

Construction

Overview

The Construction Technology programs at Cosumnes River College are preparing students for work in new construction, remodel, and energy auditing industries. Course offerings include everything from entry level trades courses, all the way to national certification. Students will train at the college, and at real jobsites. Traditional building practices are covered, but advanced framing techniques, energy efficiency, health and safety, and sustainability are emphasized.



Program Maps

[Construction, A.S. Degree \(/crc/main/doc/programs/program-maps/const-as-degree-ho.pdf\)](/crc/main/doc/programs/program-maps/const-as-degree-ho.pdf)

[Construction, Certificate of Achievement \(/crc/main/doc/programs/program-maps/const-cert-ho.pdf\)](/crc/main/doc/programs/program-maps/const-cert-ho.pdf)

[Construction, Pre-Apprenticeship, Certificate of Achievement \(/crc/main/doc/programs/program-maps/const-pre-appren-cert-ho.pdf\)](/crc/main/doc/programs/program-maps/const-pre-appren-cert-ho.pdf)

[Green Buildings: Environmental Design, Energy Management and Performance Based Construction, Certificate of Proficiency \(/crc/main/doc/programs/program-maps/green-buildings-cert-ho.pdf\)](/crc/main/doc/programs/program-maps/green-buildings-cert-ho.pdf)

Dean [Colette Harris-Mathews \(/about-us/contact-us/faculty-and-staff-directory/colette-harris-mathews\)](/about-us/contact-us/faculty-and-staff-directory/colette-harris-mathews)

Department Chair [Ryan Connally \(/about-us/contact-us/faculty-and-staff-directory/ryan-connally\)](/about-us/contact-us/faculty-and-staff-directory/ryan-connally)

Career and Academic Community [Automotive, Construction and Design Technology \(/academics/career-and-academic-communities/automotive-construction-and-design-technology\)](/academics/career-and-academic-communities/automotive-construction-and-design-technology)

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Associate Degree

A.S. in Construction

This program trains students for an industry that is one of the largest employers in the nation. CRC's construction program is designed to provide students with basic and applied technical skills and knowledge necessary for employment in the building and construction industry. Standard construction procedures are emphasized throughout the program.

HIGHLIGHTS

*Articulation agreements for transfer to specific four-year institutions

*Field trips to a variety of new and existing construction structures for study and appreciation

Catalog Date: June 1, 2020

Degree Requirements

COURSE CODE	COURSE TITLE	UNITS
CMT 112	Construction Estimating	3
CMT 120	Legal Aspects of Construction	3
CMT 136	Construction Safety	3
CMT 300	Introduction to Construction Plans and Specifications (3)	3
or BIT 102	Plan Reading and Non-Structural Plan Review (3)	
CMT 310	Materials of Construction	3
CMT 313	Computer Estimating for Construction	3
BIT 100	Introduction to the International Building Code	3
CONST 105	Rough Carpentry I - Tools, Materials, and Foundations	3
CONST 106	Rough Carpentry II - Floors, Walls, and Roof Framing	3
CONST 107	Rough Carpentry III - Exterior Finishes	3
CONST 108	Finish Carpentry I - Interior Finish	3
Total Units:		33

The Construction Associate in Science (A.S.) degree may be obtained by completion of the required program, plus general education requirements, plus sufficient electives to meet a 60-unit total. See CRC graduation requirements.

Student Learning Outcomes

Upon completion of this program, the student will be able to:

- PSLO #1: Career Options and Goals- Summarize career options in the industry, and formulate initial career goals.
- PSLO #2: Tools- Identify common hand and power tools used in the trades and residential building science, and demonstrate competence in their safe and efficient use.
- PSLO #3: Analysis of building materials- Examine various building materials, and compare their strengths and weaknesses as they relate to structural integrity, sustainability, and environmental impact.
- PSLO #4: Safety- Explain the relevance of the Occupational Safety and Health Administration, and interpret those regulations specific to the construction industry
- PSLO #5: Building principles- Utilize fundamental building principles to layout and construct residential and light carpentry structures
- PSLO #6: Analysis of Sustainability- Understand the principles of Green Building and compare and contrast emerging techniques with traditional production building methods.
- PSLO #7: Building Performance Testing- Perform shell and duct diagnostics, and prescribe measures that can be tested and retested for marked improvement in the energy efficiency of the home.

