

# CONSTRUCTION TECHNOLOGY (CT)

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## **CT 029 OSHA 10 for Construction (0.0 Units)**

This course provides training for the Construction Industry that teaches construction workers how to identify, abate, avoid, and prevent job-related hazards. Workers also learn about their rights, employer responsibilities, and how to file a complaint. Students will earn an OSHA 10-Hour Construction Safety and Health completion card.

Lecture Hours: 13.5

Transfer: Not transferable

## **CT 030 Low Voltage Electrical Installation I (0.0 Units)**

This course teaches students the fundamentals of low voltage systems installation. Subjects include installation of the following: fire alarms, communications, security, data, video, and building automation systems. This course can lead to employment as a low voltage technician.

Lecture Hours: 13.5; Lab Hours: 54.0

Transfer: Not transferable

## **CT 60A Construction Lab (1-4 Units)**

This is a variable unit (1-4) laboratory class to provide advanced skill development in the following areas: electrical wiring, finish carpentry, heating and air conditioning, framing, plumbing and concrete and masonry construction. Students will complete 48-54 hours per unit of projects over the course of the class.

Lab Hours: 54.0

Transfer: Not transferable

## **CT 60B Construction Lab (1-4 Units)**

A laboratory class to provide additional skill development in the following areas: electrical wiring, finish carpentry, heating and air conditioning, framing, plumbing and concrete and masonry construction. Students will complete contract projects.

Lab Hours: 54.0

Transfer: Not transferable

## **CT 60C Construction Lab (1-4 Units)**

A laboratory class to provide additional skill development in the following areas: electrical wiring, finish carpentry, heating and air conditioning, framing, plumbing and concrete and masonry construction.

Lab Hours: 54.0

Transfer: Not transferable

## **CT 60D Construction Lab (1-4 Units)**

A laboratory class to provide advanced skill development in the following areas: electrical wiring, finish carpentry, heating and air conditioning, framing, plumbing and concrete and masonry construction. CSU

Lab Hours: 54.0

Transfer: Not transferable

## **CT 090A National Electrical Code (0.0 Units)**

This noncredit course will cover the significant changes to the National Electric Code (NEC) as adopted by the State of California. This course is for building inspectors, electricians, and others who must comply with building codes as established by the NEC.

Lecture Hours: 9.0

Transfer: Not transferable

## **CT 90 Introduction to Construction (3.0 Units)**

A foundational Construction course that prepares students for further Construction education and training. Topics include: tool safety and use, construction drawings, math, safety, and basic employability skills. Students who successfully complete CT 90 and CT 91 earn the Multi-Craft Core Curriculum (MC3) Certification for Pre-Apprenticeship, a national construction union certification.

Lecture Hours: 54.0

Transfer: Not transferable

## **CT 91 Introduction to Construction Lab (2.0 Units)**

Lab and skill performance companion to CT 90, prepares students for further Construction education and training. Topics include: tool safety and use, construction drawings, math, safety, and basic employability skills. Students who complete both CT 90 and CT 91 earn the Multi-Craft Core Curriculum (MC3) Pre-Apprenticeship certification.

Co-requisite(s): CT 90

Lab Hours: 108.0

Transfer: Not transferable

## **CT 101 Careers in Construction & Manufacturing (1.5 Units)**

This course is designed to provide the construction and manufacturing technology student with information and skills necessary to understand current job market needs and prepare a successful educational plan to obtain their desired goals. Students will develop an awareness of occupations and develop skills for seeking employment and completing job applications, resumes and interviews. CSU

Lecture Hours: 27.0

Transfer: Transfers to CSU only

## **CT 103 Construction Management (3.0 Units)**

Principles of management as they specifically relate to the construction industry. This course explores the relationship and importance of proper planning, estimating, contracting, financing and building. Also covered are leadership and supervisory skills and employer/employee relationship and safety.

Lecture Hours: 54.0

Transfer: Transfers to CSU only

## **CT 104 Construction Law (3.0 Units)**

Principles of contracting, real estate and construction law. Course includes legal aspects of building codes, contractors licenses, workmen's compensation, social security, state safety regulations and lien laws as they apply to the construction trade.

Lecture Hours: 54.0

Transfer: Transfers to CSU only

## **CT 105 Technical Sketching (3.0 Units)**

A course designed to develop sketching skills and introduce sketching techniques currently used in the construction, industrial and architectural fields. Course will include principals of oblique, isometric and perspective sketching including shading and shadows. CSU

Lecture Hours: 36.0; Lab Hours: 54.0

Transfer: Transfers to CSU only

## **CT 106 Materials of Construction (3.0 Units)**

A study of common materials used in residential and commercial construction. Course includes use and limitations of soil, paving materials, concrete, lumber, wall materials, roofing, insulation, siding, sheet material, electrical and plumbing materials and fixtures. This course will also explore the use of steel, aluminum and plastics in modern construction.

