ANTH 130 Prehistoric Cultures of North America (3)
3 hours lecture
Note: Cross listed as AIS 130
Transfer acceptability: CSU; UC
Emphasis given to prehistoric cultural traditions of the Eastern Woodlands, Central Plains, Far Western United States, and Canada. Special concern for archaeological problems, reconstruction of these traditions and cultural changes.

ANTH 135 Magic and Folk Religions (3)
3 hours lecture
Transfer acceptability: CSU; UC
Anthropological view of the relationships between magic and religion as expressed in rituals, myths, and art is explored through a survey of the less formal or minor religious systems of the world.

ANTH 137 Medical Anthropology: Culture, Illness and Healing (3)
3 hours lecture
Transfer acceptability: CSU
This course is a cross-cultural survey of health, illness and healing in small-scale societies as well as modern societies from a cultural, biological, and ecological perspective. Topics covered include perceptions of the body, perceptions of disease, life phases, culture-specific syndromes, healing practices, healers, nutrition, and healing and medical systems.

ANTH 140 The Original Californians (3)
3 hours lecture
Note: Cross listed as AIS 140
Transfer acceptability: CSU; UC
Native people of California: Their origin, language, arts, customs, religion, folklore, and music. Special emphasis on Southern California.

ANTH 155 Ancient Civilizations of Meso America (3)
3 hours lecture
Note: Cross listed as CS 155
Transfer acceptability: CSU; UC
Civilizations of Pre Columbian Mexico and Central America with a focus on their origins and achievements.

ANTH 197 Topics in Archaeology (1-3)
1 - 3 hours lecture - 3 - 9 hours laboratory
Transfer acceptability: CSU
Topics in Archaeological Research. See Class Schedule for specific topic offered. Course title will designate subject covered.

ANTH 205 Prehistoric Archaeological Excavation (3)
1 hour lecture - 6 hours laboratory
Recommended preparation: ANTH 120
Transfer acceptability: CSU
Training in excavating prehistoric archaeological features. Specialized field techniques for prehistoric archaeology. Archaeological theory as it applies to site interpretation.

ANTH 206 Historical Archaeological Excavation (3)
1 hour lecture - 6 hours laboratory
Transfer acceptability: CSU; UC
Training in excavating historic archaeological features. Specialized field techniques in historical archaeology. Archaeological theory as it applies to historic site interpretation.

ANTH 210 Archaeological Surveying (3)
2½ hours lecture - 1½ hours laboratory
Recommended preparation: ANTH 120
Transfer acceptability: CSU
Archaeological surveying techniques including field reconnaissance, use of topographical maps, site recording, and preparation of a project analysis or report.

ANTH 215 Archaeological Laboratory Analysis (3)
2½ hours lecture - 1½ hours laboratory
Transfer acceptability: CSU
Training in the laboratory analysis of stone, ceramic, bone, and other artifacts as well as elementary archaeological theory, statistics, and report preparation.

ANTH 220 Advanced Archaeological Surveying (3)
2½ hours lecture - 1½ hours laboratory
Recommended preparation: ANTH 210
Transfer acceptability: CSU
Advanced archaeological survey techniques including sample survey, site relocation, and the use of Global Positioning System (GPS) and laser transit hardware and software for site recordation, data conversion, site mapping, and the completion of a mapping program.

ANTH 225 Historical Archaeology (3)
2½ hours lecture - 1½ hours laboratory
Recommended preparation: ANTH 120
Note: May not be taken for Pass/No Pass grading
Transfer acceptability: CSU
Method and theory of historical archaeology, including archival research, artifact identification, and report preparation. Training in the location and interpretation of archival documents, such as Franciscan Mission records, Spanish land grant documents, homestead patents, Sanborn fire insurance maps, assessor’s records, and historical topographic maps. Training in the identification of ceramic, glass and metal artifacts and their associated function, method of manufacture, manufacturer, and temporal distribution.

ANTH 296 Special Problems in Anthropology (1, 2, 3)
3, 6, or 9 hours laboratory
Transfer acceptability: CSU; UC - Credit determined by UC upon review of course syllabus.
An individualized or group project in cultural or physical anthropology of any nature approved by the instructor and under the personal supervision of the instructor.

ANTH 297 Special Problems in Anthropology (1, 2, 3)
3, 6, or 9 hours laboratory
Transfer acceptability: CSU; UC - Credit determined by UC upon review of course syllabus.
An individualized or group project in anthropology approved by the instructor and under the personal supervision of the instructor.

ANTH 298 Internship in Anthropology (1-3)
3-9 hours laboratory
Transfer acceptability: CSU (pending)
Supervised internship in a government agency, private firm or museum. The student intern will have the opportunity to participate in the excavation and/or analysis, processing, and documentation of archaeological collections.

### Apprenticeship Training (AP)

- **Acoustical Installer, Carpentry, Drywall/Lather, Electrician, Inside Wireman, Plasterer, Sheet Metal, Sound and Communication Systems, Sound Technician**

Contact Occupational & Noncredit Programs for further information.
(760) 744-1150, ext. 2600
Office: AA-135

### Associate in Science Degrees -

A5 Degree requirements are listed in Section 6 (green pages).
- **Acoustical Installer**
- **Carpentry**
- **Drywall/Lather**
- **Electrician**
- **Inside Wireman**
- **Plasterer**
- **Sheet Metal**
- **Sound and Communication Systems Installer**
- **Sound Technician**
Certificates of Achievement -
Certificate of Achievement requirements are listed in Section 6 (green pages).
• Acoustical Installer
• Carpenter
• Drywall/Lather
• Electrician
• Inside Wireman
• Plasterer
• Sheet Metal
• Sound and Communication Systems Installer
• Sound Technician

PROGRAMS OF STUDY
A program for the training of apprentices, consisting of full-time, on-the-job employment plus related classroom instruction.

A CERTIFICATE OF ACHIEVEMENT and/or JOURNEYPERSON TRADE CERTIFICATE will be awarded to students for each program successfully completed. Students who wish to obtain an Associate in Arts Degree may do so by fulfilling the general graduation requirements in addition to the completion of the apprenticeship courses.

A program is maintained for the training of apprentices in the trades as listed. Students who wish to become apprentices should appear before the appropriate Joint Apprenticeship Committee. Training consists of full-time work on-the-job supplemented by related classroom instruction. All students entered in the apprenticeship work experience program are expected to enter AP WE 710, 711, 712, 713, or 714. A maximum of 16 units, Pass/No Pass only, may be earned in Cooperative Work Experience Education, not to exceed 8 units each semester.

Students whose work or attendance is not satisfactory may be dropped from the program by the College, or other corrective measures may be taken by the Joint Apprenticeship Committee. The College grants academic credit for the successful completion of the training program.

Upon completion of the training program, journeyperson trade certificates and college achievement certificates are awarded at a special completion ceremony.

SAFETY GLASSES - Education Code 32030-32034 requires that safety glasses be worn in those classes where eye damage might occur. Students in such classes will be so informed by their instructors. Glasses are available at the college bookstore.

Acoustical Installer (AP AC)
A three-year apprenticeship program. Applicants for this program should be directed to the Carpenters Joint Apprenticeship and Training Committee for Southern California, San Diego Carpenters Training Center, 8595 Miralani Drive, San Diego, CA 92126. Telephone (858) 621-2667.

A.S. DEGREE MAJOR OR CERTIFICATE OF ACHIEVEMENT

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<th>Program Requirements</th>
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<td>AP AC 704 Advanced Printreading</td>
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<td>AP AC 705 Acoustical Ceilings</td>
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<td>AP AC 706 Standard Acoustical Grids</td>
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<td>AP AC 707 Suspended Ceilings</td>
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<td>AP AC 708 Soffits</td>
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<td>AP AC 709 Prefab/Sound Panels</td>
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<td>AP AC 711 Designer and Specialty Trims</td>
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<tr>
<td>AP AC 712 Metal Pan and Security Systems</td>
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TOTAL UNITS 35.5

COURSE OFFERINGS

AP AC 701 Orientation (1.5)
1 hour lecture - 1½ hours laboratory
Prerequisite: Indentured apprentice to a designated Joint Apprenticeship and Training Committee
Note: Cross listed as AP DL 701/AP PL 701
An introduction to the Interior Systems program. Safe and proper use of hand tools, power tools, trade related math, beginning print reading and layout as well as safety certifications. Certifications will include scaffold erecter/dismantler (welded frame) and low velocity powder accuated tools.

AP AC 702 Safety and Health Certifications (1.5)
1 hour lecture - 1½ hours laboratory
Note: Cross listed as AP DL 702/AP PL 702
Instruction in safety and health training that meets the needs of the Interior Systems industry. Content includes certification in Power Industrial Trucks, Aerial Lift, American Red Cross First Aid / CPR / AED, and OSHA 10.