Career Information

Building and Construction Tradesperson; General Contracting; Estimators; Construction Supervisors; Material Salespersons; Building Inspection; Construction Apprenticeship programs. Some career options may require more than two years of college study. Classes beyond the associate degree may be required to fulfill some career options or for preparation for transfer to a university program.

Certificates of Achievement

Construction Pre-Apprenticeship Certificate

This program prepares students for entry into formal apprenticeship programs and other entry level jobs in the building and construction industry.

Catalog Date: June 1, 2020

Certificate Requirements

COURSE CODE	COURSE TITLE	UNITS
CONST 102	Introduction to Construction Practices	4
CONST 103	OSHA 10 Hour Safety Training	1
CONST 105	Rough Carpentry I - Tools, Materials, and Foundations	3
CONST 106	Rough Carpentry II - Floors, Walls, and Roof Framing	3
CONST 107	Rough Carpentry III - Exterior Finishes	3
CONST 108	Finish Carpentry I - Interior Finish	3
Total Units:		17

Enrollment Eligibility

To be eligible for enrollment in the program, the student must meet the following criteria:

- Students need to be able to lift 50 pounds and be willing to work outside in all weather conditions.
- Students need to be able and willing to travel to jobsites to build houses and various projects in conjunction with normal class hours.

Student Learning Outcomes

Upon completion of this program, the student will be able to:

- PSLO #1. Understand the career opportunities in the construction field including entry level expectations in various sectors, opportunities for an upward mobility, and strategies for career advancement.
- PSLO #2. Identify and safely operate many of the industry's common hand and power tools
- PSLO #3. Interpret basic working drawings for residential construction projects, and layout and erect basic floor, wall, and roof assemblies

Career Information

Entry level trades jobs, such as carpenter, electrician, plumber, cement mason. Those jobs can lead to other jobs such as foreman, superintendent, project manager, General contractor, estimator, scheduler, building inspector, safety manager, and even energy auditor.

Construction Certificate

This program prepares students for entry into the building and construction industry as a general tradesperson; and prepares students currently working within the industry for advancement.

Catalog Date: June 1, 2020

Certificate Requirements

COURSE CODE	COURSE TITLE	UNITS
CMT 112	Construction Estimating	3
CMT 136	Construction Safety	3
CMT 300	Introduction to Construction Plans and Specifications (3)	3
or BIT 102	Plan Reading and Non-Structural Plan Review (3)	
CMT 310	Materials of Construction	3
CONST 105	Rough Carpentry I - Tools, Materials, and Foundations	3
CONST 106	Rough Carpentry II - Floors, Walls, and Roof Framing	3
CONST 107	Rough Carpentry III - Exterior Finishes	3
CONST 108	Finish Carpentry I - Interior Finish	3
Total Units:		24

Student Learning Outcomes

Upon completion of this program, the student will be able to:

- PSLO #1: Career Options and Goals- Summarize career options in the industry, and formulate initial career goals.
- PSLO #2: Tools- Identify common hand and power tools used in the trades and residential building science, and demonstrate competence in their safe and efficient use.
- PSLO #3: Analysis of Building Materials- Examine various building materials, and compare their strengths and weaknesses as they relate to structural integrity, sustainability, and environmental impact.
- PSLO #4: Safety- Explain the relevance of the Occupational Safety and Health Administration, and interpret those regulations specific to the construction industry
- PSLO #5: Building Principles- Utilize fundamental building principles to layout and construct residential and light carpentry structures
- PSLO #6: Analysis of Sustainability- Understand the principles of Green Building and compare and contrast emerging techniques with traditional production building methods.
- PSLO #7: Building Performance Testing- Perform shell and duct diagnostics, and prescribe measures that can be tested and retested for marked improvement in the energy efficiency of the home.