Lecture Hours: 54.0

Transfer: Transfers to CSU only

**CT 107 Technical Mathematics (3.0 Units)**

Review of basic arithmetic, fractions, decimals and percentages. Introduction to basic algebra and trigonometry as they apply to manufacturing and construction trades.

Lecture Hours: 54.0

Transfer: Transfers to CSU only

**CT 109 Construction Financing (3.0 Units)**

This course introduces the basic issues and concepts of construction finance. Course examines the procedures for evaluation of all types of real estate credit and is designed to enable borrowers to utilize their resources to obtain financing.

Lecture Hours: 54.0

Transfer: Transfers to CSU only

**CT 110 Building Codes and Zoning (3.0 Units)**

Use of the International Building Code and the various related state and local ordinances for plan checking and building compliance. Course includes a basic understanding of building codes and zoning as they apply to the construction and inspection of residential and light commercial buildings.

Lecture Hours: 54.0

Transfer: Transfers to CSU only

**CT 111A International Bldg Code I (3.0 Units)**

The first of a two part, in-depth study of the contents and applications of the Uniform Building Code and California amendments with emphasis on residential construction. Course includes building classifications by occupancy and type, engineering regulations and design requirements applicable to plan checking and structural building inspection.

Lecture Hours: 54.0

Transfer: Transfers to CSU only

**CT 111B International Building Code II (3.0 Units)**

An in-depth study of the International Building Code and California amendments with emphasis on commercial applications. Course includes energy conservation standards, specialized commercial structures, public safety and standards for handicapped accessibility. CSU

Lecture Hours: 54.0

Transfer: Transfers to CSU only

**CT 112 Uniform Mechanical Code (3.0 Units)**

This class is an indepth study of the contents and applications of the Uniform Mechanical Code. Course covers the use of this code for plan checks and inspection of residential and commercial structures.

Lecture Hours: 54.0

Transfer: Transfers to CSU only

**CT 113 Uniform Plumbing Code (3.0 Units)**

This course is an indepth study of the contents and applications of the Uniform Plumbing Code. Course includes underground and above ground water, gas and air pipe installations for residential and commercial structures. CSU

Lecture Hours: 54.0

Transfer: Transfers to CSU only

**CT 114 National Electrical Code (3.0 Units)**

This class is an in-depth study of the contents and applications of the National Electrical Code. Course covers the use of the Code for plan checks and inspection of residential and commercial structures. Plan reading, electrical theory, wiring methods and installation of electrical components and fixtures are also included. CSU

Lecture Hours: 54.0

Transfer: Transfers to CSU only

**CT 115 Technical Office Procedures and Field Inspection (3.0 Units)**

Office organization, procedures and necessary paperwork pertinent to building and safety office management and inspection. Field inspection for completed buildings, zoning, health and safety ordinance applications. Course includes several field trips.

Lecture Hours: 54.0

Transfer: Transfers to CSU only

**CT 116 Construction Safety (2.0 Units)**

Covers OSHA policies, procedures, and standards, as well as safety for general industry and health principles. Topics include scope and application of the OSHA general industry standards. Special emphasis is placed on those areas that are the most hazardous, using OSHA standards as a guide. Upon successful course completion, the student will receive either an OSHA 10 or 30 hour general industry or construction industry training completion card. 36 hours lecture.

Lecture Hours: 36.0

Transfer: Transfers to CSU only

**CT 119 Load Calculations/Circuit Design (2.0 Units)**

This course is designed to develop the skills necessary to visualize and correctly interpret drawings, diagrams, blueprints, and schematics common to the electrical industry. Course includes branch and feeder circuit design and load calculations as they apply to residential, multi-family, commercial and industrial applications.

Lecture Hours: 27.0; Lab Hours: 27.0

Transfer: Transfers to CSU only

**CT 120A Electrical Wiring (4.0 Units)**

Theory, procedure and techniques for electrical wiring of residential and light commercial construction. Topic areas include blueprint reading, power panels, wire sizing, conduit bending and installation, pulling and installation of wires, lighting and plug circuitry, designated circuits, underground and swimming pool wiring.

Lecture Hours: 36.0; Lab Hours: 108.0

Transfer: Transfers to CSU only

**CT 120B Commercial Wiring (4.0 Units)**

Learn the techniques necessary for commercial wiring. Size conductors for motor, intermittent and continuous loads. Wire for single and three phase services. Course includes wiring techniques common to commercial applications, running circuits with flex, electrical metallic tubing, rigid and liquid tight conduits and use of common conductors, cables, boxes and raceways. Includes transformer and motor load calculations, starters and over current protection devices.

