

# CONSTRUCTION AND ENERGY TECHNOLOGY (CET)

## CET 0001. OSHA Construction Safety Training

*Unit: 1*

Hours: 18 lecture

Covers a variety of construction safety and health hazards workers may encounter. Provides safety information to construction workers about employee and employer rights and responsibilities. Emphasizes identification, avoidance, abatement, control, and prevention of job-related hazards on construction sites. Upon successful completion, 10 hour OSHA card issued by instructor. (not transferable)

## CET 0003. Introduction to Construction and CNC Woodworking

*Units: 3*

Formerly known as: CTC 1 or CTR 1

Advisory: Completion with grade of "C" or better or concurrent enrollment in CET 1

Hours: 108 (36 lecture, 72 laboratory)

Designed to teach the skills required to be successful in the construction and woodworking industries. Topics include fundamentals of woodworking, safe operation of hand tools, introduction to wood CNC manufacturing, project drawings, and environmentally sound design and construction techniques. Hands-on experience with construction and woodworking tools and materials based on assigned student project(s). (not transferable)

## CET 0005. Introduction to the Built Environment

*Units: 3*

Formerly known as CTR 45

Hours: 54 lecture

Introduction to the building industry: trends, organizations, construction processes, contracting laws, regulations, business aspects and career pathways. (CSU)

## CET 0007. Building with Green Construction Materials

*Units: 4*

Advisory: Completion with grade of "C" or better or concurrent enrollment in CET 1

Hours: 180 (18 lecture, 162 laboratory)

Project-based study of the performance characteristics of building materials using sustainable construction techniques and materials. Includes the basic properties and installation techniques of metals, aggregates, cement products, asphalt products and wood. Safe handling of construction materials and tools. (CSU)

## CET 0020. Foundations and Framing

*Units: 3*

Formerly known as CTR 42

Hours: 108 (36 lecture, 72 laboratory)

Fundamentals of residential foundation and floor system techniques involving layout and construction to include: establishing elevations, site preparation, types of foundation forms, rebar and bolt installation, concrete placement techniques, various types of floor systems, and code requirements specific to the above. Major lab project: construction of a foundation and floor system. Includes use and practices of materials and codes related to California Green Technology and "Net Zero Energy" policies. (CSU)

## CET 0022. Introduction to Energy Efficiency Construction

*Units: 3*

Formerly known as CTR 44

Hours: 108 (36 lecture, 72 laboratory)

Fundamentals of residential framing both conventional and green energy efficient techniques involving layout and construction to include: exterior and interior walls, ceilings, roof systems, stair designs and installation. Major lab project: framing a project in the community. Includes use and practices of materials and codes related to California Green Technology and "Net Zero Energy" policies. (CSU)

## CET 0024. Fundamentals of Construction Documents and Estimating

*Units: 3*

Formerly known as CTR 47 and 48

Hours: 54 lecture

Establishes a vocabulary and understanding of construction related documents including the symbols and detail views of building plans. Cost estimating to include material and labor cost calculations, specifications, problem solving, and bid preparations. (CSU)

## CET 0026. Residential House Wiring and Codes

*Units: 3*

Formerly known as CTR 60

Hours: 108 (36 lecture, 72 laboratory)

Instruction basic to the electrical wiring trade. Inside wiring as applied to residential structures. Electrical service requirements for photovoltaic systems. Use of tools and materials of the trade. Review of the National Electrical Code and the applications and CEC updates due to California Green Technology and "Net Zero Energy" policies. (CSU)

## CET 0028. Independent Study

*Units: 1-3*

Formerly known as CTR 28

Designed for students interested in furthering their knowledge at an independent study level in an area where no specific curriculum offering is currently available. Independent study might include, but is not limited to, research papers, special subject area projects, and research projects. See Independent Study page in catalog. (CSU)

## CET 0030. Finish Carpentry

*Units: 3*

Formerly known as CTR 41

Advisory: Completion with grade of "C" or better or concurrent enrollment in CET 3

Hours: 108 (36 lecture, 72 laboratory)

Fundamentals of woodworking hand tools, power hand tools and woodworking machinery to safely develop knowledge and skills leading to finish trim carpentry. Emphasis on residential construction finish carpentry standards, details, nomenclature, trims, and methods of setting interior and exterior doors, window jamb and trims, closet packs, cabinet installs, wainscoting, stair trim and railings, base and ceiling trims and finished flooring applications. (not transferable)

## CET 0032. Residential Building Codes

*Units: 3*

Formerly known as CTR 52

Hours: 54 lecture

Instruction in building codes for light frame one- or two-story dwellings related to local jurisdictions and the State of California. Application of codes to existing buildings with a study of regulations and abatement procedures for standard frame and ICF green technology buildings. Includes codes related to California Green Technology and "Net Zero Energy" policies. (not transferable)

