

# CONSTRUCTION TECHNOLOGY (CNSTR)

## **CNSTR 098 Directed Study in Construction 0.5-9 Units**

Individual or small groups of students who would benefit from Independent Study under the direction of faculty members in specific or related disciplines may develop individualized learning contracts designed to enhance their individual instructional programs. The students and the faculty member in consultation with the Division Dean will determine appropriate learning objectives and activities as well as the number of units to be earned. Instructions and the Learning Contract forms are available in the Division office. Repeatable to a maximum of 9 units across all disciplines.

Lecture Hours: None Lab Hours: 2.07 Repeatable: Yes Grading: O  
Advisory Level: Read: 2 Write: 2 Math: None  
Transfer Status: CSU Degree Applicable: AA/AS  
For General Education (GE) information, please refer to assist.org (<https://assist.org>) or consult a counselor.

## **CNSTR 101A Tools, Materials, and Safety 2 Units**

Students will learn to properly use a variety of hand and power tools that are commonly utilized in constructing and repairing houses. Students will also learn about materials used in the construction industry including dimensional and engineered lumber, manufactured and energy efficient building materials, and fasteners and adhesives. These tools and materials will be incorporate Building Information Modeling (BIM) and be used to build projects in the shop. Students also learn how to choose the best tool for the job at hand and to use that tool efficiently and safely. This entry-level course to the construction industry is a prerequisite for several of the other Construction Technology courses. Students will utilize Building Information Modeling (BIM) as part of this course.

Lecture Hours: 1 Lab Hours: 3 Repeatable: No Grading: L  
Recommended: Ability to accurately measure and do calculations using feet, inches, and fractions  
Advisory Level: Read: 3 Write: 3 Math: None  
Transfer Status: CSU Degree Applicable: AA/AS  
For General Education (GE) information, please refer to assist.org (<https://assist.org>) or consult a counselor.

Credit by Exam: Yes

## **CNSTR 101B Residential Construction Framing 3 Units**

Students are introduced to the requirements and techniques of properly framing residential structures per the Residential Code and interact and construct a design from students taking Building Information Modeling (BIM) course. Students will layout, frame floors and ceilings, and plumb and line walls. Students will also acquire skills in laying subfloor, hanging shear wall and installing metal fasteners. Students will learn to read simple floor plans and identify foundation types and parts. Students will utilize Building Information Modeling (BIM) as part of this course.

Lecture Hours: 2 Lab Hours: 3 Repeatable: No Grading: L  
Corequisite: CNSTR 101A  
Transfer Status: CSU Degree Applicable: AA/AS  
For General Education (GE) information, please refer to assist.org (<https://assist.org>) or consult a counselor.

Credit by Exam: Yes

## **CNSTR 102A Residential Plumbing Systems 3 Units**

Students will be introduced to the concepts of residential plumbing systems and energy efficient technology. The course covers the theory and practice of plumbing for residential dwellings. Students will study topics including, but not limited to, drain, waste and vent design and installation, domestic water piping systems design and installation, and plumbing fixture installation and repair.

Lecture Hours: 2 Lab Hours: 3 Repeatable: No Grading: L  
Corequisite: CNSTR 101A  
Advisory Level: Read: 3 Write: 3 Math: 1  
Transfer Status: CSU Degree Applicable: AA/AS  
For General Education (GE) information, please refer to assist.org (<https://assist.org>) or consult a counselor.

Credit by Exam: Yes

## **CNSTR 102B Residential/Commercial Wiring 3 Units**

Students will study the fundamentals of residential and commercial electrical wiring including electrical theory, installation of receptacles, switches, GFCIs (Ground Fault Circuit Interrupters), AFCIs (Arc Fault Circuit Interrupters), lighting devices and service panels. Students will develop a working knowledge of circuits, sizing conductors, box fill, load calculations, wiring diagrams, grounding requirements, circuit breakers and pipe bending. Electrical codes, symbols, energy saving technology, tools of the trade and safety will also be covered. This course meets the state requirement for entry level electricians to get their trainee card. Students will utilize Building Information Modeling (BIM) as part of this course.