Prerequisite(s): CT 120A, Minimum grade C

Lecture Hours: 36.0; Lab Hours: 108.0

Transfer: Transfers to CSU only

**CT 121 Finish Carpentry (4.0 Units)**

Course covers use of hand and machine woodworking tools and techniques common to finish carpentry and cabinet making. Students will develop skill in safe and efficient operation of common tools, layout, cutting, assembly and finish of woodworking projects.

Lecture Hours: 36.0; Lab Hours: 108.0

Transfer: Transfers to CSU only

**CT 122A Heat and Air Conditioning (4.0 Units)**

This course provides instruction for layout, installation and repair of common residential and light commercial heating and air conditioning systems. Heating and air conditioning theory and energy calculations will be treated in detail. Course also includes use of solar energy for heating and cooling.

Lecture Hours: 36.0; Lab Hours: 108.0

Transfer: Transfers to CSU only

**CT 122B Commercial Refrigeration (4.0 Units)**

Explore the more complex commercial and industrial uses of refrigeration, heating and air conditioning. Course covers installation and repair of the most common commercial refrigeration systems found in the food industry and industrial and manufacturing environments. Also included are computer controlled and central plant environmental systems, high and low pressure chillers, cooling towers and air handlers. Prerequisite(s): CT 122A, Minimum grade C  
Lecture Hours: 36.0; Lab Hours: 108.0  
Transfer: Transfers to CSU only

**CT 122C Heat Pump Fundamentals/Controls (4.0 Units)**

This course explores electrical and mechanical circuitry fundamentals, along with theory, operation and application of heat pump systems used in residential and light commercial heating installations including the heat pump refrigeration cycle, reversing valves, defrost methods of supplemental heat, balance point, air flow, and heat pump thermostats. Lecture Hours: 54.0; Lab Hours: 54.0  
Transfer: Transfers to CSU only

**CT 123 Surveying (4.0 Units)**

A course designed to explore the principles and applications of surveying. Students will develop skill in the operation of surveying equipment used for measuring, leveling and locating of points. Course includes surveying techniques common to building and highway construction, general land surveying, hydrographic surveys and photogrammetric mapping. Lecture Hours: 36.0; Lab Hours: 108.0  
Transfer: Transfers to CSU only

**CT 124 Plumbing (4.0 Units)**

This course provides instruction for layout and installation of residential and light commercial plumbing systems and fixtures. Rough and finish stages of plumbing will be introduced and students will become familiar with reading plans and calculating and constructing the plumbing system. Lecture Hours: 36.0; Lab Hours: 108.0  
Transfer: Transfers to CSU only

**CT 125 Concrete/Masonry (4.0 Units)**

Course covers use of hand and machine tools and techniques common to residential and light commercial concrete and masonry construction. Plan reading, layout, forming, pouring of concrete, tilt-up and various finishing techniques will be introduced. Course also includes construction with brick, stone, concrete block, and other masonry shapes. CSU Lecture Hours: 36.0; Lab Hours: 108.0  
Transfer: Transfers to CSU only

**CT 126 Exploring Brick and Block (1.5 Units)**

Grade Option. This course includes techniques used for construction of brick and block walls, decorative brick patios, planter edging and concrete slabs, curbs and walks. Class covers information on concrete and mortar mixes and proper forming, pouring and finishing of concrete slab wall footings. Lecture Hours: 18.0; Lab Hours: 27.0  
Transfer: Transfers to CSU only

**CT 127 Framing (4.0 Units)**

Course covers use of hand and machine tools and techniques common to rough carpentry and residential and light commercial framing. Students will develop skill in safe and efficient operation of common tools, layout techniques, cutting and assembly of wall, ceiling and roof framing, and installing sheathing and insulation. CSU Lecture Hours: 36.0; Lab Hours: 108.0  
Transfer: Transfers to CSU only

**CT 130 Residential Remodeling (3.0 Units)**

Grade Option. Learn the skills and techniques necessary for remodeling of structures. Course includes project planning, estimation and layout. Gain experience in framing, plumbing, electrical, dry wall, floor and wall finishing and concrete with projects that include patio and deck construction, room additions and kitchen and bathroom remodeling. Lecture Hours: 36.0; Lab Hours: 54.0  
Transfer: Transfers to CSU only

**CT 131 Computer Applications for Technology (4.0 Units)**

This course is designed to introduce the student to the potentials of the computer as it directly applies to the construction industry. Course includes instruction and practice in the following common program types: operating system, word processing, presentation, spreadsheet, e-mail, web-page design, publishing, estimation, and introductory computer aided drafting. Lecture Hours: 54.0; Lab Hours: 54.0  
Transfer: Transfers to CSU only