AP AC 703 Printreading (1.5)
1 hour lecture - 1½ hours laboratory
Note: Cross listed as AP DL 703/AP PL 703
An introduction to the basic visualization skills needed for reading and interpreting construction prints. Demonstration of the significance of views, elevations and the role of specifications as they relate to prints.

AP AC 704 Advanced Printreading (1.5)
1 hour lecture - 1½ hours laboratory
Prerequisite: A minimum grade of ‘C’ in AP AC 703/AP DL 703
Note: Cross listed as AP DL 704
In-depth training for on-the-job print reading situations. Covers advanced layout tasks and solutions to typical construction problems using plans and specifications for commercial construction projects.

AP AC 705 Acoustical Ceilings (1.5)
1 hour lecture - 1½ hours laboratory
Instruction in acoustical ceilings, seismic codes and the theory behind them. Wall molds and trims, ceiling layout and material identification. Students will install ceilings using the technical knowledge and skills.

AP AC 706 Standard Acoustical Grids (1.5)
1 hour lecture - 1½ hours laboratory
Designed with classroom instruction but will focus more on acoustical grid installation such as 2 x 4 and 2 x 2 flat AH@ pattern, radius, gable and diagonal ceilings.

AP AC 707 Suspended Ceilings (1.5)
1 hour lecture - 1½ hours laboratory
Designed with classroom instruction but will focus more on acoustical grid installation such as 2 x 4 and 2 x 2 flat AH@ pattern, radius, gable and diagonal ceilings.

AP AC 708 Soffits (1.5)
1 hour lecture - 1½ hours laboratory
Focus on square and slant faced, tapered, concealed, drywall suspension and sloped soffits.

AP AC 709 Prefab/Sound Panels (1.5)
1 hour lecture - 1½ hours laboratory
Focus on the technical knowledge and skills needed for the installation of prefabricated wall and ceiling panel systems. Acoustical principles and the theory of sound will be discussed.

AP AC 710 Concealed/Glue-Up/Staple-Up System (1.5)
1 hour lecture - 1½ hours laboratory
Instruction in concealed and semi-concealed ceilings and soffits, glue-up and staple-up. Technical knowledge and skills will be demonstrated in assembling these ceilings.
AP C 711  Designer and Specialty Trims  (1.5)
1 hour lecture - 1½ hours laboratory
This course is a more advanced look at specialty and designer trims for grid ceiling systems. Previous knowledge will be applied when laying out and installing straight and curved trims in soffit and light pocket designs, along with clouds, or free floating, trimmed ceilings.

AP C 712  Metal Pan and Security Systems  (1.5)
1 hour lecture - 1½ hours laboratory
Focus on the technical knowledge and skills needed to work with these “high end” products.

AP C 797  Acoustical Topics  (0.5 - 4)
Units awarded in topics courses are dependent upon the number of hours required of the student. Any combination of lecture and/or laboratory may be scheduled by the department. Refer to Class Schedule.
Topics in Acoustical. See Class Schedule for specific topic offered. Course title will designate subject covered.

Carpentry (AP C)
A four-year apprenticeship program. Applicants for this program should be direct to the Carpenters Joint Apprenticeship and Training Committee for Southern California, 8595 Miralani Drive, San Diego, CA 92126. Telephone (858) 621-2667.

A.S. DEGREE MAJOR OR CERTIFICATE OF ACHIEVEMENT

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<td>AP C 702  Safety and Health Certification</td>
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<td>AP WE 711  Carpenter Work Experience</td>
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Electives (Select 14 courses)

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<tr>
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<td>AP C 703  Printreading</td>
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<td>AP C 704  Advanced Printreading</td>
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<td>AP C 705  Foundation and Flatwork</td>
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<td>AP C 707  Tilt-Up Panel Construction</td>
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<td>AP C 708  Wall Forming</td>
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<td>AP C 710  Patented Forming Systems</td>
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<td>AP C 712  Column Forms</td>
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<td>AP C 713  Beam and Deck Forming</td>
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<td>AP C 714  Basic Commercial Framing</td>
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<td>AP C 716  Commercial Floor Framing</td>
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<td>AP C 717  Basic Stairs</td>
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<td>AP C 718  Advanced Stairs</td>
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<td>AP C 719  Exterior Finish Details</td>
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<td>AP C 721  Basic Roof Framing</td>
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<td>AP C 723  Basic Metal Framing</td>
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<td>AP C 725  Transit Level/Laser</td>
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<td>AP C 726  Bridge Construction</td>
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<td>AP C 728  Stair Trim</td>
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<td>AP C 729  Cabinet Millwork and Assembly</td>
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<td>AP C 730  Cabinet Installation</td>
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<td>AP C 735  Molding and Trim</td>
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<td>AP C 736  Plastic Laminates</td>
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<td>AP C 737  Door and Door Frames</td>
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<td>AP C 739  Door and Door Hardware</td>
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<td>AP C 745  Commercial Fixtures</td>
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<td>AP C 747  Basic Suspended Scaffolding</td>
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<td>AP C 748  Advanced Suspended Scaffolding</td>
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<td>AP C 750  Intermediate Systems Scaffolding</td>
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<td>AP C 751  Advanced Systems Scaffolding</td>
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<td>AP C 752  Basic Frame Scaffolding</td>
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<td>AP C 753  Intermediate Frame Scaffolding</td>
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<td>AP C 754  Advanced Frame Scaffolding</td>
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<td>AP C 755  Basic Tube &amp; Clamp Scaffolding</td>
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<td>AP C 756  Scaffold in Confined Spaces</td>
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<td>AP C 757  Specialty Scaffold Applications</td>
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<td>AP C 758  scaffold Restoring</td>
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<td>AP C 761  Basic Wall Framing</td>
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<td>AP C 764  Abutments</td>
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<td>AP C 770  Green Building and Weatherization</td>
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<td>AP C 771  Intermediate Commercial Framing</td>
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<td>AP C 772  Solar Installer Level I</td>
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<td>AP C 773  Water Treatment Facilities</td>
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<td>AP C 774  Tool and Equipment Applications</td>
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<tr>
<td>AP C 797  Carpenter Topics</td>
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TOTAL UNITS 40

COURSE OFFERINGS

AP C 701  Orientation  (1.5)
1 hour lecture - 1½ hours laboratory
Prerequisite: Indentured apprentice to the Carpenters Joint Apprenticeship and Training Committee for Southern California
Introduces the use of various hand and power tools used in the trade. Students will be introduced to the history of trade apprenticeships. Construction math and job site safety practices will also be covered.

AP C 702  Safety and Health Certification  (1.5)
1 hour lecture - 1½ hours laboratory
Prerequisite: A minimum grade of ’C’ in AP C 701
Covers the safe and appropriate use of scaffolds, aerial lift equipment, and emergency response procedures. Successful students will receive UBC Scaffold Erector and Aerial Lift Operator qualification cards. First Aid and CPR certification will be issued upon successful completion of the American Red Cross training provided.

AP C 703  Printreading  (1.5)
1 hour lecture - 1½ hours laboratory
The first of two classes in blueprint reading. Covers the fundamental functions and structure of blueprints. Construction drawings, line symbols, freehand sketching as well as pictorial drawings will be covered.

AP C 704  Advanced Printreading  (1.5)
1 hour lecture - 1½ hours laboratory
Prerequisite: A minimum grade of ‘C’ in AP C 703
Second of two courses in blueprint reading. Covers foundation prints, commercial prints, residential prints and estimating. Construction specifications will also be covered.

AP C 705  Foundation and Flatwork  (1.5)
1 hour lecture - 1½ hours laboratory
Covers the design and function of several types of foundations and concrete flatwork. The methods, techniques and procedures for formwork layout, elevation, and construction will be presented. Jobsite safety, print interpretation, material identification, and basic use of the builders level will be included in the training. Students will construct three selected formwork projects.

AP C 707  Tilt-Up Panel Construction  (1.5)
1 hour lecture - 1½ hours laboratory
Designed to give an overview of the Tilt-Up industry. Form techniques and panel hardware will be discussed. Related safety, math and blueprint reading will be covered.

AP C 708  Wall Forming  (1.5)
1 hour lecture - 1½ hours laboratory
Introduces the basic techniques of poured-in-place concrete wood form construction. Related safety, math and blueprint reading will be covered.

AP C 709  Gang Forms/Columns  (1.5)
1 hour lecture - 1½ hours laboratory
Presents the formwork types and construction methods for gang form and column installations. Discussions will cover heavy timber gang forms and use of taper ties, bracing, and bulkhead tables. The course project will include gang and column formwork construction, assembly, and hardware installation tasks. Related safety, math and print reading will be covered in the training.