Lecture Hours: 2 Lab Hours: 3 Repeatable: No Grading: L  
Recommended: General math skills are needed for calculations  
Advisory Level: Read: 3 Write: 3 Math: 1  
Transfer Status: CSU Degree Applicable: AA/AS  
For General Education (GE) information, please refer to assist.org (<https://assist.org>) or consult a counselor.

## **CNSTR 103 Roof Framing Systems 3 Units**

Students will be introduced to the theory and practice of roof framing for residential dwellings. Topics covered include erecting trusses, rafter length calculations for common, hip, valley and jack rafters, ridge board lengths, techniques for cutting, installing, bracing, sheathing and fascia for rafters. Install of trusses will also be included. Students will utilize Building Information Modeling (BIM) as part of this course.

Lecture Hours: 2 Lab Hours: 3 Repeatable: No Grading: L  
Corequisite: CNSTR 101A  
Advisory Level: Read: 3 Write: 3 Math: 1  
Transfer Status: CSU Degree Applicable: AA/AS  
For General Education (GE) information, please refer to assist.org (<https://assist.org>) or consult a counselor.

Credit by Exam: Yes

**CNSTR 104 Interior/Exterior Finish 3 Units**

Students study methods for finishing interior and exterior walls, floors and ceilings. Topics include interior and exterior wall coverings, insulation, door and window installations, and common construction defects as well as identify composite materials and applications. Students will utilize Building Information Modeling (BIM) as part of this course.

Lecture Hours: 2 Lab Hours: 3 Repeatable: No Grading: L  
Corequisite: CNSTR 101A  
Advisory Level: Read: 3 Write: 3 Math: 1  
Transfer Status: CSU Degree Applicable: AA/AS  
For General Education (GE) information, please refer to assist.org (<https://assist.org>) or consult a counselor.

Credit by Exam: Yes

**CNSTR 105 Concrete Construction 3 Units**

Students will be introduced to concepts associated with concrete and many applications of concrete in residential and commercial construction. Industry standards set by the American Concrete Institute and the American Society of Testing and Materials are presented. Students use transit and levels, set hubs and batter boards, construct concrete forms, bend reinforcing steel, and correctly mix, place, and finish concrete. Exposed aggregate, colored and stamped surface textures will be taught. Students will also study admixtures, curing methods, energy efficient and air entrained concrete, testing procedures, stair formwork, retaining walls, read blueprints and complete concrete materials estimates. Students will utilize Building Information Modeling (BIM) as part of this course.

Lecture Hours: 2 Lab Hours: 3 Repeatable: No Grading: L  
Corequisite: CNSTR 101A  
Advisory Level: Read: 3 Write: 3 Math: 1  
Transfer Status: CSU Degree Applicable: AA/AS  
For General Education (GE) information, please refer to assist.org (<https://assist.org>) or consult a counselor.

Credit by Exam: Yes

**CNSTR 107 Principles of Contracting 3 Units**

Students will be introduced to the requirements and regulations necessary to start and run a successful construction company including common industry standards and preferred practices. Topics include: licensing requirements (all classifications), federal, state, local and environmental regulations, insurance and contract obligations, business plans, marketing, accounting, computerized tracking of the above items, business forms, tax and payroll requirements, change orders, mechanics lien law, scheduling, working with sub contractors, business ethics and personnel hiring. Students will utilize Building Information Modeling (BIM) as part of this course.

Lecture Hours: 3 Lab Hours: None Repeatable: No Grading: L  
Advisory Level: Read: 3 Write: 3 Math: 1  
Transfer Status: CSU Degree Applicable: AA/AS  
For General Education (GE) information, please refer to assist.org (<https://assist.org>) or consult a counselor.

**CNSTR 110 Building Information Modeling (BIM) 101 3 Units**

Students will prepare working drawings utilizing the Building Information Modeling (BIM) program from which building structures will be designed. Students will participate in BIM to collaborate with other students and disciplines within the Construction Department in designing their projects to include designing, planning room areas, elevations, construction, and estimating building cost.

Lecture Hours: 2 Lab Hours: 3 Repeatable: No Grading: L  
Recommended: Completion of CNSTR 106  
Advisory Level: Read: 3 Write: 3 Math: 1  
Transfer Status: CSU Degree Applicable: AA/AS  
For General Education (GE) information, please refer to assist.org (<https://assist.org>) or consult a counselor.

