

# CONSTRUCTION TRADES TECHNOLOGY (CTT)

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## CTT F100 Construction Technology Core

3 Credits

Offered As Demand Warrants

Basic construction techniques using OSHA approved standards by stressing how to follow safe work practices and procedures, how to safely use hand and power tools, how to extract information from construction blueprints and drawings, good housekeeping habits, and material handling on the construction site. This course is divided into six modules. Each module must be successfully completed. May be repeated twice for credit. (Alternative: CTT F101; CTT F102; CTT F103; CTT F104.)

**Lecture + Lab + Other:** 2.5 + 1.5 + 0

## CTT F101 Basic Construction Safety

1 Credit

Offered As Demand Warrants

Introduction to basic construction safety using OSHA approved standards. Focus is on safe work practices and procedures, the proper inspection of safety equipment before use and the proper use of safety equipment. (Alternative to CTT F100 when taken with CTT F102; CTT F103; CTT F104.)

**Lecture + Lab + Other:** 1 + 0.5 + 0

## CTT F102 Introduction to Hand and Power Tools

1 Credit

Offered As Demand Warrants

Introduction to basic hand and power tools used in construction and maintenance and the importance of their care and use. Valuable safety information for each type of tool is discussed. Understanding proper usage helps trainees to prevent accidents. Some specialty tools used by different crafts are also introduced. (Alternative to CTT F100 when taken with CTT F101; CTT F103; CTT F104.)

**Prerequisites:** CTT F101.

**Lecture + Lab + Other:** 0.5 + 1 + 0

## CTT F103 Introduction to Blueprint Reading

1 Credit

Offered As Demand Warrants

Introduction to basic blueprint terms, components and symbols. Different types of construction drawings commonly used on job sites and why each type of drawing is important will be presented. Standardized information contained on blueprints such as identification, revision status, symbols, project titles, dimension and scale will be covered. (Alternative to CTT F100 when taken with CTT F101; CTT F102; CTT F104.)

**Prerequisites:** CTT F102.

**Lecture + Lab + Other:** 1 + 1 + 0

## CTT F104 Basic Communication and Employability Skills

2 Credits

Offered As Demand Warrants

Techniques for communicating effectively with co-workers and supervisors. Includes critical thinking and problem-solving skills and reviews effective relationship skills, effective presentation and key workforce issues such as sexual harassment, stress and substance abuse. (Alternative to CTT F100 when taken with CTT F101; CTT F102; CTT F103.)

**Prerequisites:** CTT F103.

**Lecture + Lab + Other:** 2 + 0 + 0

## CTT F106 Construction Measuring

3 Credits

Offered As Demand Warrants

Introduction to basic mathematical procedures commonly used in the construction and maintenance crafts. Includes multiplication, subtraction, addition, division, working with fractions and measuring areas, volume and capacity of shapes.

**Lecture + Lab + Other:** 3 + 0 + 0

## CTT F110 Residential Carpentry I

8.5 Credits

Offered As Demand Warrants

Introduction to basic materials and framing techniques used in the construction trades. Includes an orientation, introduction to materials and advanced tools used in the trades. Includes techniques used in framing a structure and to exterior doors and windows commonly installed on construction projects and their proper installation. This course is divided into seven modules. Each module must be successfully completed. (Alternative: CTT F111; CTT F112; CTT F113; CTT F114.)

**Prerequisites:** CTT F100.

**Lecture + Lab + Other:** 5 + 7 + 0

## CTT F111 Materials and Tools Used in the Trade

2.5 Credits

Offered As Demand Warrants

Examines the sources and uses of various softwoods and hardwoods, the grading system for lumber and plywood, composition and uses of various engineered sheet materials and laminated lumber products and the many kinds of fasteners and adhesives used with wood and masonry construction. Expands on the hand and power tool information provided in the construction technology core and introduces the carpentry trainee to additional tools used in the carpentry trade. (Alternative to CTT F110 when taken with CTT F112; CTT F113; CTT F114.)