See Catalog addendum at http://www.palomar.edu/catalog
AP C 710  Patented Forming Systems  
1 hour lecture - 1½ hours laboratory  
Covers the basic knowledge required to use blueprints for the purpose of properly laying out, locating, "leveling," "plumbing," "squaring," and preparing patented forming systems for concrete work/pours. Poured in place, tilt-up and precast above grade level structural concrete work including structural "load bearing" walls, decks and columns.

AP C 712  Column Forms  
1 hour lecture - 1½ hours laboratory  
Presents the formwork types and construction methods for column form installations. Discussions will cover structural significance of column layout, squaring, leveling and plumbing. The course project will include column formwork construction, assembly, and hardware installation tasks. Related safety, math and print-reading will be covered.

AP C 713  Beam and Deck Forming  
1 hour lecture - 1½ hours laboratory  
Introduction to the use of beam and deck forming systems for concrete construction. Students will identify formwork types and installation techniques including calculating materials and setting beam & deck forms. Metal beam forms and capitals will be highlighted. Layout and builders level skills will be used in this class.

AP C 714  Basic Commercial Framing  
1 hour lecture - 1½ hours laboratory  
Provides an introduction to the theory and practice of wall framing. Students start by learning to read floor plans, and then laying out wall locations, plate and detail, as well as openings and structural connections. Construction math and job site safety practices will also be covered.

AP C 716  Commercial Floor Framing  
1 hour lecture - 1½ hours laboratory  
Covers the layout and construction of both residential and commercial floor framing. The use of building codes and blueprint reading will be covered. Fall protection along with job site safety and construction math will also be covered.

AP C 717  Basic Stairs  
1 hour lecture - 1½ hours laboratory  
Stair construction is an integral part of the carpenter's trade. This course presents stair theory, related mathematics, code requirements, and basic layout strings, treads and risers. Students will layout, cut, and erect a straight-run stair. Blueprint reading and safety will also be covered.

AP C 718  Advanced Stairs  
1 hour lecture - 1½ hours laboratory  
Prerequisite: A minimum grade of 'C' in AP C 717  
Builds upon the concepts presented in Stair Building I. This class will teach students about winders, u-shaped and radius stair building, as well as code requirements and mathematical calculations. Blueprint reading and safety will also be covered.

AP C 719  Exterior Finish Details  
1 hour lecture - 1½ hours laboratory  
Teaches students to read blueprints related to building exteriors such as elevations, sections, and schedules. Construction of structural and architectural elements such as balconies, fireplaces, bay windows, columns and pop-outs. Blueprint reading, mathematical calculations and safety will also be covered.

AP C 721  Basic Roof Framing  
1 hour lecture - 1½ hours laboratory  
Roof construction is one of the most challenging and satisfying facets of carpentry. Introduces rafter theory and layout. Students will construct a gable roof using conventional and truss methods. Mathematical calculations for various rafter lengths and safety will also be covered.

AP C 722  Basic Metal Framing  
1 hour lecture - 1½ hours laboratory  
Introduces the student to the technology of metal framing. Tools and materials will be covered along with floor and wall construction, including openings and structural connections, and metal truss roof systems. Mathematical calculations for various rafter lengths and safety will also be covered.

AP C 725  Transit Level/Laser  
1 hour lecture - 1½ hours laboratory  
Addresses form design, material estimating and problems relative to form construction. Related safety, math and blueprint reading will be covered.

AP C 726  Bridge Construction  
1 hour lecture - 1½ hours laboratory  
Provides students with an overview of basic bridge construction. Descriptions for exterior and interior girders, edge forms, bulkheads and hinge forms will be presented. Formwork project will include panel construction, assembly, and hardware installation tasks. Related safety, math and print reading will be covered in the training.

AP C 727  Stair and Ramp Forming  
1 hour lecture - 1½ hours laboratory  
Designed to teach the various techniques used to form stairs and ramp structures. Related safety, math and blueprint reading will be covered.

AP C 728  Stair Trim  
1 hour lecture - 1½ hours laboratory  
Covers how various trims are utilized to finish stair construction design features. Product styles, characteristics, applications, and installation methods are included in the discussions. The tools and techniques for cutting and installing selected trim types are presented and practiced throughout the training.

AP C 729  Cabinet Millwork and Assembly  
1 hour lecture - 1½ hours laboratory  
Introduction to basic cabinet construction. Blueprint and finish schedules will be covered as well as related safety and math.

AP C 730  Cabinet Installation  
1 hour lecture - 1½ hours laboratory  
Installation of base and wall-hung cabinets, scribing techniques, and how to read blueprint and finish schedules. Related safety and math will also be covered.

AP C 735  Molding and Trim  
1 hour lecture - 1½ hours laboratory  
Introduction to various moldings and the specific installation techniques of each. Blueprint, finish schedules, related safety and math will also be covered.

AP C 736  Plastic Laminates  
1 hour lecture - 1½ hours laboratory  
Covers manufactured product styles, characteristics, and countertop applications. Materials used as countertop and backsplash substrates are discussed. Construction procedures and installation methods are presented, and students will apply the techniques to produce and install a plastic laminate countertop with backsplash.

AP C 737  Door and Door Frames  
1 hour lecture - 1½ hours laboratory  
Introduction to doors and door hardware schedules, specifications and manufacturer's catalogs. Fire codes that govern the hardware industry as well as how to identify various door hardware including locksets, closures, hinges, panic hardware and door sweeps etc. Blueprint, finish schedules, and related safety and math will also be covered.

AP C 739  Door and Door Hardware  
1 hour lecture - 1½ hours laboratory  
Introduction to the selection and installation of proper hinge and door-closure hardware. Blueprints, finish schedules, and related safety and math will also be covered.

AP C 745  Commercial Fixtures  
1 hour lecture - 1½ hours laboratory  
Includes print interpretation and fabrication techniques used in the preparation and installation of commercial store fixtures. An emphasis will be placed on accurate measuring, proper hand and power tool use, and safety. Students will calculate materials to create cut lists, and fabricate, assemble and install wall panel and valance fixtures.
AP C 747  Basic Suspended Scaffold (1.5)
1 hour lecture - 1½ hours laboratory
Basic techniques and procedures associated with suspended scaffolds. The terminology and use of scaffold components in a cable suspended configuration will be the focus of this training. Construction practices and safety will be taken into consideration as students erect equipment using project design plans for this cable suspended scaffold.

AP C 748  Advanced Suspended Scaffold (1.5)
1 hour lecture - 1½ hours laboratory
Advanced techniques and procedures required when constructing suspended scaffolds supported by structural members. Students will identify the suitable structural components for this application type. The methods used to determine load bearing capability of structural elements will be presented. The hazards and precautionary techniques associated with safely building this type of suspended platform will be the focus of this training.

AP C 749  Basic Systems Scaffold (1.5)
1 hour lecture - 1½ hours laboratory
Basic techniques and procedures associated with systems scaffold components. Terminology and components unique to this category of equipment will be discussed. Construction practices and safety considerations will be a major focus of the class. Students will identify and erect equipment using the custom configurations for jobsites where this type of scaffold is most frequently utilized.

AP C 750  Intermediate Systems Scaffold (1.5)
1 hour lecture - 1½ hours laboratory
Includes application of cantilevered design methods used to safely erect platforms extending beyond a typical scaffold base arrangement. Students will apply methods and erect equipment using custom configurations for jobsites.

AP C 751  Advanced Systems Scaffold (1.5)
1 hour lecture - 1½ hours laboratory
Covers the advanced techniques and procedures required when constructing system scaffolds used in industrial boiler installation or repair applications. Students will apply common solutions for bridging voids and following equipment contours to construct the selected industrial simulated scaffold projects.

AP C 752  Basic Frame Scaffold (1.5)
1 hour lecture - 1½ hours laboratory
Covers terminology, components and the basic techniques and procedures associated with frame scaffold components. Construction practices and safety considerations will be a major focus of the class. Students will choose and erect equipment using basic configurations suitable for jobsites where this type of scaffold is most frequently utilized.

AP C 753  Intermediate Frame Scaffold (1.5)
1 hour lecture - 1½ hours laboratory
Introduction of obstacle and height problem solving into frame scaffold project, to include equipment or overhead restrictions. Students will identify and erect equipment using custom configurations for jobsites.

AP C 754  Advanced Frame Scaffold (1.5)
1 hour lecture - 1½ hours laboratory
Covers the advanced techniques and procedures associated with ground supported frame scaffold, in particular the use of scaffold components for construction of various heavy-duty (industrial) elevated platforms. Safety precautions, building procedures and material utilization will be incorporated into the assigned tasks. Students will erect heavy-duty large scale platform scaffolds using project plans and designs for this industrial scaffold application.