Credit by Exam: Yes

**CNSTR 115 Blueprint Reading 3 Units**

Students will be introduced to reading and interpreting residential and light commercial construction drawings and specifications. Topics include energy efficient and traditional materials, symbols, and abbreviations. Students will learn to interpret plot plans, floor and roof plans, elevations, details, and sectional views including the alphabet of lines. This is a print reading, not a drafting course, although sketching techniques are taught. Use of the architect's scale is taught. Students will utilize Building Information Modeling (BIM) as part of this course.

Lecture Hours: 3 Lab Hours: None Repeatable: No Grading: L  
Advisory Level: Read: 3 Write: 3 Math: None  
Transfer Status: CSU Degree Applicable: AA/AS  
For General Education (GE) information, please refer to assist.org (<https://assist.org>) or consult a counselor.

Credit by Exam: Yes

**CNSTR 116 Estimating 3 Units**

Students will be introduced to the basic concepts of construction cost estimating and how to estimate the quantity of labor and materials needed, as well as overhead, management and profit, and to determine the cost of a construction project. Students will work from actual plans to calculate the cost of trade and subcontract work, transportation, insurance, and permits for residential and commercial projects. Students will also become familiar with estimating energy efficient construction materials and specifications. Students will utilize Building Information Modeling (BIM) as part of this course.

Lecture Hours: 3 Lab Hours: None Repeatable: No Grading: L  
Advisory Level: Read: 3 Write: 3 Math: None  
Transfer Status: CSU Degree Applicable: AA/AS  
For General Education (GE) information, please refer to assist.org (<https://assist.org>) or consult a counselor.

Credit by Exam: Yes

**CNSTR 117 OSHA Construction Safety Standards 1 Unit**

Students will receive outreach training which concentrates on OSHA safety for entry level construction workers. Students will be taught to recognize and prevent hazards which a worker may encounter at a construction site. Students will be issued an OSHA 10 card upon successful completion of the class. Students will utilize Building Information Modeling (BIM) as part of this course.

Lecture Hours: 1 Lab Hours: None Repeatable: No Grading: L  
Advisory Level: Read: 3 Write: 3 Math: None  
Transfer Status: CSU Degree Applicable: AA/AS  
For General Education (GE) information, please refer to assist.org (<https://assist.org>) or consult a counselor.

Credit by Exam: Yes

**CNSTR 118 Project Management for Construction 3 Units**

Students will be introduced to project management. Students will assess and solve a variety of construction-related problems while working from Building Information Modeling (BIM) drawings created by students. Topics will include scope of projects, safety, estimating, scheduling, cost control, and construction law.

Lecture Hours: 3 Lab Hours: None Repeatable: No Grading: L  
Advisory Level: Read: 3 Write: 3 Math: 1  
Transfer Status: CSU Degree Applicable: AA/AS  
For General Education (GE) information, please refer to assist.org (<https://assist.org>) or consult a counselor.

Credit by Exam: Yes

**CNSTR 120 Building Codes 3 Units**

Students will be introduced to the California Residential Code (CRC), which is based on the first ten chapters of the International Residential Code (IRC). Topics include interpreting and applying code regulations, requirements for obtaining building permits and the inspection process, and working cooperatively with building inspectors. Students will utilize Building Information Modeling (BIM) as part of this course.

Lecture Hours: 3 Lab Hours: None Repeatable: No Grading: L  
Advisory Level: Read: 3 Write: 3 Math: None  
Transfer Status: CSU Degree Applicable: AA/AS  
For General Education (GE) information, please refer to assist.org (<https://assist.org>) or consult a counselor.

**CNSTR 125 Energy Efficiency Construction 3 Units**

Students are introduced to the rapidly evolving field of sustainable construction, including healthy indoor environments, selection of green materials, and conservation of resources. Students study energy efficient construction, solar hot water, photovoltaic and radiant heat, improved insulation, lighting strategies, ERV (energy recovery ventilators) and HRV (heat recovery ventilators), deconstruction, optimum value engineering, SIPS (structurally insulated panel systems), ICF (insulated concrete forms), rammed earth, adobe, straw bale, green roofs, and earthcrete. Field trips are required.