**Prerequisites:** CTT F100.

**Lecture + Lab + Other:** 2 + 1 + 0

## CTT F112 Floor Systems, Wall and Ceiling Framing

2 Credits

Offered As Demand Warrants

Focuses on framing basics. Includes the procedures for laying out and constructing a wood floor using common lumber as well as engineered building materials, procedures for laying out and framing walls and ceilings, roughing in doors and window openings, construction corners and partition Ts, bracing walls and ceilings, and applying sheathing. (Alternative to CTT F110 when taken with CTT F111; CTT F113; CTT F114.)

**Prerequisites:** CTT F111.

**Lecture + Lab + Other:** 1 + 2 + 0

## CTT F113 Roof Framing, Windows and Exterior Doors

2 Credits

Offered As Demand Warrants

Describes the various kinds of roofs and instructions for laying out rafters for gable roof, hip roof and valley intersections. Includes both stick built and truss built roofs, various types of windows, skylights, exterior doors, and instructions for installing weather stripping and lock sets. (Alternative to CTT F110 when taken with CTT F111; CTT F112; CTT F114.)

**Prerequisites:** CTT F112.

**Lecture + Lab + Other:** 1 + 2 + 0

**CTT F114 Introduction to Concrete Materials and Forms**

2 Credits

Offered As Demand Warrants

Introduction to various cements and other materials which when mixed form various types of concrete. Includes concrete volume estimates, concrete tests, concrete curing methods, reinforcement materials such as rebar, bar supports and welded-wire fabric and tasks in the construction of foundations and flat work. (Alternative to CTT F110 when taken with CTT F111; CTT F112; CTT F113.)

**Prerequisites:** CTT F113.**Lecture + Lab + Other:** 1 + 2 + 0**CTT F115 Residential Carpentry--Level II**

12 Credits

Offered As Demand Warrants

This course builds upon the skills learned in CTT F110. Includes methods and techniques used to locate structures and install exterior siding and related element protection. Various types of roofing and installation of those materials, types and methods of drywall and its installation and interior finish applications. This course is divided into eleven modules. Each module must be successfully completed. (Alternative: CTT F116; CTT F117; CTT F118; CTT F119.)

**Prerequisites:** CTT F110.**Lecture + Lab + Other:** 6 + 12 + 0**CTT F116 Reading Plans and Site Layout--Level I**

2 Credits

Offered As Demand Warrants

This course builds upon CTT F110. Introduces the principles, equipment and methods used to perform site layout tasks of distance measurements, differential leveling and the site layout responsibilities of individuals on the site. (Alternative to CTT F115 when taken with CTT F117; CTT F118; CTT F119.)

**Prerequisites:** CTT F110.**Lecture + Lab + Other:** 1 + 2 + 0**CTT F117 Exterior Finish and Moisture Protection**

2 Credits

Offered As Demand Warrants

Introduction to materials and installation techniques used in various types of siding. Includes the installation procedures and basic requirements for insulation, moisture control and ventilation. (Alternative to CTT F115 when taken with CTT F116; CTT F118; CTT F119.)

**Prerequisites:** CTT F116.**Lecture + Lab + Other:** 1 + 2 + 0**CTT F118 Roofing, Stairs and Metal Studs Applications**

3 Credits

Offered As Demand Warrants

Introduction to materials and installation techniques for a number of basic types of roofing. Includes installation techniques of stairs and metal studs. (Alternative to CTT F115 when taken with CTT F116; CTT F117; CTT F119.)

**Prerequisites:** CTT F117.**Lecture + Lab + Other:** 2 + 2 + 0**CTT F119 Drywall and Interior Finish Applications**

5 Credits

Offered As Demand Warrants

Introduction to materials, tools and procedures used to install and finish gypsum drywall on walls and ceilings and to correct drywall finishing problems. Includes installation of various types of doors and their related hardware in several types of walls, materials, tools and procedures used to lay out, install, and maintain suspended ceilings and the different types of trim. (Alternative to CTT F115 when taken with CTT F116; CTT F117; CTT F118.)