AP C 755  Basic Tube and Clamp Scaffold (1.5)
1 hour lecture - 1½ hours laboratory
Covers the basic techniques and procedures associated with tube and clamp scaffold components and erection methods. Construction practices and safety considerations will be a major focus of the class. Students will learn to choose and erect equipment using custom configurations for jobsites.

AP C 756  Scaffold in Confined Spaces (1.5)
1 hour lecture - 1½ hours laboratory
Instruction in safe access, entry and monitoring methods for confined space. Both CAL-OSHA and Federal OSHA regulation are covered in detail. The importance of a respirator fit test and respiratory protection training are covered in this course.

AP C 757  Specialty Scaffold Applications (1.5)
1 hour lecture - 1½ hours laboratory
Includes specialty scaffold applications focusing on ramps, chutes and mobile towers suitable for light and heavy duty use. Students will learn the characteristics of commercial and industrial scaffold construction. Selected projects will introduce the techniques and procedures used for access/egress, debris handling, and maintenance scaffolds.

AP C 758  Scaffold Reshoring (1.5)
1 hour lecture - 1½ hours laboratory
Present students with the modified principles and techniques for the use of shoring equipment in a re-shore application. The importance of uniform loading and alignment of multi-tower/tandem tower configurations will be covered. Students will identify and erect scaffold equipment using three types of configurations suitable for scaffold re-shoring purposes.

AP C 761  Basic Wall Framing (1.5)
1 hour lecture - 1½ hours laboratory
Presents the theory, methods, and procedures required to frame basic walls. Hands-on practice using proper tool techniques and appropriate materials will enhance fundamental skill development. Beginning with an introduction to print reading, students will perform: basic wall layout, placing procedures; framing assembly and bracing before aligning and completing selected wall construction project to industry standards.

AP C 764  Abutments (1.5)
1 hour lecture - 1½ hours laboratory
Provides instruction in the detailing, layout and construction of abutments used in the heavy highway industry. The terms, components, materials, building techniques and procedures will be presented. The class project includes keyway, panel, head wall and wing wall construction.

AP C 770  Green Building and Weatherization (1.5)
1 hour lecture - 1½ hours laboratory
Energy efficiency, “green” building methods, rating systems and commissioning will be discussed. Products, techniques, and weatherizing procedures used for new buildings and retro-fit buildings will be included in hands-on activities. Practices and devices used to maintain healthy air quality during construction will be a focus of the training.

AP C 771  Intermediate Commercial Framing (1.5)
1 hour lecture - 1½ hours laboratory
Enhances basic wall framing theory and wall construction techniques are applied at increased skill levels. A review of basic wall framing and floor plans used for job planning, design recognition, and materials lists is included. Students will layout and detail wall plates for locating basic wall components and door openings. Instruction includes measuring skills, mathematical principles, wall assembly and installation procedures, and detail how structural connections are made.

AP C 772  Solar Installer Level I (1.5)
1 hour lecture - 1½ hours laboratory
Covers the design and function of several types of solar installation. The methods, sequences and procedures for foundation layout, elevation, and assembly for solar construction will be presented. Jobsite safety, print interpretation, material identification, and use of system devices and testing criteria will be stressed. Students will construct three selected solar installation projects.

AP C 773  Water Treatment Facilities (1.5)
1 hour lecture - 1½ hours laboratory
Instruction in the detailing, layout, and construction of concrete formwork and watertop used in water treatment facilities. The terms, components, materials, building techniques and procedures will be presented. The class project includes keyway, panel, watertop, head wall and wing wall construction.
**Total Units:** 34  

**Drywall/Lather (AP DL)**

A three-year apprenticeship program. Applicants for this program should be directed to the Carpenters Joint Apprenticeship and Training Committee for Southern California, San Diego Carpenters Training Center, 8595 Miralani Drive, San Diego, CA 92126. Telephone (858) 621-2667.

### A.S. Degree Major or Certificate of Achievement

<table>
<thead>
<tr>
<th>Program Requirements</th>
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<td>Orientation 1.5</td>
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<tr>
<td>AP DL/AP AC 702</td>
<td>Safety and Health Certifications 1.5</td>
</tr>
<tr>
<td>AP DL/AP AC 703</td>
<td>Printreading 1.5</td>
</tr>
<tr>
<td>AP DL/</td>
<td>Basic Lathing 1.5</td>
</tr>
<tr>
<td>AP DL 706</td>
<td>Framing Ceilings and Soffits 1.5</td>
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<td>AP DL 707</td>
<td>Basic Metal Framing 1.5</td>
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<td>AP DL 709</td>
<td>Framing Curves and Arches 1.5</td>
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<tr>
<td>AP DL 710</td>
<td>Light Gage Welding - AWS - A 1.5</td>
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<tr>
<td>AP WE 712</td>
<td>Drywall/Acoustical Work Experience 16</td>
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**Electives (Select 3 courses)**

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<tr>
<td>AP DL/</td>
<td>Advanced Printreading 1.5</td>
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<tr>
<td>AP DL 704</td>
<td>Framing Ceilings and Soffits 1.5</td>
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<td>AP WE 712</td>
<td>Drywall/Acoustical Work Experience 16</td>
</tr>
</tbody>
</table>

**TOTAL UNITS** 34

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### COURSE OFFERINGS

**AP DL 701** Orientation  
1 hour lecture - 1½ hours laboratory  
Prerequisite: Indentured apprentice to a designated Joint Apprenticeship and Training Committee  
Note: Cross listed as AP PL 701/AC 701

An introduction to the Interior Systems program. Safe and proper use of hand tools, power tools, trade related math, beginning print reading and layout as well as safety certifications. Certifications will include scaffold erector/dismantler (welded frame) and low velocity powder actuated tools.

**AP DL 702** Safety and Health Certifications  
1 hour lecture - 1½ hours laboratory  
Note: Cross listed as AP PL 702/AC 702

Instruction in safety and health training that meets the needs of the Interior Systems Industry. Content includes certification in Power Industrial Trucks, Aerial Lift, American Red Cross First Aid / CPR / AED, and OSHA 10.

**AP DL 703** Printreading  
1 hour lecture - 1½ hours laboratory  
Note: Cross listed as AP PL 703/AC 703

An introduction to the basic visualization skills needed for reading and interpreting construction prints. Demonstration of the significance of views, elevations and the role of specifications as they relate to prints.

**AP DL 704** Advanced Printreading  
1 hour lecture - 1½ hours laboratory  
Prerequisite: A minimum grade of 'C' in AP DL/AC 703  
Note: Cross listed as AP AC 704

In-depth training for on-the-job print reading situations. Covers advanced layout tasks and solutions to typical construction problems using plans and specifications for commercial construction projects.

**AP DL 705** Basic Lathing  
1 hour lecture - 1½ hours laboratory  
Note: Cross listed as AP PL 705

Presents the basic lathing methods used in the industry for exterior/interior installations. Students will use the skills presented to complete a lathing project as part of this course.

**AP DL 706** Framing Ceilings and Soffits  
1 hour lecture - 1½ hours laboratory  
This course is designed to provide instruction in the basics of framing ceilings and soffits with drywall and lath application. Related safety, math and blueprint reading will be covered.

**AP DL 707** Basic Metal Framing  
1 hour lecture - 1½ hours laboratory  
An in-depth study of basic material identification, print layout, framing, drywall applications and proper trim applications for the Drywall/Lath industry. Safety, math and blueprint reading will be covered.

**AP DL 708** Framing Suspended Ceilings  
1 hour lecture - 1½ hours laboratory  
This course is designed to provide related classroom instruction with the technical skills and knowledge to successfully frame any suspended ceiling in drywall and lath. Related hand and power tool safety, math and blueprint reading will be covered.

**AP DL 709** Framing Curves and Arches  
1 hour lecture - 1½ hours laboratory  
Provides instruction in framing methods for curves and arches and their related structural limitations. Students will use the skills presented to complete a framing project that includes curves and arches as part of this course.

**AP DL 710** Light Gage Welding - AWS - A  
1 hour lecture - 1½ hours laboratory  
Designed to teach the practical skills needed for the arc welding processes and applications. Students will have the practical skills to successfully pass the AWS light gage certification. Related safety, codes and materials will be covered.
Apprenticeship Training

AP DL 711 Light Gage - L.A. City Certificate (1.5)  
1 hour lecture - 1½ hours laboratory  
Assists students in preparing for the Los Angeles City Light Gage Welding Certification. Written and practical skills of the test will be demonstrated and discussed in order to associate the student with the working knowledge necessary to successfully achieve a Los Angeles City Light Gage Welding Certification. Related safety, codes and materials will be covered.

AP DL 712 Basic Hand Finishing (1.5)  
1 hour lecture - 1½ hours laboratory  
Develop basic hand finishing skills using the correct tools and materials. Includes a description of finishing levels, hand tool manipulation, material identification, selection, and mixture preparation. Key processes and application techniques will be presented. Students will review plans and specifications, calculate and select materials, and complete a wall project to a level four finish.