**CET 0034. Plumbing Installation and Design**

*Units: 3*

Formerly known as CTR 62

Hours: 108 (36 lecture, 72 laboratory)

Planning, installing, and maintaining simple waste, water and gas plumbing systems in accordance with good practice and in conformity to local codes and ordinances. Overview of new plumbing techniques. Includes use of materials and codes related to California Green Technology and "Net Zero Energy" policies. (CSU)

**CET 0040. Beginning Photovoltaic Systems**

*Units: 4*

Formerly known as ESS 30

Advisory: Completion with grade of "C" or better or concurrent enrollment in CET 1

Hours: 108 (54 lecture, 54 laboratory)

Introduction to photovoltaic concepts, applications, and the solar energy industry. Includes basics of electricity, load estimation, energy efficiency, solar site assessment, photovoltaic system components, sizing, financial analysis, design, installation concepts, and maintenance. This course taken with CET 42 prepares students to sit for the NABCEP PV Entry Level Certificate of Knowledge exam. (CSU)

**CET 0042. Intermediate Photovoltaic Systems**

*Units: 4*

Formerly known as ESS 32

Prerequisite: Completion of CET 40 with grade of "C" or better

Hours: 108 (54 lecture, 54 laboratory)

Expands on the fundamentals of photovoltaics with a focus on system design and installation concepts of grid-connected residential and small commercial systems. Topics include detailed system sizing, array layout, mounting on various roof constructions, mechanical and electrical integration as well as related electrical codes and workplace safety standards. This course, taken with CET 40, prepares students to sit for the NABCEP PV Entry Level Certificate of Knowledge exam. (CSU)

**CET 0044. Advanced Photovoltaic Systems**

*Units: 4*

Formerly known as ESS 34

Prerequisite: Completion of CET 42 with grade of "C" or better

Hours: 108 (54 lecture, 54 laboratory)

Examines the theoretical and technical dimensions of photovoltaic (PV) systems in detail. Topics include advanced principles of electricity and how they apply to PV systems, commissioning, troubleshooting, net metering laws, local codes, and National Electric Code PV requirements. Off campus activities required. (CSU)

**CET 0046. Solar Photovoltaic Sales**

*Units: 3*

Advisory: Completion with grade of "C" or better or concurrent enrollment in CET 40

Hours: 54 lecture

Introduction to photovoltaic sales concepts and the solar energy industry. Includes basics of photovoltaic marketing, sales, incentives, site usage, site assessment, photovoltaic system components, system sizing, financial analysis, and sales communication techniques. (not transferable)

**CET 0047. Introduction to Energy Surveying**

*Units: 4*

Hours: 108 (54 lecture, 54 laboratory)

Competency-based course of instruction designed to align with the American Society of Heating Refrigeration and Air Conditioning Engineers (ASHRAE) Level-1 energy auditing standards. Provides students with hands-on experience in residential and commercial energy auditing. Emphasis on principles and sources of energy, detailed facilities evaluation techniques, data collection for energy auditing, establishing baselines, and conducting accurate inventories. Includes workplace safety policies and practices to comply with OSHA guidelines. (not transferable)

**CET 0050. Interior and Exterior Finishing**

*Units: 3*

Formerly known as CTC 24 or CTR 24

Hours: 108 (36 lecture, 72 laboratory)

Focus on removal and preparation of existing and new finishes, sanding, masking, caulking, applications of stains, shellac, varnishes and lacquers, interior and exterior painting with primers and paint, use of brushes, rollers and spray systems, HVLP and airless. (not transferable)

**CET 0060. Production Cabinetry (Traditional)**

*Units: 3*

Formerly known as CTC 5 or CTR 5

Advisory: Completion with grade of "C" or better or concurrent enrollment in CET 3

Hours: 108 (36 lecture, 72 laboratory)

Economy and custom grade conventional case construction revolving around industrial standards, joinery, processes, structures and hardware of residential case structural systems. Also includes computer-aided spatial designs. Lab work shall be instructor-initiated case structures for a residential project. (not transferable)

**CET 0070A. Advanced Skill and Speed Development - Concrete**

*Units: 3*

Formerly known as CTR 37A

Prerequisite: Completion with grade of "C" or better or concurrent enrollment in CET 20

Hours: 108 (36 lecture, 72 laboratory)

Designed to provide an advanced level of skill, speed, and experience for concrete students. Continued in-depth study of materials acquisition, scheduling, detailed layouts, forming for foundations or other applications using concrete as a base. Uses extensive problem solving in the completion of a department selected project. (not transferable)

**CET 0070B. Advanced Skill and Speed Development - Framing**

*Units: 3*

Formerly known as CTR 37B

Prerequisite: Completion with grade of "C" or better or concurrent enrollment in CET 0020 or 0022

Hours: 108 (36 lecture, 72 laboratory)