Green Buildings Certificate

The purpose of this certificate is to develop job skills and an understanding of green strategies for high performance buildings and livable communities. It is focused at students and professionals in the fields of architecture; construction; building management; construction management; building inspection; design technology; landscape; and planning, who want to acquire a comprehensive knowledge of an integrated, economic life-cycle approach to the design of the built environment. It includes study of green rating systems, material choices and environmental strategies for a livable, sustainable future.

Catalog Date: June 1, 2020

Certificate Requirements

COURSE CODE	COURSE TITLE	UNITS
ARCH 342	Introduction to Green Buildings	3

COURSE CODE	COURSE TITLE	UNITS
CMT 310	Materials of Construction	3
A minimum of 12 units from the following:		12
ARCH 332	Design Awareness (3)	
ARCH 334	Advanced Design in Three Dimensions (3)	
ADT 320	Architectural Design Technology - Building Information Modeling (BIM) I (3)	
ADT 322	Architectural Design Technology - Building Information Modeling (BIM) II (3)	
BIT 150	California Energy Code – Building Energy Efficiency Standards (3)	
CONST 143	Photovoltaic Systems (3)	
ECON 306	Environmental Economics (3)	
GEOG 302	Environmental Studies & Sustainability (3)	
GEOG 305	Global Climate Change (3)	
GEOG 306	Weather and Climate (3)	
Total Units:		18

Student Learning Outcomes

Upon completion of this program, the student will be able to:

- PSLO 1: Establish meaningful ethical, social and environmental objectives for buildings and communities based on the values of energy and resource conscious design.
- Compare and contrast societal and economic implications of utilizing renewable and non-renewable energy sources.
- Compare and contrast the effect of contextual issues and evaluate their impact on energy consumption, environment and the beneficial experience of interior and exterior spaces.
- PSLO 2: Identify and articulate issues related to the choice of various building, landscape and environmental systems; ideate responsive solutions; and compare the alternatives in making effective, sustainable decisions.
- Analyze and calculate energy use to make informed, environmentally-sound and economic choices to satisfy human needs for comfort and aesthetics.
- Explain the concepts of resource conservation and waste reduction and make sustainable design choices related to materials and construction.
- Develop a comprehensive understanding of green rating systems, livable communities strategies and the ability to apply these concepts in decision-making.
- PSLO 3: Demonstrate independent learning, teamwork and continuing education habits that will help to encourage a life long pursuit of knowledge.
- To use a team work process to identify issues, analyze criteria, research and apply learned principles to synthesize solutions to specific design projects.
- To demonstrate habits of visual note making and independent research by developing a sketch and notebook to record learning.

Career Information

This certificate helps to develop the knowledge base related to sustainable green buildings and environments for the careers of architecture, construction, construction management, building inspection, horticulture, landscape architecture and architectural design technology.

Construction (CONST) Courses

CONST 102 Introduction to Construction Practices

Units:	4
Hours:	54 hours LEC; 54 hours LAB
Prerequisite:	None.
Catalog Date:	June 1, 2020

This course provides students with in-depth analysis of the organization and structure of the construction industry and the many career choices the industry offers. Many of the construction trades are represented, with formal apprenticeship opportunities highlighted. The emerging "Green Building" jobs will be examined, as well as other topics in sustainability. Guest speakers and field trips provide the students a wide view of the expectations of entry-level work, wages, benefits, and work place culture. The curriculum also emphasizes job site safety, practical working knowledge of tool and equipment use, an introduction to blueprints, and an overview of industry math.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO #1: Define the roles that safety plays in the construction industry.
- Predict and evaluate some of the common safety hazards on construction sites.
- Identify and operate various hand tools of the construction industry.
- Define the purpose of OSHA and their regulations for the construction industry.
- SLO #2: Comprehend and value the connection of the fundamental math skills required to lay out, build, and communicate in the construction industry.
- Solve basic math functions including addition, subtraction, multiplication, and division of whole numbers, fractions, and decimals.
- Demonstrate fluency reading a tape measure.
- Recognize and measure basic geometric shapes commonly used in the construction industry.
- Examine and interpret the drawings and symbols used in residential and light commercial construction.
- SLO #3: Summarize the major career paths in the construction industry, and their entry-level expectations.
- Research and list the various career paths in the construction industry.
- Compare and contrast the apprenticeship requirements and responsibilities for a variety of the construction trades.