**CT 132 Construction Estimation (3.0 Units)**

Learn how to bid accurately and profitably. Course will teach you how to account for materials, labor, taxes, insurance, overhead, and profits across various trades in preparing winning estimates. Speed up your estimating process and increase your accuracy using today's leading construction estimation software. Estimating software allows take-offs using quick, single and assembly methods to meet your particular estimating needs. Lecture Hours: 54.0  
Transfer: Transfers to CSU only

**CT 133 Precision Estimation (3.0 Units)**

Learn how to speed up your estimating process and increase your accuracy using today's leading construction estimation software. Estimating software allows take-off using quick, single and assembly methods. Course includes development and maintenance of your database. Create your own crews, add-ons, formulas and assemblies to meet your particular estimating needs. Lecture Hours: 36.0  
Transfer: Transfers to CSU only

**CT 136 HVAC Circuits and Controls (4.0 Units)**

This course explores electrical fundamentals common to the heating, ventilation, air conditioning and refrigeration fields. Course includes electrical theory, control circuitry and electronics, system supply circuitry and alternating and direct current troubleshooting. CSU Lecture Hours: 54.0; Lab Hours: 54.0  
Transfer: Transfers to CSU only

**CT 138 Work Experience Education Construction Technology (1-8 Units)**

Work Experience Education is a key element of Victor Valley College's comprehensive approach to career development. Work Experience Education is a 16-, 12-, or 8-week course that enables students to receive college credit for paid or unpaid work opportunities. This course helps students gain valuable on-the-job work experience while providing practical education, best practices in professional development, and academic guidance through the course of their work opportunity. The combination of practical experience and curricular development empowers students to be more competitive, efficient and valuable employees upon completion of this program and/or their academic program trajectory. The course is ideal for students who are cross-training at their current worksite for upward mobility or seeking career changes, as well as those looking for entry-level occupational training through work-based learning experiences such as through an internship. Work Experience Education transforms community businesses, industries, and public agencies into expanded educational training laboratories. Credit is awarded on the basis of learning objectives completed and the number of hours the student trains. Students must create/complete new learning objectives each semester they enroll. Students may utilize their present work sites. More details are available in the Work Experience Education Office, (760) 245-4271, ext. 2281. The office, located in the Academic Commons, is open Monday-Thursday, 8:00 a.m.-1:00 p.m., 2:00-6:00 p.m., and by appointment. Please refer to the Work Experience Education section in this catalog for more information.

CSU  
Transfer: Transfers to CSU only

**CT 142 Renewable Energy Fundamentals (3.0 Units)**

This course explores methods of generation and use of renewable energy. Topics include renewable fuel based generators, fuel cells, wave and tidal generation, geothermal, wind turbines, photovoltaic, barometric pressure, and hydroelectric generation. Course also covers active and passive solar heating and cooling, alternate fueled vehicles and electric transportation.

Lecture Hours: 54.0

Transfer: Transfers to CSU only

**CT 143A Renewable Energy Laboratory A: Photovoltaic (2.0 Units)**

This course explores using photovoltaic technology to generate electricity for various applications: residential, remote, portable, auxiliary, or mobile.

Co-requisite(s): CT 142

Lecture Hours: 18.0; Lab Hours: 54.0

Transfer: Transfers to CSU only

**CT 143B Renewable Energy Lab B: Solar Thermal (2.0 Units)**

This course explores using solar thermal technology for various applications including passive/active heating/cooling and generating electricity. CSU

Co-requisite(s): CT 142

Lecture Hours: 18.0; Lab Hours: 54.0

Transfer: Transfers to CSU only

**CT 143C Renewable Energy Laboratory C: Wind (2.0 Units)**

This course explores renewable energy with a focus on wind electrical generation through the completion of actual projects.

Co-requisite(s): CT 142

Lecture Hours: 18.0; Lab Hours: 54.0

Transfer: Transfers to CSU only

**CT 143D Renewable Energy Lab D: Alternative Fuels (2.0 Units)**

This course explores using alternative fuels for transportation, heating systems, and generating electricity through the construction of an actual project.

Co-requisite(s): CT 142

Lecture Hours: 18.0; Lab Hours: 54.0

Transfer: Transfers to CSU only

**CT 144 Photovoltaic Systems and Installation (6.0 Units)**

Residential Solar Industry preparation: PV system components/function, building codes, sizing/design, and solar principles. Lab: design, safely install, and trouble-shoot multiple systems.

Lecture Hours: 72.0; Lab Hours: 108.0

Transfer: Transfers to CSU only

**CT 148 Special Topics And Installation (6.0 Units)**

A foundational construction course that prepares students for further construction education and training. Topics include: tool safety and use, construction drawings, math, safety, and basic employability skills. Students who complete the course can test to be certified in the Core Curriculum of the National Center for Construction Education and Research, a national construction certification. CSU

Lecture Hours: 54.0; Lab Hours: 108.0

Transfer: Transfers to CSU only