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 Archaeology (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 archaeology approved by the instructor and under the personal supervision of the instructor.

ANTH 298 Internship in Archaeology (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 -

AS 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
- Carpentry
- 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

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 AC 704	Advanced Printreading	1.5
AP AC 705	Acoustical Ceilings	1.5
AP AC 706	Standard Acoustical Grids	1.5
AP AC 707	Suspended Ceilings	1.5
AP AC 708	Soffits	1.5
AP AC 709	Prefab/Sound Panels	1.5
AP AC 710	Concealed/Glue-Up/Staple-Up System	1.5
AP AC 711	Designer and Specialty Trims	1.5
AP AC 712	Metal Pan and Security Systems	1.5
AP AC 715	Drywall Acoustical Ceilings	1.5
AP WE 712	Drywall/Acoustical Work Experience	16
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 erector/dismantler (welded frame) and low velocity powder actuated 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 AC 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 AC 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 AC 715 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 forvarious grid systems will be discussed. Students will use the skills presented tocomplete an acoustical ceiling project as part of this course.

AP AC 797 Acoustical 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.
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 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 C 701	Orientation	1.5
AP C 702	Safety and Health Certification	1.5
AP WE 711	Carpentry Work Experience	16
Electives (Select 14 courses)		
AP C 703	Printreading	1.5
AP C 704	Advanced Printreading	1.5
AP C 705	Foundation and Flatwork	1.5
AP C 707	Tilt-Up Panel Construction	1.5
AP C 708	Wall Forming	1.5
AP C 709	Gang Forms/Columns	1.5
AP C 710	Patented Forming Systems	1.5
AP C 712	Column Forms	1.5
AP C 713	Beam and Deck Forming	1.5
AP C 714	Basic Commercial Framing	1.5
AP C 716	Commercial Floor Framing	1.5
AP C 717	Basic Stairs	1.5
AP C 718	Advanced Stairs	1.5
AP C 719	Exterior Finish Details	1.5
AP C 721	Basic Roof Framing	1.5
AP C 723	Basic Metal Framing	1.5
AP C 725	Transit Level/Laser	1.5
AP C 726	Bridge Construction	1.5
AP C 727	Stair and Ramp Forming	1.5
AP C 728	Stair Trim	1.5
AP C 729	Cabinet Millwork and Assembly	1.5
AP C 730	Cabinet Installation	1.5
AP C 735	Molding and Trim	1.5
AP C 736	Plastic Laminates	1.5
AP C 737	Door and Door Frames	1.5
AP C 739	Door and Door Hardware	1.5
AP C 745	Commercial Fixtures	1.5

AP C 747	Basic Suspended Scaffold	1.5
AP C 748	Advanced Suspended Scaffold	1.5
AP C 749	Basic Systems Scaffold	1.5
AP C 750	Intermediate Systems Scaffold	1.5
AP C 751	Advanced Systems Scaffold	1.5
AP C 752	Basic Frame Scaffold	1.5
AP C 753	Intermediate Frame Scaffold	1.5
AP C 754	Advanced Frame Scaffold	1.5
AP C 755	Basic Tube & Clamp Scaffold	1.5
AP C 756	Scaffold in Confined Spaces	1.5
AP C 757	Specialty Scaffold Applications	1.5
AP C 758	Scaffold Reshoring	1.5
AP C 761	Basic Wall Framing	1.5
AP C 764	Abutments	1.5
AP C 770	Green Building and Weatherization	1.5
AP C 771	Intermediate Commercial Framing	1.5
AP C 772	Solar Installer Level I	1.5
AP C 773	Water Treatment Facilities	1.5
AP C 774	Tool and Equipment Applications	1.5
AP C 797	Carpentry Topics	1.5
TOTAL UNITS		**40**

COURSE OFFERINGS

AP C 701 Orientation (1.5)
1 hour lecture - 1½ hours laboratory
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
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
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.

AP C 710 Patented Forming Systems (1.5)
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 (1.5)
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 (1.5)
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 (1.5)
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 (1.5)
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 (1.5)
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 stringers, 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 (1.5)
1 hour lecture - 1½ hours laboratory
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 (1.5)
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 (1.5)
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 723 Basic Metal Framing (1.5)
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 (1.5)
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 (1.5)
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 (1.5)
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 (1.5)
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 (1.5)
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 (1.5)
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 (1.5)
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 (1.5)
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 (1.5)
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 (1.5)
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 (1.5)
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 muti-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; plating 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 devises 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 1 (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 waterstop used in water treatment facilities. The terms, components, materials, building techniques and procedures will be presented. The class project includes keyway, panel, waterstop, head wall and wing wall construction.