- Understand the local and global mechanisms driving the emergence of Green Building practices, and define who the major industry organizations are and how they contribute to the movement.

CONST 103 OSHA 10 Hour Safety Training

Units:	1
Hours:	18 hours LEC
Prerequisite:	None.
Catalog Date:	June 1, 2020

This OSHA Outreach Training Program is for training construction students and industry workers in basic safety and health hazard recognition and prevention. This course is taught by authorized industry outreach trainers, and successful students will receive the OSHA 10 Hour card. Topics include: Intro to OSHA, Fall Protection, Electrical, Ladders and Stairs, Scaffolds, PPE, Hand and Power Tools, Hazcom, Motor Vehicles, Confined Space Entry, Fire Protection, and Ergonomics.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO #1-Recognize common workplace hazards on jobsites.
- avoid or prevent workplace health hazards.
- SLO #2- Understand the magnitude of the dangers involved with daily work activity in construction.
- Assess the impact that accidents have on the construction industry
- Discuss how daily work activities on a construction site may lead to a severely disabling injury and the effects this has on the worker and their families.

CONST 105 Rough Carpentry I - Tools, Materials, and Foundations

Units:	3
Hours:	27 hours LEC; 81 hours LAB
Prerequisite:	None.
Catalog Date:	June 1, 2020

This course is designed to teach the introductory skills required to be successful in the construction industry. Course topics include an Introduction to the Industry, Hand and Power Tools, Building Materials, Introduction to Plans and Building Codes, Site Layout and Foundations. A heavy emphasis is placed on "hands on" demonstration of proficiency with safe and efficient use of tools, plan reading, as well as the fundamental layout techniques for foundations.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO #1 - Demonstrate a fundamental understanding of the nature of the construction industry and the career opportunities to choose from.
- identify and describe the major historical milestones that have affected the technologies used in the construction industry
- summarize the current and future career opportunities for carpenters and other trades workers
- identify and discuss personal characteristics and responsibilities of a professional construction trades worker.
- SLO #2 - Identify common hand and power tools used in the construction industry and demonstrate competence in their safe and efficient use.
- perform hands-on demonstrations of competence in proper and safe power tool use
- discuss basic electrical safety
- SLO #3 - Examine various building materials and compare their strengths and weaknesses relative to other global resources and production methods
- compare and contrast solid sawn lumber with engineered wood products.
- discuss topics in sustainability, embodied energy of materials, and the green building movement
- describe the common fasteners and adhesives used in construction
- SLO #4- Recognize and interpret various construction drawings in a set of architectural plans
- estimate quantities of materials needed for simple, residential wood-framed building assemblies, using blueprints.
- SLO #5 - Utilize fundamental building principles to layout and construct concrete foundations
- apply techniques in plan reading, surveying, and layout to erect form work pour concrete for foundations

CONST 106 Rough Carpentry II - Floors, Walls, and Roof Framing

Units:	3
Hours:	27 hours LEC; 81 hours LAB
Prerequisite:	None.
Catalog Date:	June 1, 2020