Designed to provide an advanced level of skill, speed, and experience for framing students. Continued in-depth study of materials acquisition, scheduling, detailed layouts for framing structures, to include floors, walls, rooms, and roofs. Uses extensive problem solving in the completion of a department-selected project. (not transferable)

**CET 0070C. Skill and Speed Development-Cabinetry and Furniture**

Units: 3

Formerly known as CTC 35 or CTR 38

Prerequisite: Completion with grade of "C" or better or concurrent enrollment in CET 3

Advisory: Completion of CET 60 with grade of "C" or better

Hours: 108 (36 lecture, 72 laboratory)

Designed to further develop skill, speed, and experience capabilities to advance knowledge in construction technology. In-depth study of architectural woodwork standards; extensive problem solving in student-selected laboratory projects. (not transferable)

**CET 0095. Internship in Construction and Energy Technology**

Units: 0.5-4

Formerly known as CTR 95

Designed for advanced students to work in an area related to their educational or occupational goal. Provides new on-the-job technical training under the direction of a worksite supervisor, allowing students to expand knowledge and skills in the chosen field. Mandatory orientation session and faculty approval to determine eligibility. Students may earn up to a total of 16 units in internship courses (any course numbered 95 and PDEV 94). (CSU-with unit limitation)

**CET 0800. Introduction to Energy Surveying**

Units: 0

Prerequisite: Completion of CET 1 with grade of "C" or better, or equivalent as determined by the program chair

Hours: 40 (24 lecture, 16 laboratory)

Competency-based course of instruction designed to align with the American Society of Heating Refrigeration and Air Conditioning Engineers (ASHRAE) Level-1 energy auditing standards. Provides hands-on experience in residential and commercial energy auditing. Emphasis on principles and sources of energy, detailed facilities evaluation techniques, data collection for energy auditing, establishing baselines, and conducting accurate inventories. Includes workplace safety policies and practices to comply with OSHA guidelines. Students required to secure personal protective equipment as of first class session. (pass/no pass grading) (noncredit)

**CET 0801. Basic Electricity and Wiring Fundamentals**

Units: 0

Prerequisite: Completion of CET 800 with grade of "Pass"

Hours: 40 (20 lecture, 20 laboratory)

This comprehensive introduction to electrical wiring provides a well-rounded understanding of the fundamentals of basic electricity, electrical safety, electrical circuitry, and the processes and procedures of the electrical wiring trades. Includes relevant electrical codes. Students required to secure personal protective equipment as of first class session. (pass/no pass grading) (noncredit)

**CET 0802. Introduction to Lighting Retrofits**

Units: 0

Prerequisite: Completion of CET 801 with grade of "Pass"

Hours: 40 (20 lecture, 20 laboratory)

Provides well-rounded competency-based understanding of lighting retrofit trade fundamentals through hands-on experience in commercial retrofit procedures and skills. Includes electrical safety, policies, and practices as relate to retrofit work. Students required to secure personal protective equipment as of first class session. (pass/no pass grading) (noncredit)

**CET 0804. Rapid Prototyping for Product Design**

Units: 0

Hours: 18 (9 lecture, 9 laboratory)

Hands-on exposure to processes used to fabricate prototypes. An introduction to tools and technologies for prototyping, including design for manufacture. Example products show the process from idea to market including the series of prototypes that helped get the product to successful sales. Course materials cover safe hand tool use, power woodworking hand tools, wood shop tools, laser cutting, and CNC routers. (pass/no pass grading) (noncredit)

**CET 0805. Introduction to Industry and Occupational Safety for the Building Trade**

Units: 0

Hours: 28 (24 lecture, 4 laboratory)

Provides an introduction to the building trades as an occupation. Covers a variety of construction safety and health hazards workers may encounter. Provides safety information to construction workers about employee and employer rights and responsibilities. Emphasizes identification, avoidance, abatement, control, and prevention of job-related hazards on construction sites. Upon successful completion, 10 hour OSHA card issued by instructor. (pass/no pass grading) (noncredit)

**CET 0806. Introduction to Building Trades and Tools**

Units: 0

Prerequisite: Completion of CET 805 with grade of "Pass"

Hours: 48 (27 lecture, 21 laboratory)

Provides an overview of the local/regional building trade industry. Introduces students to the proper and safe operation of hand and power tools used in construction. Covers the fundamentals of construction math, measurements and blueprints. Emphasizes the employability skills such as time management, communication and proper attire for success in the construction industry. (pass/no pass grading) (noncredit)

**CET 0807. Basic Material Handling and Building**

Units: 0

Prerequisite: Completion of CET 806 with grade of "Pass"

Hours: 53 (36 lecture, 17 laboratory)

Provides an overview of building materials and techniques for construction. Introduces students to basic trades including plumbing, electrical and HVAC. Covers the fundamentals of framing, flooring and tiling. Explains related building codes. (pass/no pass grading) (noncredit)