AP C 774 Tool & Equipment Applications (1.5)
1 hour lecture - 1½ hours laboratory
This course promotes hand/power tool and equipment skill development for various construction applications. Scaffold building, aerial lift safety, and operating procedures will be covered. Upon successful completion, students will be issued United Brotherhood of Carpenters (UBC) Aerial Lift and Scaffold Erector-Welded Frame Qualification Cards.

AP C 797 Carpentry 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.
Topics in Carpentry. See Class Schedule for specific topic offered. Course title will designate subject covered.

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

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 DL 706	Framing Ceilings and Soffits	1.5
AP DL 707	Basic Metal Framing	1.5
AP DL 708	Framing Suspended Ceilings	1.5
AP DL 709	Framing Curves and Arches	1.5
AP DL 710	Light Gage Welding - AWS - A	1.5
AP WE 712	Drywall/Acoustical Work Experience	16
Electives (Select 3 courses)		
AP DL/ AP AC 704	Advanced Printreading	1.5
AP DL 711	Light Gage - L.A. City Certification	1.5
AP DL 712	Basic Hand Finishing	1.5
AP DL 713	Drywall Acoustical Ceilings	1.5
AP DL 714	Door/Door Frames	1.5
AP DL/ AP PL 715	Exterior Insulation Finish Systems (EIFS)	1.5
AP DL/ AP PL 716	Firestop/Fireproofing Procedures	1.5
AP DL 717	Free-Form Lathing	1.5
AP DL 718	Automatic Finishing Tools	1.5
AP DL 720	Drywall Installation/Finish Trims	1.5
AP DL 721	Advanced Hand Finishing	1.5
AP DL 722	Advanced Automatic Finishing Tools	1.5
AP DL 724	Ceiling and Soffit Finishing	1.5
AP DL 729	Advanced Metal Framing	1.5
AP DL 797	Drywall Lather Topics	.5-4
TOTAL UNITS		**34**

COURSE OFFERINGS

AP DL 701 Orientation (1.5)
1 hour lecture - 1½ hours laboratory
Note: *Cross listed as AP PL 701/ 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 DL 702 Safety and Health Certifications (1.5)
1 hour lecture - 1½ hours laboratory
Note: *Cross listed as AP PL 702/ 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 DL 703 Printreading (1.5)
1 hour lecture - 1½ hours laboratory
Note: *Cross listed as AP PL 703/ 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 DL 704 Advanced Printreading (1.5)
1 hour lecture - 1½ hours laboratory
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 (1.5)
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 (1.5)
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 (1.5)
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 (1.5)
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 (1.5)
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 (1.5)
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.

AP DL 711 Light Gage - L.A. City Certification (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.

See Catalog addendum at http://www.palomar.edu/catalog

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.
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		Units
AP E 701	Electrical Trade/Industry/DC/Conduit	4
AP E 702	Electrical Theory/Practice/Blueprint Reading	4
AP E 703	Inductance/Capacitance Theory	4
AP E 704	Transformers/Code Calculations/Conduit	4
AP E 705	Electronic/Industrial Blueprints	4
AP E 706	Grounding/Electrical Services/Connection	4
AP E 707	Motor Control/Pilot Devices/Starters	4
AP E 708	Digital Electronics	4
AP E 709	Mgmt/Alarms/Testing/Wiring	4
AP E 710	Programmable Logic Controllers	4
AP WE 713	Electrician Work Experience	16
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
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
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
Review of the International Brotherhood of Electrical Workers constitution and local union by-laws. Study of the effects of inductance and capacitance on current and voltage. Application of phase angle calculation and the National Electric Code. Overview of workplace problems due to drug abuse.