This course is designed to teach the skills required to be successful in the construction industry. Course topics include Skill Development in Hand and Power Tool use, as well as techniques in Floor Framing, Wall Framing and Roof Framing. A heavy emphasis is placed on "hands-on" demonstration of proficiency with safe and efficient use of tools, plan reading, as well as the fundamental layout techniques for floor, wall, and roof framing.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO #1 - Identify common hand and power tools used in the construction industry and develop skills and competence in their safe and efficient use.
- Demonstrate fluency and skill development in tool use through the efficient, accurate, and safe use of individual tools.
- SLO #2 - Utilize fundamental building principles to layout and construct Floor Framing assemblies.
- Recognize and interpret various construction drawings to apply techniques in layout, cutting, and installation of floor framing members.
- SLO #3 - Utilize fundamental building principles to layout and construct exterior and interior wall Framing assemblies.
- Recognize and interpret various construction drawings to apply techniques in layout, cutting, and installation of wall framing members.
- SLO #4 - Utilize fundamental building principles to layout and construct various types of roof framing Framing assemblies.
- Recognize and interpret various construction drawings to apply techniques in layout, cutting, and installation of Stick framed and engineered roof truss framing assemblies.

CONST 107 Rough Carpentry III - Exterior Finishes

Units:	3
Hours:	27 hours LEC; 81 hours LAB
Prerequisite:	None.
Catalog Date:	June 1, 2020

This course is designed to teach the skills required to be successful in the construction industry. Course topics include skill development for hand and power tools, review of framing principles, windows and doors, insulation and ventilation, exterior siding, and roofing. A heavy emphasis is placed on "hands-on" demonstration of proficiency with safe and efficient use of tools, window and door installations, as well as siding and roofing.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO #1 - Demonstrate basic proficiency with the hand and power tools commonly associated with the installation of windows and doors, exterior siding, insulation and roofing.
- SLO #2 - Identify common types and styles of exterior doors and windows, and their proper installation techniques.
- Explain the proper procedure for setting exterior doors, as well as the common characteristics, dimensions, and materials used in their manufacture.
- Explain the proper procedure for setting exterior windows, with special emphasis on flashing techniques for water tightness, and smooth operation of moving parts.
- Evaluate and discuss the roll that windows play in the long term energy consumption of the building, and the current trends in energy code compliance.
- SLO #3 - Identify common types and styles of exterior siding, and roofing.
- SLO #4 - Identify common types and styles of insulation and ventilation strategies, commonly used in the industry.
- Evaluate and discuss the roll that insulation plays in the long term energy consumption of the building, and the current trends in energy code compliance.
- Explain the correlation between a building's thermal envelope, and the need to address mechanical ventilation in newer more air tight buildings.

CONST 108 Finish Carpentry I - Interior Finish

Units:	3
Hours:	27 hours LEC; 81 hours LAB
Prerequisite:	None.
Catalog Date:	June 1, 2020

This course is designed to teach the skills required to be successful in the construction industry. Course topics include Skill development with tools, Drywall, Interior doors and door frames, Interior trim, Stairs and cabinets. A heavy emphasis is placed on "hands-on" demonstration of proficiency with safe and efficient use of tools, drywall applications, as well as the accurate installation of interior trim.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO #1 - Identify common hand and power tools used in Interior finish and demonstrate competence and skill development in their safe and efficient use.
- SLO #2 - Identify commonly used materials and techniques used drywall applications, including various types of drywall, fasteners, and interior finishes.
- Demonstrate techniques in layout, cutting, fastening, and finishing drywall projects.
- SLO #3 - Utilize fundamental installation techniques to install interior doors and trim
- Identify the various styles of interior doors, and demonstrate how to interpret doors specified in working drawings.
- Demonstrate competence in installing interior doors.
- SLO #4 - Utilize fundamental building principles to layout, cut, and install stairs
- SLO #5 - Utilize fundamental installation practices to layout and install upper and lower unit cabinets.

CONST 142 Energy, Performance, and Indoor Air Quality

Units:	3
Hours:	54 hours LEC
Prerequisite:	None.
Catalog Date:	June 1, 2020

This course is intended to be the third in the series of Green Building courses, although the sequence is not mandatory. Each course in the series focuses on specific pieces of the larger Green Building sector. This course covers the following topics: The science of energy and its sources, as well as the common alternative and renewable sources of energy that are being researched and developed.