**Prerequisites:** CTT F118.**Lecture + Lab + Other:** 2 + 6 + 0**CTT F121 Train the Trainer**

2 Credits

Journey persons are needed to transfer their skills to younger workers and this program will provide the skilled person with an intense series of discussions related to teaching strategies, classroom management and leadership, group dynamics and evaluation of training. Program completers may qualify for adjunct status with UAF.

**Prerequisites:** Skilled journey person in specific skill area.**Lecture + Lab + Other:** 2 + 0 + 0**CTT F130 Introduction to Facility Maintenance**

1 Credit

Offered As Demand Warrants

Introduction to building systems and different types of building maintenance; deferred, preventative, emergency, proactive and reactive. Provides students with basic safety instruction of hand and power tools and chemicals used in the facility maintenance occupation in accordance with Federal OSHA regulations. Instruction in Personal Protective Equipment (PPE) requirements.

**Lecture + Lab + Other:** 1 + 0 + 0**CTT F131 Interior Repairs**

1 Credit

Offered As Demand Warrants

Provides students with basic skills needed to install and repair drywall. Students will learn how to identify components of drywall assembly and identify tools and fasteners needed to install drywall. Students will identify different materials and proper tools needed in drywall finishing.

**Lecture + Lab + Other:** 1 + 0 + 0**CTT F132 Flooring Installation**

1 Credit

Offered As Demand Warrants

Introduces students to concepts and practical applications of floor coverings. Students will learn how to install underlayment, floor coverings and trim. Introduction to special tools necessary for safely and correctly installing flooring.

**Lecture + Lab + Other:** 1 + 0 + 0**CTT F133 Cabinet Installation with Countertops**

1 Credit

Offered As Demand Warrants

Provides students with basic concepts of installing cabinets with countertops. Identify various types of cabinet construction (stock/semi-custom/custom-built). Introduction to different types of wood products and special tools. Instruction in and practical application of different techniques of installing base cabinets and top or wall cabinets.

**Lecture + Lab + Other:** 1 + 0 + 0

**CTT F134 Garbage Disposal Installation**

1 Credit

Offered As Demand Warrants

Inform students of the basic knowledge of installing a garbage disposal unit in a basic kitchen cabinet. Students will learn how to use special tools in connecting drain and waste piping and venting systems from a house unit. Students will review safety issues related to the proper handling of plumbing hand and power tools in the installation process.

**Lecture + Lab + Other:** 0.5 + 1 + 0**CTT F135 Boiler Troubleshooting and Burner Repair**

2 Credits

Offered As Demand Warrants

Focuses on the basic components of boilers and burners used in industry for heating residential and commercial properties. Key concepts and strategies related to the process and safety operations of combustion, boiler thermodynamics, control systems, fuel pumps, ignition systems, draft and venting principles and boiler operation according to hydronic principals and Alaska code.

**Lecture + Lab + Other:** 0 + 0 + 0**CTT F136 Landscaping and Horticulture**

2 Credits

Offered As Demand Warrants

Introduces students to the process/procedure of preparing and landscaping a grounded area. Students will be introduced to concepts of placement of appropriate plants and vegetation, maintenance of edged and mowed lawn area, weed and fertilization control and watering schedules.

**Lecture + Lab + Other:** 2 + 0 + 0**CTT F137 Appliance Troubleshooting and Repair**

2 Credits

Offered As Demand Warrants

Provides students with conceptual and practical applications in troubleshooting and repairing appliances. Students will be instructed in diagnostic skills that support repairing and replacing components in various equipment such as refrigerators, washing machines, dishwashers, clothes dryer and oven and cook-tops.

**Lecture + Lab + Other:** 2 + 0 + 0**CTT F138 Residential Heating Controls**

2 Credits

Offered As Demand Warrants

Provides conceptual and practical applications for students wishing to become a residential heating control technician. Topics will explore diagnosis of equipment problems in operation, testing and adjusting conventional and electronic thermostats. Students will also receive instruction on the operation of common electrical and electronic circuits used to control residential heating systems.