AP DL 713 Drywall Acoustical Ceilings (1.5)  
1 hour lecture - 1½ hours laboratory  
Identifies the materials and methods used for the installation of acoustical ceilings. Seismic codes, materials, and requirements are also reviewed. Installation for various grid systems will be discussed. Students will use the skills presented to complete an acoustical ceiling project as part of this course.

AP DL 714 Door/Door Frames (1.5)  
1 hour lecture - 1½ hours laboratory  
Introduction to the basic installation of door frames and various types of doors. Lock sets, closures, hinges, panic hardware, and door sweeps will be discussed and demonstrated.

AP DL 715 Exterior Insulation Finish Systems (EIFS) (1.5)  
1 hour lecture - 1½ hours laboratory  
Note: Cross listed as AP PL 715  
Introduction to the basic working knowledge and technical skills needed to successfully install Exterior Insulation and Finish Systems EIFS (foam products) to meet industry specifications and standards. Introduction to the proper usage of products and materials will be discussed and used.

AP DL 716 Firestop/Fireproofing Procedures (1.5)  
1 hour lecture - 1½ hours laboratory  
Note: Cross listed as AP PL 716  
Emphasis on the correct methods, technical skills and firestop materials required to complete a Firestop System. Firestopping is a complete fire containment system designed to prevent the passage of fire, smoke and hot gasses from one side of a rated wall/ceiling assembly to another.

AP DL 717 Free-Form Lathing (1.5)  
1 hour lecture - 1½ hours laboratory  
Introduction to the techniques and skills needed for construction of freeform lath projects. Layout techniques using grids and projection overlay will be presented. Methods for bending and shaping of rebar and pencil rod, lath handling and tying along with welding and cutting techniques will be demonstrated and applied.

AP DL 718 Automatic Finishing Tools (1.5)  
1 hour lecture - 1½ hours laboratory  
Advanced instruction in blueprints, finish schedules, and machine parts identification, as well as proper use, assembly and breakdown of tools.

AP DL 720 Drywall Installation/Finish Trims (1.5)  
1 hour lecture - 1½ hours laboratory  
Instruction in the basics of gypsum board application and finish trims.

AP DL 721 Advanced Hand Finishing (1.5)  
1 hour lecture - 1½ hours laboratory  
In depth instruction in hand tool use. The different operations, phases, and materials to be used in order to have information of what a finished product should look like.

AP DL 722 Advanced Automatic Finishing Tools (1.5)  
1 hour lecture - 1½ hours laboratory  
Instruction in the proper methods and sequences of the “bazooka,” flat boxes, nail spotters and angle boxes.

AP DL 724 Ceiling and Soffit Finishing (1.5)  
1 hour lecture - 1½ hours laboratory  
Designed to provide an advanced level of finishing skill for applications with architecturally detailed ceilings and soffits. Guided practice with a combination of hand and automatic tool techniques will promote the level of manipulative ability required for a successful result. A variety of finish trims will be integrated into each method of finish. Training will conclude with inspection criteria for evaluating finish levels.

AP DL 729 Advanced Metal Framing (1.5)  
1 hour lecture - 1½ hours laboratory  
Review of basic metal framing and detailed procedures for framing curved, serpentine, and elliptical non load bearing partitions.

AP DL 797 Drywall/Lather Topics (.5 - 4)  
Units awarded in topics courses are dependent upon the number of hours required of the student. Any combination of lecture and/or laboratory may be scheduled by the department. Refer to Class Schedule.

Prerequisite: Indentured apprentice to the Carpenters Joint Apprenticeship and Training Committee for Southern California  
Topics in Drywall/Lather: See Class Schedule for specific topic offered. Course title will designate subject covered.

Electrician (AP E)  
A five-year apprenticeship program. Applications for Riverside/San Bernardino/Mono/Inyo counties should apply to the Riverside and San Bernardino Joint Electrical Apprenticeship Training. Committees, 1855 Business Center Drive, San Bernardino, CA 92408. Telephone: (909) 890-1703.

A.S. DEGREE MAJOR OR CERTIFICATE OF ACHIEVEMENT

Program Requirements  

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
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<tbody>
<tr>
<td>AP E 701</td>
<td>Electrical Trade/Industry/DC/Conduit</td>
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<tr>
<td>AP E 702</td>
<td>Electrical Theory/Practice/Blueprint Reading</td>
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</tr>
<tr>
<td>AP E 703</td>
<td>Inductance/Capacitance Theory</td>
<td>4</td>
</tr>
<tr>
<td>AP E 704</td>
<td>Transformers/Code Calculations/Conduit</td>
<td>4</td>
</tr>
<tr>
<td>AP E 705</td>
<td>Electronic/Industrial Blueprints</td>
<td>4</td>
</tr>
<tr>
<td>AP E 706</td>
<td>Grounding/Electrical Services/Connection</td>
<td>4</td>
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<tr>
<td>AP E 707</td>
<td>Motor Control/Pilot Devices/Starter</td>
<td>4</td>
</tr>
<tr>
<td>AP E 708</td>
<td>Digital Electronics</td>
<td>4</td>
</tr>
<tr>
<td>AP E 709</td>
<td>Mgmt/Alarms/Testing/Wiring</td>
<td>4</td>
</tr>
<tr>
<td>AP E 710</td>
<td>Programmable Logic Controllers</td>
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</tr>
<tr>
<td>AP WE 713</td>
<td>Electrician Work Experience</td>
<td>16</td>
</tr>
</tbody>
</table>

TOTAL UNITS 56

COURSE OFFERINGS

AP E 701 Introduction to the Electrical Trade and Industry, DC Theory and Conduit Bending (4)  
3 hours lecture - 3 hours laboratory  
Prerequisite: Completion of the following: (1) One semester of Algebra 1 with a grade of ‘C’ or better; (2) Designated tests with a passing grade determined by the appropriate committee; (3) Indentured apprentice to the San Diego Electrical Joint Apprenticeship and Training Committee or the Riverside and San Bernardino Joint Electrical Apprenticeship Training Committee.  
Orientation to the electrical industry; introduction to the electrical code fundamentals of wiring methods, fastening devices, electrical conductors, circuits, and voltage.

AP E 702 Electrical Theory, Practice and Blueprint Reading (4)  
3 hours lecture - 3 hours laboratory  
Prerequisite: A minimum grade of ‘C’ in AP E 701  
Study of floor and plot plan; basic blueprint reading and circuit drawing; theory of magnetism; DC and AC generators; motors and transformers; on-the-job safety and first aid, and the electrical code.
AP E 703  Inductance and Capacitance Theory and Codeology (4)
3 hours lecture - 3 hours laboratory
Prerequisite: A minimum grade of ‘C’ in AP E 702

AP E 704  Transformers and Code Calculations, Conduit Bending and Blueprints (4)
3 hours lecture - 3 hours laboratory
Prerequisite: A minimum grade of ‘C’ in AP E 703
Study of transformers theory, installation, connection and distribution systems. Performing short circuit calculations, selecting of building wire for specific applications, calculating loads for residential and multifamily loads and service feeders. Applying conduit bending principles using mechanical benders to fabricate segmented concentric bends.

AP E 705  Introduction to Electronics and Industrial Blueprints (4)
3 hours lecture - 3 hours laboratory
Prerequisite: A minimum grade of ‘C’ in AP E 704
Introduction to basic electronics including examination of semiconductor devices, current and voltage manipulation, applications, and blueprint reading.

AP E 706  Grounding, Electrical Services, and Transform Three-Phase Connections (4)
3 hours lecture - 3 hours laboratory
Prerequisite: A minimum grade of ‘C’ in AP E 705
Study of requirements for electrical services installation. Study of electrical grounding including merits, impact on safety, ground fault protection, and identification of grounding system elements and functions.

AP E 707  Electrical Motor Control, Pilot Devices, Starters and Relays (4)
3 hours lecture - 3 hours laboratory
Prerequisite: A minimum grade of ‘C’ in AP E 706
Study of controls and circuits, pilot devices, starters, and relays. Includes the analysis and development of circuits, the installation and service of electrical equipment, and the electrical code.

AP E 708  Digital Electronics (4)
3 hours lecture - 3 hours laboratory
Prerequisite: A minimum grade of ‘C’ in AP E 707
Introduction to digital electronic technology and electronic equipment. Instruction includes basic digital systems, binary and decimal numbering systems, decision-making logic circuits, Boolean Algebra, flip-flops, counters, shift registers, encoders, decoders, ROMs, DC to AC converters and organization of these components blocks to accomplish manipulation of data.