Green building guidelines and state energy efficiency standards for buildings and appliances will also be examined. The "Whole House approach" to Building Performance will be an undercurrent through out the course. Indoor Air Quality, and other health topics will be introduced. This course satisfies the elective units for the CRC Green Building Certificate.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO #1 Demonstrate the skills and competencies in Building Performance and Indoor Air Quality that will enable them to compete effectively in the emerging green building industry.
- demonstrate critical thinking skills showing their ability to research and predict the direction of the newest technologies and the advances in the use of existing materials and methods.
- SLO #2 Recognize common residential systems and construction assemblies, and identify typical deficiencies in those systems.
- Use the "Whole House Approach" to predict how common problems with systems and construction assemblies adversely affect other parts of the house.
- SLO #3 Calculate residential heating and cooling loads using Manual J, as well as determining heating and air conditioning equipment and duct sizes with Manual D and Manual S.

CONST 143 Photovoltaic Systems

Units: 3
Hours: 54 hours LEC
Prerequisite: None.
Catalog Date: June 1, 2020

This course will cover general solar industry topics with an emphasis photovoltaic principles and products. There will be a brief study of the political landscape in California in support of the California Solar Initiative, and market strategies and incentives will also be discussed. There will be some hands on projects to help students learn basic electrical theory and circuits, and an introduction to print reading. System Sizing and components will be covered as well. This class is part of the Green Buildings: Environmental Design, Energy Management and Performance Based Construction Certificate.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO#1 Demonstrate safe working practices associated with photovoltaic installations.
- SLO #2 Summarize the performance and operating characteristics of PV systems and components.
- differentiate between acceptable PV systems electrical installations and grounding.
- describe how interconnected PV systems can affect the utility.
- SLO #3 Further one's interests in a position, or general knowledge in the photo voltaic field.
- expand upon this course for a foundation of continued interest.

CONST 145 Advanced Solar Photovoltaic Systems

Units: 3
Hours: 45 hours LEC; 27 hours LAB
Prerequisite: CONST 143 with a grade of "C" or better
Catalog Date: June 1, 2020

This course reviews basic solar PV system basics, and will continue deeper into concepts in system sizing and wiring, utility interconnection requirements and policies, commissioning, maintenance and troubleshooting, economic analysis and business models, and will conclude with preparation for an external industry certification examination.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO #1-Review and describe the purpose and function of the major components in typical grid tied PV systems.
- SLO #2-Describe and differentiate the components in a PV system with on site energy storage.
- Understand differences between basic types and classifications of batteries.
- Articulate the economic analysis and feasibility of when battery storage systems make sense.
- SLO #3- Demonstrate proficiency in system design and system sizing.
- Show knowledge of site survey, load analysis, system losses, and interconnection requirements.
- SLO #4- Establish and explain appropriate installation and mechanical integration of system components.
- Describe various mounting systems and structural load analysis.
- Explain roof top safety, working clearances, common electrical fittings, and common hand and power tools.
- SLO #5- Summarize system commissioning and system maintenance.
- Identify commonly used electrical test equipment and the typical performance parameters that are commonly monitored for PV systems.
- Identify common factors that result in deviations from expected system performance.
- SLO #6- Describe the permitting and inspection process.