Lecture Hours: 3 Lab Hours: None Repeatable: No Grading: L  
Advisory Level: Read: 3 Write: 3 Math: 1  
Transfer Status: CSU Degree Applicable: AA/AS  
For General Education (GE) information, please refer to assist.org (<https://assist.org>) or consult a counselor.

**CNSTR 128 National Electrical Code & Calculations 3 Units**

Students will be introduced to the requirements of the National Electrical Code (NEC) and standards. Students will be able to recognize electrical code violations that are associated with residential and commercial installations. Students will learn how to do the calculations for load, conduit and box fill, as well as conductor, transformer, and residential service sizing. This course meets the state requirement for entry level electricians to obtain their trainee card. The course also prepares students for the state journeyman certification exam and other field related exams. Students will utilize Building Information Modeling (BIM) as part of this course.

Lecture Hours: 3 Lab Hours: None Repeatable: No Grading: L  
Recommended: CNSTR 102B and/or other related trade knowledge  
Advisory Level: Read: 3 Write: 3 Math: 1  
Transfer Status: CSU Degree Applicable: AA/AS  
For General Education (GE) information, please refer to assist.org (<https://assist.org>) or consult a counselor.

**CNSTR 138 Work Experience 1-8 Units**

Construction Work Experience is designed for students who work or volunteer in a construction related job and want to earn college credit. Students can earn one unit of credit for each 60 hours of unpaid volunteer time or 75 hours of paid work during the semester. Students must have an office or field related construction job. Jobs aren't provided. Self-employed students working under valid contractor's licenses qualify. Volunteer opportunities can easily be found with local non-profits such as Habitat For Humanity. Volunteering gives students without previous construction work experience hands on experience that can be beneficial in obtaining a first construction job. The course qualifies as an elective for construction certificates and degrees. Students meet with the instructor three times during the semester. Students can repeat Career/ Technical Work Experience, combined with General Work Experience, or alone, up to a maximum of 16 units.

Lecture Hours: None Lab Hours: 2.07 Repeatable: Yes Grading: O  
Corequisite: Be employed or a volunteer at an approved work-site for the minimum number of hours per unit as stipulated for paid and unpaid status.  
Advisory Level: Read: 3 Write: 3 Math: None  
Transfer Status: CSU Degree Applicable: AA/AS  
For General Education (GE) information, please refer to assist.org (<https://assist.org>) or consult a counselor.

**CNSTR 500 Building Trades Apprenticeship 1 0 Units**

Students interested in becoming a union construction worker are introduced to the apprenticeship programs of the North American Building Trades Unions. Students will receive an overview of the building trades and construction industry, apprenticeship programs, as well as skills in construction math, safety awareness, and proper use of basic hand tools. Field trips may be included.

Lecture Hours: 3 Lab Hours: None Repeatable: Yes Grading: N  
Advisory Level: Read: 2 Write: 2 Math: None  
Transfer Status: None Degree Applicable: NC  
For General Education (GE) information, please refer to assist.org (<https://assist.org>) or consult a counselor.

**CNSTR 501 Building Trades Apprenticeship 2 0 Units**

Students interested in becoming a union construction worker increase their knowledge of apprenticeship program of the North American Building Trades Union. They will continue to learn contextualized construction math, history of labor unions, trades available, and gain awareness in workplace diversity. Students acquire skills to earn ASHI - approved adult CPR, AED and Basic First Aid certification. Field trips may be included.

Lecture Hours: None Lab Hours: 3 Repeatable: Yes Grading: N  
Recommended: CNSTR 500

Advisory Level: Read: 2 Write: 2 Math: None

Transfer Status: None Degree Applicable: NC

For General Education (GE) information, please refer to assist.org (<https://assist.org>) or consult a counselor.

**CNSTR 502 Building Trades Apprenticeship 3 0 Units**

Students interested in becoming a union construction worker advance their knowledge of apprenticeship program of the North American Building Trades Union. They will be introduced to blue prints and blue print reading and OSHA regulations in the workplace. They will continue examination of work place rights, career navigation techniques and employment interviewing. Field trips may be included.

Lecture Hours: None Lab Hours: 3 Repeatable: Yes Grading: N

Transfer Status: None Degree Applicable: NC

For General Education (GE) information, please refer to assist.org (<https://assist.org>) or consult a counselor.