AP E 709  Management, Fire Alarms, High Voltage Testing, and Telephone and Security Wiring (4)
3 hours lecture - 3 hours laboratory
Prerequisite: A minimum grade of ‘C’ in AP E 708
Introduction to management and marketing practices, installation of fire alarm systems and the National Electric Code as it relates to alarm installation and high voltage of telephone wiring and security systems.

AP E 710  Programmable Logic Controllers (4)
3 hours lecture - 3 hours laboratory
Prerequisite: A minimum grade of ‘C’ in AP E 709
Introduction to basic input/output hardware, processors and memory numbering systems associated with programmable controllers. Instruction includes use of personal computer to create and modify ladder diagrams and relay instructions, using solid state logic elements, counters, and shift registers. Principles of process control are explained and principle components are identified.

AP E 797  Electrical Topics (.5 - 4)
Units awarded in topics courses are dependent upon the number of hours required of the student. Any combination of lecture and/or laboratory may be scheduled by the department. Refer to Class Schedule.
Prerequisite: Indentured apprentice to the San Diego Electrical Joint Apprenticeship and Training Committee or the Riverside and San Bernardino Joint Electrical Apprenticeship Training Committee
Concentrated courses on electricity. Course title will designate subject covered.

Inside Wireman (AP IW)
A five-year apprenticeship program. Study of technical course development and delivery techniques for the electrical trade, utilizing classroom-proven techniques. The student will familiarize him/herself with classroom management, testing and assessment techniques, curriculum development and material presentation based on industry-standard and college level instructional methodologies. Applications for this program should be directed to the San Diego Electrical Training Trust, 4675 Viewridge Avenue, San Diego, CA 92123. Telephone (858) 569-6633, ext. 111.

A.S. DEGREE MAJOR OR CERTIFICATE OF ACHIEVEMENT

Program Requirements

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<tr>
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<td>AP IW 702 Electrical Theory, Practice and Blueprint Reading</td>
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<tr>
<td>AP IW 703 Inductance and Capacitance Theory</td>
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<tr>
<td>AP IW 704 Transformer, Motors, and Motor Controls</td>
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<tr>
<td>AP IW 705 Special Electrical Systems</td>
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<td>AP IW 706 Specialized Electrical Applications</td>
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<td>AP WE 713 Electrician Work Experience</td>
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<td>Electives (Select 16 units)</td>
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<td>AP IW 713 Electrical Project Supervision</td>
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<td>AP IW 714 Electrical Certification Preparation</td>
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<tr>
<td>AP IW 716 Photovoltaics</td>
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<td>AP IW 725 Building Automation Systems</td>
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<td>AP IW 726 Electrical Construction Practices</td>
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<tr>
<td>AP IW 797 Inside Wireman Topics</td>
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</tr>
</tbody>
</table>

TOTAL UNITS 56

COURSE OFFERINGS

AP IW 701 Introduction to the Electrical Trade (4)
3 hours lecture - 3 hours laboratory
Prerequisite: One semester of Algebra I with a grade of ‘C’ or better, designated tests with a passing grade determined by the appropriate committee, and indentured apprentice to the San Diego Electrical Joint Apprenticeship and Training Committee or the Riverside and San Bernardino Joint Electrical Apprenticeship Training Committee.
Introduction to the electrical industry, with emphasis on jobsite safety, basic conduit bending, National Electric Code (NEC), sexual harassment, introduction to blueprints, tools and their use. Particular attention will be given to fastening devices, basic mathematics, resistance, voltage, power in DC series, parallel, and combination circuits.

AP IW 702 Electrical Theory, Practice and Blueprint Reading (4)
3 hours lecture - 3 hours laboratory
Prerequisite: A minimum grade of ‘C’ in AP IW 701
Survey of drug awareness, Union Constitution and Bylaws, parliamentary procedures, test instruments, 3Ø electrical systems, DC and AC power generation, specialized conduit bending techniques, National Electric Code (NEC), solid state devices, blueprint analysis, AC theory, transformers, vector analysis, impedance, voltage, power in AC series, parallel, and combination circuits.

AP IW 703 Inductance and Capacitance Theory (4)
3 hours lecture - 3 hours laboratory
Prerequisite: A minimum grade of ‘C’ in AP IW 702
Study of circuit analysis techniques, power factor, semiconductors, AC system grounding and bonding, ground fault protection systems, overcurrent protective devices (fuse and circuit breakers), test instruments, National Electric Code (NEC), and industrial blueprint analysis.
AP IW 704  Transformer, Motors, and Motor Controls  (4)
3 hours lecture - 3 hours laboratory
Prerequisite: A minimum grade of 'C' in AP IW 703
Study of real-world application of transformer, motor and motor control concepts utilizing extensive hands-on labs and demonstrations. Students work in foremen-led teams to design, build, and test motor control circuits. Students will gain familiarity with a wide array of test instruments including DMMs, voltage testers, megohmmeters, clamp-on ammeters, capacitance testers and other equipment.

AP IW 705  Special Electrical Systems  (4)
3 hours lecture - 3 hours laboratory
Prerequisite: A minimum grade of 'C' in AP IW 704
Introduction to telephony and data networks, fire alarm systems, nurse call systems, Programmable Logic Controllers (PLCs), arc-flash protection, and instrumentation concepts, National Electric Code (NEC), and OSHA rules and regulations.

AP IW 706  Specialized Electrical Applications  (4)
3 hours lecture - 3 hours laboratory
Prerequisite: A minimum grade of 'C' in AP IW 705
Introduction to electrical power quality, CATV and CCTV Systems, security systems, fiber optics, hazardous locations, lightning protection, advanced conduit bending, HVAC principles and controls, blueprints, and leadership skills.

AP IW 713  Electrical Project Supervision  (4)
3 hours lecture - 3 hours laboratory
Prerequisite: A minimum grade of 'C' in AP IW 706
An overview of all processes required to run a successful job. The class utilizes field trips and speakers to give the student a 360° view of the workplace. Each speaker will bring expertise from the field into the classroom where students will learn the right and the wrong way to organize and run a jobsite.

AP IW 714  Electrical Certification Preparation  (4)
3 hours lecture - 3 hours laboratory
Prerequisite: A minimum grade of 'C' in AP IW 706
Designed to prepare the student to take the California Electrician Certification Examination (CECE). Provides a review of concepts and principles, but focuses primarily on understanding and applying the national Electric Code (NEC), the set of standards upon which the CECE is based.

AP IW 716  Photovoltaics  (4)
3 hours lecture - 3 hours laboratory
Prerequisite: A minimum grade of 'C' in AP IW 706
Technologies and installation requirements for photovoltaic systems. Subjects presented in this course are renewable energy construction, renewable energy resources, renewable energy efficiency, and energy savings devices used in construction.

AP IW 725  Building Automation Systems  (4)
3 hours lecture - 3 hours laboratory
Prerequisite: A minimum grade of 'C' in AP IW 706
Technologies and installation requirements for Building Automation Systems (BAS). The subjects presented in this course are Building Automation applications and requirements used in the construction of commercial and industrial buildings. This course allows students to practice the technical skills required to successfully install, commission, and verify operation of a wide variety of advanced components, such as photosensors, occupancy sensors, digital dimming networked and wireless control systems, programmable time clocks, and emergency lighting controls. In addition, it comprehensively addresses the requirements, regulations, products and strategies which will enable electricians to master successful, expert, and professional customer relations, installation, and maintenance of Electric Vehicle (EV) and Plug-in Hybird Electric Vehicle (PHEV) infrastructure.

AP IW 726  Electrical Construction Practices  (4)
3 hours lecture - 3 hours laboratory
Prerequisite: A minimum grade of 'C' in AP IW 706
The technologies and skill sets required for installing and provisioning the electrical requirements for commercial or industrial facilities. The topics presented in this course include electrical distribution overview, safety, OSHA requirements, shoring, trenching, Sempra Service Guide requirements, rigging, IEEE Standards, Blueprints, CSI Master Format construction specifications and National Electrical requirements for electrical services and distribution systems.

AP IW 797  Inside Wireman Topics  (2 - 4)
Units awarded in topics courses are dependent upon the number of hours required of the student. Any combination of lecture and/or laboratory may be scheduled by the department. Refer to Class Schedule. Topics in Inside Wireman. See Class Schedule for the specific topic offered. Course title will designate subject covered.

Plasterer (AP PL)
A four-year apprenticeship program. Applicants for this program should be directed to the Carpenters Joint Apprenticeship and Training Committee for Southern California, San Diego Carpenters Training Center, 8595 Miralani Drive, San Diego, CA 92126. Telephone (858) 621-2667.