CONST 160 Introduction to Residential Building Performance

Units:	6
Hours:	81 hours LEC; 81 hours LAB
Prerequisite:	None.
Catalog Date:	June 1, 2020

This class focuses on preparing students for jobs within the Residential Building Performance and Weatherization industries. This class will train students in residential building science, energy efficiency, and combustion appliance safety. Topics will include nationally recognized Building Performance Institute standards and California Weatherization Installation Standards, Duct and Shell Sealing Measures, and Combustion Appliance Zone testing. This is the first course in the Residential Building Performance and Energy Assessment certificate.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO #1 Define the role that building performance and weatherization play in helping to reduce the demand for energy.
- Describe the cycle of energy production and consumption across the three major sectors of transportation, industry, and the built environment.
- Identify the energy saving measures performed in accordance with the state and nationally recognized standards.
- SLO #2 Perform shell and duct diagnostics, and prescribe measures that can be tested and retested for marked improvement in the energy efficiency of the home.
- Set up blower door testing equipment to depressurize a home, and test it for air leakage with the use of digital manometers and infrared cameras.
- Set up duct pressurizing equipment to measure duct leakage, a major source of energy waste.
- Analyze information gathered in both of these tests to prescribe cost effective remedies for improved energy efficiency in the home.
- SLO #3 Perform Combustion Appliance Safety Inspections.
- Detect defects and hazards in combustion appliances that may jeopardize the health and safety of the occupants

CONST 161 Intermediate Residential Building Performance and Energy Auditing

Units:	4
Hours:	54 hours LEC; 54 hours LAB
Prerequisite:	CONST 160 with a grade of "C" or better
Catalog Date:	June 1, 2020

This course focuses on preparing students for jobs in the Building Performance and Residential Energy Assessment industry. This class will train students about current auditing methods and standards including inspection, whole house performance diagnostics, building science, software applications for the energy professional, utility fee structure and bill disaggregation, and the industry's recognized rating systems. This course will also prepare the student for the Building Performance Institute "Building Analyst" exam.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO #1: Identify the industry's recognized energy assessment and audit measures.
- Examine the energy consuming devices in the home, and identify deficiencies in energy saving potential.
- Perform Combustion Appliance Safety inspections and make appropriate recommendations to insure occupant safety.
- SLO #2: Perform advanced whole house performance diagnosis with Blower Door and Duct Blasters.
- Set up the Blower Door and the Duct Blaster, and make appropriate recommendations for cost effective measures to reduce air leakage
- Use current software applications for the standardized and/or recognized audit, in conjunction with the results from the pressurizing equipment.

CONST 163 Advanced Energy Auditing and Energy Modeling

Units:	3
Hours:	54 hours LEC
Prerequisite:	None.
Advisory:	CONST 161
Catalog Date:	June 1, 2020

This course prepares students for jobs in the building performance and energy auditing industry. This class will train students in advanced energy auditing techniques using energy modeling software, and thermography. Students will be trained to use energy modeling software recognized by the California Energy Commission for both new and existing structures. Students will also be trained to use infra red imaging for accurate, non-invasive inspection of homes, assisting the auditor in locating thermal bridging in the building envelope. Topics in Multifamily and "Envelope Professional" certification will also be discussed.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO #1 Demonstrate entry level proficiency with energy modeling software.
- Collect and enter specific building information required to produce accurate energy efficiency ratings.
- SLO #2 Utilize infra red technology and imaging to assist in the energy auditing of a home.
- SLO #3 Perform the prescribed tests and protocols in the recognized national standards for "Envelope Professional" testing and certification.
- SLO #4 Discuss the current trends for testing and training for Multifamily, low rise, residential structures.

CONST 294 Topics in Green Building Technology

Units:	0.5 - 4
Hours:	9 - 54 hours LEC
Prerequisite:	None.
Catalog Date:	June 1, 2020

This course covers special topics not included in current green building classes. Topics may be offered in workshops or seminar presentations on timely subjects or targeted for specific audiences.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO #1 Demonstrate the skills and competencies that will enable them to compete effectively in the emerging green building industry.
- Students will demonstrate critical thinking skills showing their ability to research and predict the direction of the newest technologies and the advances in the use of existing materials.
- SLO #2 Communicate the importance of green building guidelines, and how green building methods help achieve these high standards
- Students will demonstrate competence in the commonly accepted green building criteria for both residential and commercial construction
- SLO #3 Compare and contrast a variety of green building materials and methods, and apply the appropriate technologies to meet a client's needs.
- Students will have comprehensive knowledge of many of the green building products, and their manufacturing processes. Students will see case studies of different combinations of green technologies used, and consider budget constraints.