**Recommended:** Instructor approval if student has not taken CTT courses.**Lecture + Lab + Other:** 0 + 0 + 0**CTT F141 Door and Window Installation**

1 Credit

Offered As Demand Warrants

Introduces students to door and window installation. Students will learn skills and trade techniques of installation, finish casing and trim. Course will identify Rough Openings (RO) and RO sizing. Introduction to tools necessary for correctly and safely installing doors and windows.

**Lecture + Lab + Other:** 1 + 0 + 0**CTT F150 Plumbing--Level I**

4 Credits

Offered As Demand Warrants

Introduction to basic plumbing techniques, math, hand and power tools, extraction of information from construction drawings and materials used in the plumbing trade. This course is divided into ten (10) modules. Each module must be successfully completed.

**Prerequisites:** CTT F110.**Lecture + Lab + Other:** 3 + 2 + 0**CTT F151 Introduction to Plumbing Tools and Drawings**

1 Credit

Offered As Demand Warrants

Introduction to a plumber's basic hand and power tools, their care and maintenance, and safety procedures. Includes the basics of reading plumbing blueprints and drawings and specific plumbing drawings such as isometric and oblique pictorial drawings, orthographic drawings and schematic drawings.

**Prerequisites:** CTT F110.**Lecture + Lab + Other:** 1 + 0.5 + 0**CTT F153 Plumbing Piping and Tools**

2 Credits

Offered As Demand Warrants

Introduction to basic hand and power tools and various types of piping used in the plumbing industry. Methods of joining various types of pipe and a variety of fittings commonly found in commercial and residential dwellings. Basics of reading plumbing blueprints and drawings, including specific drawings such as isometrics and oblique pictorial.

**Lecture + Lab + Other:** 2 + 0 + 0**CTT F154 Fixtures, Faucets and Venting Systems**

1 Credit

Offered As Demand Warrants

Covers the various types of fixtures plumbers install, including sinks, bathtubs, water closets, garbage disposals, dishwashers and mop basins. An overview of the drain, waste and vent system from inside the building, where the liquid drains into pipes, to the sewer and waste treatment plants.

**Lecture + Lab + Other:** 1 + 0 + 0**CTT F155 Plumbing--Level II**

8 Credits

Offered As Demand Warrants

Introduction to basic plumbing techniques, math, hand and power tools, extraction of information from construction drawings and materials used in the plumbing trade. This course is divided into thirteen modules. Each module must be successfully completed. Generally, each will have two components, a written exam and a hands-on competency test.

**Prerequisites:** CTT F150.**Lecture + Lab + Other:** 4.5 + 7 + 0**CTT F160 Photovoltaic Systems I**

5 Credits

Offered As Demand Warrants

This course is a practical introduction to electric power generation through photovoltaic cells. During this course the student will build a solar panel to understand its operation, installation and maintenance.

**Prerequisites:** CTT F106 and CTT F100.**Lecture + Lab + Other:** 4 + 2 + 0

**CTT F161 Photovoltaic Systems II**

5 Credits

Offered As Demand Warrants

This course covers practical methods of installing photovoltaic systems in residential settings. The students will also learn basic troubleshooting techniques.

**Prerequisites:** CTT F160.**Lecture + Lab + Other:** 4 + 2 + 0**CTT F170 Residential Electrical--Level I**

9 Credits

Offered As Demand Warrants

Introduction to basic electrical techniques, electrical theory, and extraction of information from construction drawings, tools, and materials used in the electrical trades. Course is divided into twelve modules. Each module must be successfully completed.

**Prerequisites:** CTT F115.**Lecture + Lab + Other:** 8 + 2 + 0**CTT F171 Electrical Safety and Electric Theory**

2 Credits

Offered As Demand Warrants

Course covers the safety rules as applied to handling and working with electrical systems and circuits. Includes the required OSHA mandated lockout/tag out procedure, basic electric theory and circuit calculations involving the application of Ohm's and Kirchoff's laws. The student is made aware of precautions to take for various electrical hazards found on the job site.