A.S. DEGREE MAJOR OR CERTIFICATE OF ACHIEVEMENT

Program Requirements  Units
AP DL/AP PL/  
AP AC 701 Orientation  1.5
AP DL/AP PL/  
AP AC 702 Safety and Health Certifications  1.5
AP DL/AP PL/  
AP AC 703 Printreading  1.5
AP DL/  
AP PL 705 Basic Lathing  1.5
AP PL 706 Basic Plastering  1.5
AP PL 707 Exterior Plastering  1.5
AP PL 708 DOT and Scree Techniques  1.5
AP PL 709 Interior Plastering  1.5
AP PL 710 Finish Applications  1.5
AP PL 711 Ornamental Plastering  1.5
AP PL/  
AP DL 715 Exterior Insulation Finish Systems (EIFS)  1.5
AP PL/  
AP DL 716 Firestop/Fireproofing Procedures  1.5
AP PL 717 Plastering Equipment Application  1.5
AP PL 718 Plastering Equipment  1.5

TOTAL UNITS 21

COURSE OFFERINGS

AP PL 701  Orientation  (1.5)
1 hour lecture - 1½ hours laboratory
Prerequisite: Indentured apprentice to a designated Joint Apprenticeship and Training Committee
Note: Cross listed as AP DL 701I / AP AC 701
An introduction to the Interior Systems program. Safe and proper use of hand tools, power tools, trade related math, beginning print reading and layout as well as safety certifications. Certifications will include scaffold erector/dismantler (welded frame) and low velocity powder actuated tools.

AP PL 702  Safety and Health Certifications  (1.5)
1 hour lecture - 1½ hours laboratory
Note: Cross listed as AP DL 702I / AP AC 702
Instruction in safety and health training that meets the needs of the Interior Systems industry. Content includes certification in Power Industrial Trucks, Aerial Lift, American Red Cross First Aid / CPR / AED, and OSHA 10.
AP PL 703 Printreading (1.5)
1 hour lecture - 1½ hours laboratory
Note: Cross listed as AP DL 7031 AP AC 703
An introduction to the basic visualization skills needed for reading and interpreting construction prints. Demonstration of the significance of views, elevations and the role of specifications as they relate to prints.

AP PL 705 Basic Lathing (1.5)
1 hour lecture - 1½ hours laboratory
Note: Cross listed as AP DL 705
Presents the basic lathing methods used in the industry for exterior/interior installations. Students will use the skills presented to complete a lathing project as part of this course.

AP PL 706 Basic Plastering (1.5)
1 hour lecture - 1½ hours laboratory
This course provides a brief history of plastering and a complete picture of what the plastering industry is like today. The importance of good lathing and proper inspection of lathing will be emphasized. Proper hawk and trowel and basic tool use will be demonstrated.

AP PL 707 Exterior Plastering (1.5)
1 hour lecture - 1½ hours laboratory
An introduction to Portland Cement Plaster (a.k.a. stucco) and the processes involved in completing a plastering job. This course will stress the importance of good workmanship and adherence to proven methods of work. Students will begin to develop mastery of basic plastering tools in this course.

AP PL 708 DOT and Screed Techniques (1.5)
1 hour lecture - 1½ hours laboratory
This course is designed to teach the importance of plumb and square projects. The students will use 3-4-5 or center line methods to square the project, establish control lines and wall finish lines. The plumbing of the project will be demonstrated through the dotting and screeding portion of instruction. The student will brown up and finish a project using methods of application previously covered.

AP PL 709 Interior Plastering (1.5)
1 hour lecture - 1½ hours laboratory
An introduction to modern gypsum interior plastering systems. Proper methods of application, proper proportioning and mixing, and good workmanship will be demonstrated in this course.

AP PL 710 Finish Applications (1.5)
1 hour lecture - 1½ hours laboratory
The course will emphasize three different types of molds, their use and application. Components and production of a mold, how to horse a mold and create inside and outside miters will also be covered.

AP PL 711 Ornamental Plastering (1.5)
1 hour lecture - 1½ hours laboratory
A minimum grade of 'C' in AP PL 710
Prerequisite: A minimum grade of 'C' in AP PL 710
This course is designed to provide instruction and practice in advanced geometric layout problems. Class project will guide students through each phase of production to produce an elliptical arch, with keystone at the arch apex. The project will introduce students to benching a mold, setting and pointing staff, building a working trammel and successfully running a trammel mold.

AP PL 715 Exterior Insulation Finish Systems (EIFS) (1.5)
1 hour lecture - 1½ hours laboratory
Note: Cross listed as AP DL 715
Introduction to the basic working knowledge and technical skills needed to successfully install Exterior Insulation and Finish Systems EIFS (foam products) to meet industry specifications and standards. Introduction to the proper usage of products and materials will be discussed and used.

AP PL 716 Firestop/Fireproofing Procedures (1.5)
1 hour lecture - 1½ hours laboratory
Note: Cross listed as AP DL 716
Emphasis on the correct methods, technical skills and firestop materials required to complete a Firestop System. Firestopping is a complete fire containment sys-

AP PL 717 Plastering Equipment Application (1.5)
1 hour lecture - 1½ hours laboratory
Instruction in the materials, application methods and techniques for operating a plaster pump. Students will complete a three-coat work application to industry standards. Emphasis on proper pump set-up, washout and maintenance.

AP PL 718 Plastering Equipment (1.5)
1 hour lecture - 1½ hours laboratory
Terminology, components and operating procedures for plastering equipment and machinery. Machine maintenance, safety, troubleshooting procedures, limits of operation and communication practices will be covered. Students will inspect and properly set up and clean a plastering pump.

AP PL 719 Plasterer Topics (5–4)
Units awarded in topics courses are dependent upon the number of hours required of the student. Any combination of lecture and/or laboratory may be scheduled by the department. Refer to Class Schedule.
Prerequisite: Indentured apprentice to the Carpenters Joint Apprenticeship and Training Committee for Southern California.
Topics in Plasterer. See Class Schedule for specific topic offered. Course title will designate subject covered.

Sheet Metal (AP SM)
A five-year apprenticeship program. Applicants for this program should be directed to the San Diego Sheet Metal Joint Apprenticeship and Training Committee, 4596 Mission Gorge Place, San Diego, CA 92120. Telephone (619) 265-2758.

A.S. DEGREE MAJOR OR CERTIFICATE OF ACHIEVEMENT

Program Requirements

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<tr>
<td>AP WE 710</td>
<td>Sheet Metal Work Experience</td>
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TOTAL UNITS 55

COURSE OFFERINGS

AP SM 701 Core I
3 hours lecture - 3 hours laboratory
Prerequisite: Indentured apprentice to the San Diego Sheet Metal Joint Apprenticeship and Training Committee
An introduction to the basic principles, processes, drawings, materials and practices used in the sheet metal industry.

AP SM 702 Core II
3 hours lecture - 3 hours laboratory
Prerequisite: A minimum grade of 'C' in AP SM 701
A continuation of basic sheet metal processes as well as an introduction to simple sheet metal forming processes.

AP SM 703 Core III
3 hours lecture - 3 hours laboratory
Prerequisite: A minimum grade of 'C' in AP SM 702
An introduction to intermediate sheet metal processes demonstrating job layout, architectural details and construction techniques with problems of unusual complexity and difficulty.
Apprenticeship Training

AP SM 704  Core IV  (4)
3 hours lecture - 3 hours laboratory
Prerequisite: A minimum grade of ‘C’ in AP SM 703
A continuation of intermediate processes with problems of unusual difficulty and complexity.

AP SM 705  Sheet Metal Welding  (3)
1/2 hours lecture - 4/8 hours laboratory
Prerequisite: A minimum grade of ‘C’ in AP SM 704
An introduction to the basic principles and methods of gas and arc welding used in the sheet metal industry. Includes codes, standards, welding theory and the practical application using prescribed welding procedures and equipment.

AP SM 706  Plans and Specifications  (4)
3 hours lecture - 3 hours laboratory
Prerequisite: A minimum grade of ‘C’ in AP SM 705
An introduction to the language and organization of plans and specifications for sheet metal projects. Topics will include architectural, structural, mechanical and electrical drawings as well as how to write and implement a change order to plans and specifications.

AP SM 709  Foreman and Project Management Training  (4)
3 lecture hours - 3 hours laboratory
Prerequisite: A minimum grade of ‘C’ in AP SM 712
Overview of the knowledge, skills and abilities required to effectively perform as a foreman and project manager in the sheet metal industry.

AP SM 710  Architectural Application  (4)
3 hours lecture - 3 hours laboratory
Prerequisite: A minimum grade of ‘C’ in AP SM 709
Overview of the knowledge, skills, and abilities of advanced architectural project performance.

AP SM 711  HVAC I  (4)
3 hours lecture - 3 hours laboratory
Prerequisite: A minimum grade of ‘C’ in AP SM 706
An introduction to the physical components and systems of a basic HVAC system as well as hands-on techniques for startup and basic system troubleshooting.

