schedule calculations based on 175/180 calendar days. For 0.5 credit courses, schedule is calculated out of 88/90 days. Scope and sequence allows additional time for guest speakers, student presentations, field trips, remediation, extended learning activities, etc. | |
| **Unit Number, Title, and Brief Description** | **# of Class Periods\***  (assumes 45-minute periods)  Total minutes per unit | **TEKS Covered**  **130.48 Knowledge and Skills** | |
| **Unit 1: Drafting and Design**  Students will differentiate between the different building trades’ plans and specifications. Students will demonstrate the use of the alphabet of lines and read and interpret basic codes. Students will compare differences in symbols and abbreviations between the building trades including electrical, mechanical, and plumbing. Students will read and interpret plans, elevations, schedules, sections, and details contained on basic construction drawings. Students will develop a materials takeoff based on architectural, engineering, and shop drawings. Students will be able to calculate square-footage of different rooms included on a floor plan. | 30 Periods  1,350 Minutes | 2. The student is provided with the knowledge to interpret various types of working drawings as they pertain to commercial construction. The student is expected to:  (A) recognize the difference between commercial and residential construction drawings;  (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; and  (F) calculate the floor area of each room in a floor plan | |
| **Unit 2: Steel Framing**  Students will identify the components of steel framing including vertical steel columns, horizontal I-beams, etc. Students will plan, lay out, assemble, erect, and brace steel structural wall(s) with openings including studs, tracks, U-channels, furring channels, back-to-back, box, L-headers, bracing and blocking using appropriate fasteners such as bolts and threaded fasteners. | 30 Periods  1,350 Minutes | 6. The student knows the types and grades of steel framing materials and the process for installing metal framing for interior walls, exterior nonbearing walls, and partitions. The student is expected to:  (A) identify the components of a steel framing system;  (B) identify and select the tools and fasteners used in a steel framing system;  (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; and  (F) layout and install a steel-stud, non-structural wall with openings to include bracing and blocking | |
| **Unit 3: Roofing**  Students will identify the common materials used to install roofing on gable and hip roofs such as shingles, underlayment, flashing, etc. Students will demonstrate layout, proper cutting, and safe installation of fiberglass and wood shingles on gable and hip roofs including main and hip ridge caps, and a cricket or saddle. Students will learn how to close up valleys and make roofs watertight. | 30 Periods  1,350 Minutes | 3. The student selects and installs common roofing materials for residential and light commercial projects. The student is expected to:  (A) identify the materials and methods used in roofing;  (B) explain the safety requirements for roof jobs;  (C) install fiberglass shingles on gable and hip roofs;  (D) close a valley using fiberglass shingles;  (E) explain how to make various roof projections watertight when using fiberglass shingles;  (F) complete the proper cuts and install the main and hip ridge caps using fiberglass shingles;  (G) lay out, cut, and install a cricket or saddle;  (H) install wood shingles and shakes on roofs;  (I) describe how to close up a valley using wood shingles and shakes;  (J) complete the cuts and install the main and hip ridge caps using wood shakes or shingles; and  (K) demonstrate the techniques for installing other selected types of roofing materials | |
| **Unit 4: Insulation, Vapor Barriers, and Waterproofing**  Students will summarize basic principles of air leakage and identify typical air leakage sites in walls, floors, and attics. Students will describe how to stop air leaks utilizing different types of insulation including rigid boards, loose fill, blankets, and foam plastics. Students will explain how to compare insulating materials using the R-value; the higher the R value the better the quality of the insulation. Students will explain the installation and cost of insulation and be able to analyze the amount of insulation to use depends on the geographical area and local utility prices. Students will learn that vapor barriers and house wraps are a critical part of controlling moisture and air flow if selected and installed properly and can help conserve energy, prevent mold growth and maintain the structural integrity. | 30 Periods  1,350 Minutes | 4. The student selects and installs various types of insulation in walls, floors, and attics. The student is expected to:  (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; and  (I) install selected building wraps | |
| **Unit 5: Gypsum Drywall Installation**  Students will gain knowledge about the different types of drywall including square-edged, taper edged, moisture-resistant, foil-backed, fire-resistant, abuse resistant, and soundproof. Students will demonstrate the ability to install drywall in the appropriate order using proper fastening systems including nails, drywall screws, and adhesives. Students will select the type and thickness of drywall required for specific installations and estimate material quantities for the installation. | 30 Periods  1,350 Minutes | 7. The student knows various types of gypsum drywall and their uses and the fastening devices and methods used to install them. The student is expected to:  (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; and  (H) estimate material quantities for a drywall installation | |