**Prerequisites:** CTT F115.**Lecture + Lab + Other:** 2 + 0 + 0**CTT F172 Alternating Current, Electrical Test Equipment and the NEC**

2 Credits

Offered As Demand Warrants

Introduction to the principles of alternating current and the operation and applications of various types of electrical test equipment. Includes National Electrical Code.

**Prerequisites:** CTT F171.**Lecture + Lab + Other:** 2 + 0 + 0**CTT F175 Residential Electrical--Level II**

8 Credits

Offered As Demand Warrants

Introduction to basic electrical techniques, electrical theory and extraction of information from construction drawings, tools and materials used in the electrical trades. This course is divided into ten modules. Each module must be successfully completed.

**Prerequisites:** CTT F170.**Lecture + Lab + Other:** 4 + 8 + 0**CTT F199 Student Practicum I**

1-3 Credits

Provides the student the opportunity to practice and develop the skills learned in the classroom. Skills will be developed under the guidance of journeyman and/or qualified personnel on the job site. Course may be repeated twice for a total of three credits.

**Prerequisites:** CTT F115.**Lecture + Lab + Other:** 0 + 2-6 + 0**CTT F240 Introduction to Project Development for Tribal Residential Construction**

3 Credits

Offered As Demand Warrants

This course introduces the roles and responsibilities of project managers who manage and supervise the construction of housing projects in rural Alaska. Because they are funded predominantly by the U.S. Department of Housing and Urban Development (HUD) through the Native American Housing Assistance and Self-Determination Act (NAHASDA), projects conducted by rural housing authorities and tribal organizations have unique planning and administrative requirements. Project managers working in rural Alaska also require specialized training due to complicating factors such as problematic soil conditions, materials availability, transportation and other logistical challenges, and variable workforce capacity. Students will gain skills in developing plans and specifications for rural construction projects, ensure building codes are met during project development, and learn processes and materials unique to isolated locations with limited services.

**Prerequisites:** CIOS F150, CTT F106, Certificate in Construction Trades Technology.**Lecture + Lab + Other:** 3 + 0 + 0**CTT F241 Introduction to Estimating, Cost Control, and Quality Control for Tribal Residential Construction**

3 Credits

Offered As Demand Warrants

This course builds upon the skills obtained in CTT F240 by introducing the roles and responsibilities of project managers relative to project scheduling, estimating, cost control and quality control. Because they are funded predominately by the U.S. Department of Housing and Urban Development (HUD) through the Native American Housing Assistance and Self-Determination Act (NAHASDA), projects conducted by rural housing authorities and tribal organizations have unique planning and administrative requirements. Students will learn to use project scheduling and cost control tools which incorporate these requirements and that have been developed for and proven effective in the management of residential construction projects in rural Alaska. Complicating factors for rural Alaska projects such as materials availability, transportation and other logistical challenges, variable workforce capacity, and complex political environment as they relate to project estimating, cost control and quality assurance will also be discussed.

**Prerequisites:** CTT F240, Certificate in Construction Trades Technology.**Lecture + Lab + Other:** 3 + 0 + 0**CTT F250 Current Topics in Construction Trades**

1-3 Credits

Offered As Demand Warrants

Various topics of current interest in the Construction Trades. Topics announced prior to each semester. Course may be repeated for credit.

**Prerequisites:** CTT F100.**Recommended:** CTT F106.**Lecture + Lab + Other:** 1-3 + 0.5-1.5 + 0**CTT F299 Student Practicum II**

1.5 Credits

Offered As Demand Warrants

Provides the student the opportunity to practice and develop the skills learned in the classroom. Skills will be developed under the guidance of journeyman and/or qualified personnel on the job site.

**Prerequisites:** CTT F155.**Lecture + Lab + Other:** 0 + 3 + 0

**CTT F299P Student Practicum II**

1.5 Credits

Offered As Demand Warrants

Provides the student the opportunity to practice and develop the skills learned in the classroom. Skills will be developed under the guidance of journeyman and/or qualified personnel on the job site.

**Prerequisites:** CTT F155.

**Lecture + Lab + Other:** 0 + 3 + 0