CONST 298 Work Experience in Construction

Units:	1 - 4
Hours:	60 - 300 hours LAB
Prerequisite:	None.
Enrollment Limitation:	Students must be in a paid or unpaid internship, volunteer position or job related to career goals in Construction.
General Education:	AA/AS Area III(b)
Catalog Date:	June 1, 2020

This course provides students with opportunities to develop marketable skills in preparation for employment in their major field of study or advancement within their career. It is designed for students interested in work experience and/or internships in associate degree level or certificate occupational programs. Course content includes understanding the application of education to the workforce; completion of required forms which document the student's progress and hours spent at the work site; and developing workplace skills and competencies. Appropriate level learning objectives are established by the student and the employer. During the semester, the student is required to participate in a weekly orientation and 75 hours of related paid work experience, or 60 hours of unpaid work experience for one unit. An additional 75 or 60 hours of related work experience is required for each additional unit. Work Experience may be taken for a total of 16 units when there are new or expanded learning objectives. Only one Work Experience course may be taken per semester.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- DEMONSTRATE AN UNDERSTANDING AND APPLICATION OF PROFESSIONAL WORKPLACE BEHAVIOR IN A FIELD OF STUDY RELATED ONE'S CAREER.(SLO 1)
- Understand the effects time, stress, and organizational management have on performance.
- Demonstrate an understanding of consistently practicing ethics and confidentiality in a workplace.
- Examine the career/life planning process and relate its relevancy to the student.
- Demonstrate an understanding of basic communication tools and their appropriate use.
- Demonstrate an understanding of workplace etiquette.
- DESCRIBE THE CAREER/LIFE PLANNING PROCESS AND RELATE ITS RELEVANCY TO ONE'S CAREER.(SLO 2)
- Link personal goals to long term achievement.
- Display an understanding of creating a professional first impression.
- Understand how networking is a powerful job search tool.
- Understand necessary elements of a résumé.
- Understand the importance of interview preparation.
- Identify how continual learning increases career success.
- DEMONSTRATE APPLICATION OF INDUSTRY KNOWLEDGE AND THEORETICAL CONCEPTS AS WRITTEN IN LEARNING OBJECTIVES IN PARTNERSHIP WITH THE EMPLOYER WORK SITE SUPERVISOR.(SLO 3)

CONST 299 Experimental Offering in Construction

Units:	5
Hours:	72 hours LEC; 54 hours LAB
Prerequisite:	None.
Catalog Date:	June 1, 2020

This class focuses on preparing students for jobs within the weatherization industry. This class will train students in Weatherization Installation Standards, Duct and Shell Sealing Measures, and Combustion Appliance Safety. Students enrolled in Construction 299- Weatherization Standards, will sign up with the Sacramento Employment Training Agency, and receive funding for tools, books, and other support services, including job placement services, upon successful completion of the course, and an endorsement from the instructor.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO #1 Define the role that weatherization plays in helping to reduce the demand for energy
- Describe the cycle of energy production and consumption across the three major sectors of transportation, industry, and the built environment.
- Identify the energy saving measures performed in accordance with the "Conventional Home Weatherization Installation Standards".
- SLO #2 Perform shell and duct sealing measures that can be tested and retested for marked improvement in the energy efficiency of the home.
- Set up blower door testing equipment to depressurize a home, and test it for air leakage with the use of digital manometers and infrared cameras.
- Set up duct pressurizing equipment to measure duct leakage, a major source of energy waste.
- Analyze information gathered in both of these tests to prescribe cost effective remedies for improved energy efficiency in the home.
- SLO #3 Perform Combustion Appliance Safety Inspections.
- Detect defects and hazards in combustion appliances that may jeopardize the health and safety of the occupants.

Ryan Connally

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