| **Unit 6: Gypsum Drywall Finishing**  Students will be able to identify the materials used for drywall finishing including compounds, joint reinforcing tapes, trim materials, textures, and coatings. Students will demonstrate the use of hand and automatic tools in drywall finishing. Students will compare and contrast between the six levels of drywall finish (0-5) established by industry standards. Students will recognize various types of problems that occur in drywall finishing such as over sanding, screws driven too far, joint issues, etc. Students will be able to problem solve to make proper repairs to drywall finishing problems. | 30 Periods  1,350 Minutes | 8. The student knows the materials, tools, and methods used to finish and patch gypsum drywall. The student is expected to:  (A) state the differences between the six levels of finish established by industry standards and distinguish between finish levels by observation;  (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) finish drywall using hand tools;  (F) recognize various types of problems that occur in drywall finishes and identify their causes;  (G) identify the correct methods for solving each type of problem that occurs in drywall finishes; and  (H) patch damaged drywall | |
| **Unit 7: Exterior Siding**  Students will demonstrate knowledge of products and materials used in exterior finishing by being able to describe the types and applications of common exterior siding materials including lap and panel siding, fiber-cement siding, wood siding, vinyl and metal siding, stucco, and masonry veneer. Students will demonstrate the ability to install exterior siding through proper measuring, laying-out, cutting, and installation in the appropriate order using necessary fastening systems including nails, screws, and adhesives. | 30 Periods  1,350 Minutes | 5. The student learns the processes to install various exterior siding materials. The student is expected to:  (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;  (F) describe the types and styles of vinyl and metal siding;  (G) describe the types and applications of stucco and masonry veneer finishes; and  (H) install three types of siding commonly used in the local area | |
| **Unit 8: Metal Doors**  Students will compare and contrast various types of door jambs and frames for different interior doors such as swinging door, bi-fold door, by-pass sliding door, pocket sliding door, etc. Students will demonstrate knowledge and ability to install interior door units and door hardware including verifying the framed door opening for square and plumb before starting the process of installation. Students will interpret a typical door schedule to include door(s), frame(s), glazing, hardware, sizes, configurations, materials, fire resistance ratings, etc. | 30 Periods  1,350 Minutes | 9. The student installs metal doors and related hardware in steel-framed, wood-framed, and masonry walls. The student is expected to:  (A) identify various types of door jambs and frames;  (B) demonstrate the installation procedures for placing door jambs and frames in different types of interior partitions;  (C) identify different types of interior doors;  (D) identify different types of interior door hardware and demonstrate the installation procedures for them;  (E) list and identify items included on a typical door schedule; and  (F) demonstrate the procedure for placing and hanging a door | |
| **Unit 9: Suspended Ceilings**  Identify the different types of suspended ceilings including exposed/lay-in grid, concealed grid, semi-concealed grid, open cell, bespoke metal, etc. Students will demonstrate knowledge and ability to install a suspended ceiling system from a sketch or engineering drawing as well as create a material takeoff from the plans. | 30 Periods  1,350 Minutes | 10. 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. The student is expected to:  (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; and  (F) install selected suspended ceilings | |
| **Unit 10: Trim and Finish Work**  Students will demonstrate knowledge and ability to install window, door, floor, and ceiling trim in the appropriate order using necessary fastening systems including nails, screws, or adhesives. Students will identify the different types of standard moldings such as decorative, casing, crown, chair rail, picture rail, cove, dentil, egg and dart, batten, bead/pearl, etc. and describe their functionality and uses. Students will demonstrate proper and safe use of a miter box and/or miter saw to make square and miter cuts and coping saw to make coped joint cuts. | 30 Periods  1,350 Minutes | 11. The student knows the types of trim used in finish work. The student is expected to:  (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 use fasteners to install trim, including door trim, window trim, base trim, and ceiling trim; and  (E) estimate the quantities of different trim materials required for selected rooms | |
| **Unit 11: Cabinets and Countertops**  Students will differentiate between the classes and sizes of typical cabinetry such as stock, semi-custom, and custom. Students will recognize the common types of woods and materials used to make cabinets. Students will familiarize themselves with cabinetry terminology for easy identification of cabinetry components including hardware, drawers, doors, etc. Students will learn how to prepare and apply laminate to a countertop through proper lay out, cutting and installation techniques. | 30 Periods  1,350 Minutes | 12. The student selects and installs base and wall cabinets and countertops. The student is expected to:  (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; and  (H) install plastic laminate on a countertop core | |
| **Unit 12: Employability Skills**  This unit explores the professional standards and employability skills required by business and industry. Students will grow to understand that responsibility, time management, organization, positive attitude, and good character have a large impact on employability and job retention.  Students will learn about the types of technology required to perform workplace tasks in the Architecture and Construction industry; students will understand how computerized systems are integral to businesses’ effectiveness and completing workplace tasks with accuracy and efficiency. | 20 Periods  900 Minutes | 1. The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:  (A) explain the role of an employee in the construction industry;  (B) demonstrate critical-thinking skills;  (C) demonstrate the ability to solve problems using critical-thinking skills;  (D) demonstrate knowledge of basic computer systems;  (E) explain common uses for computers in the construction industry;  (F) define effective relationship skills; and  (G) recognize workplace issues such as sexual harassment, stress, and substance abuse | |