AP SM 712  HVAC II  (4)
3 hours lecture - 3 hours laboratory
Prerequisite: A minimum grade of ‘C’ in AP SM 711
Designed to build on the principles of basic HVAC system design and installation. Students will develop a better understanding of how a modern HVAC system is designed and functions. Field installation, plans and specifications, commissioning, project management and basic LEED principles will also be covered.

AP SM 797  Sheet Metal Topics  (.5 - 4)
Units awarded in topics courses are dependent upon the number of hours required of the student. Any combination of lecture and/or laboratory may be scheduled by the department. Refer to Class Schedule.
Prerequisite: Indentured apprenticeship to the San Diego Sheet Metal Joint Apprenticeship and Training Committee in Sheet Metal. See Class Schedule for specific topic offered. Course title will designate subject covered.

Sound and Communication Systems

Installer (AP SC)
A three-year apprenticeship program. Applicants for this program should be directed to the Riverside and San Bernardino Joint Electrical Apprenticeship Training Committees, 1855 Business Center Drive, San Bernardino, CA 92408. Telephone: (909) 890-1703.

A. S. DEGREE MAJOR OR CERTIFICATE OF ACHIEVEMENT

Program Requirements  Units
AP SC 701  Intro to Sound/Communication Trade Industry  4
AP SC 704  Electrical Theory and Practices AC  4
AP SC 705  Semiconductor Electronics  4
AP SC 706  Management/Alarms/Codes/Circuits  4
AP SC 707  Electrician Work Experience  16

TOTAL UNITS  40

Sound Technician (AP SC)
A four-year apprenticeship program. Students will work in the field during the day and attend class in the evenings. Each apprentice is paid for field work with regularly scheduled pay increases based on required work hours and completion of classroom instruction. Upon completion of this program, students will receive a certificate of completion from the California Division of Apprenticeship Standards and Journeyman Sound Technician status in the I.B.E.W. All students must be indentured Sound Technical apprentices to be eligible for the course. Interested applicants from San Diego/Imperial counties should apply to the San Diego Electrical Training Trust, 4675 Viewridge Avenue, San Diego, CA 92123. Telephone: (858) 569-6633, extension 111.

A. S. DEGREE MAJOR OR CERTIFICATE OF ACHIEVEMENT

Program Requirements  Units
AP SC 701  Intro to the Sound/Communication Trade Industry  4
AP SC 702  Electrical Theory and Practices DC  4
AP SC 703  Electrical Theory and Practices AC  4
AP SC 704  Semiconductor Electronics  4
AP SC 705  Introduction to Digital Electronics  4
AP SC 706  Management/Alarms/Codes/Circuits  4
AP SC 707  Life Safety and Security System Applications  4
AP SC 708  Specialized Systems and Supervision Techniques  4
AP WE 713  Electrician Work Experience  16

TOTAL UNITS  48

COURSE OFFERINGS

AP SC 701  Introduction to the Sound and Communication Trade Industry  (4)
3 hours lecture - 3 hours laboratory
Prerequisite: A minimum grade of ‘C’ in MATH 50. Completion of designated tests with a passing grade determined by the appropriate committee. Indentured Apprentice to the Riverside, San Bernardino, Mono, and Inyo Counties Sound and Communications Joint Apprenticeship Committee or the San Diego Sound & Communications Joint Apprenticeship Committee.
Introduction to the sound and communication industry, electrical code, fundamentals of wiring methods, fastening devices, electrical conductors, circuits, voltage and data communication.

AP SC 702  Electrical Theory and Practices DC  (4)
3 hours lecture - 3 hours laboratory
Prerequisite: A minimum grade of ‘C’ in AP SC 701
Study of floor and plot plans, basic blueprint reading and circuit drawing, theory of magnetism, DC and AC generators, motors and transformers, on-the-job safety, first aid, electrical code, telephony and data communications.

AP SC 703  Electrical Theory and Practices AC  (4)
3 hours lecture - 3 hours laboratory
Prerequisite: A minimum grade of ‘C’ in AP SC 702
Study of apprenticeship, electrical induction, capacitance and reactance, including grounded conductors, branch circuits, transformer principles, RCL circuits and filters.

AP SC 704  Semiconductor Electronics  (4)
3 hours lecture - 3 hours laboratory
Prerequisite: A minimum grade of ‘C’ in AP SC 703
Study of solid-state electronic theory and components, diodes, transistors, SCR, triacs, diacs, IC amplifiers and op-amps.

See Catalog addendum at http://www.palomar.edu/catalog
AP SC 705  Introduction to Digital Electronics and Signaling Devices  (4)
3 hours lecture - 3 hours laboratory
Prerequisite: A minimum grade of ‘C’ in AP SC 704
Introduction to digital electronic technology and electronic equipment. Instruction includes basic digital systems, binary and decimal numbering systems, decision-making logic circuits, Boolean Algebra, flip-flops, counters, shift registers, encoders, decoders, ROMs, DC to AC converters and organization of these component blocks to accomplish manipulation of data.

AP SC 706  Management/Alarms/Codes/Circuits  (4)
3 hours lecture - 3 hours laboratory
Prerequisite: A minimum grade of ‘C’ in AP SC 705
Supervised on-the-job training in the Interior Systems Trade.

AP SC 707  Life Safety and Security System Applications  (4)
3 hours lecture - 3 hours laboratory
Prerequisite: A minimum grade of ‘C’ in AP SC 706
Supervised on-the-job training in the Carpentry trade.

AP SC 708  Specialized Systems and Supervision Techniques  (4)
3 hours lecture - 3 hours laboratory
Prerequisite: A minimum grade of ‘C’ in AP SC 707
Introduction to management, installation of security and fire alarm systems, the National Electrical Code as it relates to alarm installation and circuits as applied to alarm systems.

AP SC 709  Sheet Metal Work Experience  (4)
12 hours laboratory
Prerequisite: Indentured apprentice to a designated Joint Apprenticeship and Training Committee
Note: Pass/No Pass grading only
Supervised on-the-job training in the Sheet Metal Trade.

AP SC 710  Electrician Work Experience  (4)
12 hours laboratory
Prerequisite: Indentured apprentice to a designated Joint Apprenticeship and Training Committee
Note: Pass/No Pass grading only
Supervised on-the-job training in the Electrician trade.

AP WE 711  Drywall/Acoustical Work Experience  (4)
12 hours laboratory
Prerequisite: Indentured apprentice to a designated Joint Apprenticeship and Training Committee
Note: Pass/No Pass grading only
Supervised on-the-job training in the Interior Systems Trade.

Arabic (ARAB)

Contact the World Languages Department for further information.
(760) 744-1150, ext. 2390
Office: H-201

COURSE OFFERINGS

ARAB 101  Arabic I  (5)
5 hours lecture - 1 hour laboratory
Note: Not open to students with credit for ARAB 101B; corresponds to two years of high school study.
Transfer acceptability: CSU; UC
This course is the first semester of Arabic. This elementary level course is a study of the Arabic language and Arabic-speaking cultures, with emphasis on the development of communicative skills and basic structures. Course combines in-class instruction and practice with self-paced study in the World Languages Laboratory. This beginning-level course is for students with no previous coursework in Arabic.

ARAB 101A  Arabic IA  (3)
3 hours lecture
Note: Covers the first half of first semester Arabic; not open to students with credit for ARAB 101
Transfer acceptability: CSU; UC
Arabic 101A and 101B are equivalent to the first semester of an elementary level course in Arabic. This elementary level course is a study of the Arabic language and Arabic-speaking cultures, with emphasis on the development of communicative skills and basic structures. This beginning-level course is for students with no previous coursework in Arabic.

ARAB 101B  Arabic IB  (3)
3 hours lecture
Prerequisite: A minimum grade of ‘C’ in ARAB 101A or one year of high school Arabic
Note: Covers the second half of first semester Arabic; not open to students with credit for ARAB 101; corresponds to two years of high school study.
Transfer acceptability: CSU; UC
Arabic 101A and 101B are equivalent to the first semester of an elementary level course in Arabic. ARAB 101B is a continuation of ARAB 101A. This elementary level course is a study of the Arabic language and Arabic-speaking cultures, with emphasis on the development of communicative skills and basic structures.

ARAB 102  Arabic II  (5)
5 hours lecture - 1 hour laboratory
Prerequisite: A minimum grade of ‘C’ in ARAB 101 or two years of high school Arabic
Transfer acceptability: CSU; UC
Note: Not open to students with credit for ARAB 102B
This course is the second semester of Arabic. This elementary level course is a study of the Arabic language and Arabic-speaking cultures, with continued emphasis on the development of communicative skills and basic structures. Course combines in-class instruction and practice with self-paced study in the World Languages Laboratory.