AP E 704 Transformers and Code Calculations, Conduit Bending and Blueprints (4)
3 hours lecture - 3 hours laboratory
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
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
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
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
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 E 709 Management, Fire Alarms, High Voltage Testing, and Telephone and Security Wiring (4)
3 hours lecture - 3 hours laboratory
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
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.
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		Units
AP IW 701	Introduction to the Electrical Trade	4
AP IW 702	Electrical Theory, Practice and Blueprint Reading	4
AP IW 703	Inductance and Capacitance Theory	4
AP IW 704	Transformer, Motors, and Motor Controls	4
AP IW 705	Special Electrical Systems	4
AP IW 706	Specialized Electrical Applications	4
AP WE 713	Electrician Work Experience	16
Electives (Select 16 units)		
AP IW 713	Electrical Project Supervision	4
AP IW 714	Electrical Certification Preparation	4
AP IW 716	Photovoltaics	4
AP IW 725	Building Automation Systems	4
AP IW 726	Electrical Construction Practices	4
AP IW 797	Inside Wireman Topics	2 - 4
TOTAL UNITS		**56**

COURSE OFFERINGS

AP IW 701 Introduction to the Electrical Trade (4)
3 hours lecture - 3 hours laboratory
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
Survey of drug awareness, Union Constitution and Bylaws, parliamentary procedure, 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
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
Study of real-world application of transformer, motor and motor control concepts utilizing extensive hands-on labs and demonstrations. Students work in foremenled 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
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
Introduction to electrical power quality, CATV and CCTV Systems, security systems, fiber optics, hazardous locations, lighting 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
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
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
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
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 Hybrid Electric Vehicle (PHEV) infrastructure.

AP IW 726 Electrical Construction Practices (4)
3 hours lecture - 3 hours laboratory
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 Screed 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 701/ 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 702/ 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 703/ 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
This course is designed to provide instruction and practice in advanced geometric lay out 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 system designed to prevent the passage of fire, smoke and hot gasses from one side of a rated wall/ceiling assembly to another.

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 797 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.
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		Units
AP SM 701	Core I	4
AP SM 702	Core II	4
AP SM 703	Core III	4
AP SM 704	Core IV	4
AP SM 705	Sheet Metal Welding	3
AP SM 706	Plans & Specifications	4
AP SM 709	Foreman and Project Management Training	4
AP SM 710	Architectural Application	4
AP SM 711	HVAC I	4
AP SM 712	HVAC II	4
AP WE 710	Sheet Metal Work Experience	16
TOTAL UNITS		**55**

COURSE OFFERINGS

AP SM 701 Core I (4)
3 hours lecture - 3 hours laboratory
An introduction to the basic principles, processes, drawings, materials and practices used in the sheet metal industry.

AP SM 702 Core II (4)
3 hours lecture - 3 hours laboratory
A continuation of basic sheet metal processes as well as an introduction to simple sheet metal forming processes.

AP SM 703 Core III (4)
3 hours lecture - 3 hours laboratory
An introduction to intermediate sheet metal processes demonstrating job layout, architectural details and construction techniques with problems of unusual complexity and difficulty.

AP SM 704 Core IV (4)
3 hours lecture - 3 hours laboratory
A continuation of intermediate processes with problems of unusual difficulty and complexity.

AP SM 705 Sheet Metal Welding (3)
1½ hours lecture - 4½ hours laboratory
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
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 hours lecture - 3 hours laboratory
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
Overview of the knowledge, skills, and abilities of advanced architectural project performance.

AP SM 711 HVAC I (4)
3 hours lecture - 3 hours laboratory
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
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.
Topics 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 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	Intro to Digital Electronics and Signaling Devices	4
AP SC 706	Management/Alarms/Codes/Circuits	4
AP WE 713	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
Introduction to the sound and communication industry, electrical code, fundamentals of wiring methods, fastening devices, electrical conductors, circuits, voltage and data communication.

See Catalog addendum at http://www.palomar.edu/catalog

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 inductance, 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
Study of solid-state electronic theory and components, diodes, transistors, SCR, triacs, diacs, IC amplifiers and op-amps.

AP SC 705 Introduction to Digital Electronics and Signaling Devices (4)
3 hours lecture - 3 hours laboratory
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
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 707 Life Safety and Security System Applications (4)
3 hours lecture - 3 hours laboratory
Continuation of digital theory studies. Instruction expands coverage of Life Safety Systems, and introduces the theory and application of Nurse Call Systems and Security Systems with an emphasis on closed circuit television (CCTV) installations.

AP SC 708 Specialized Systems and Supervision Techniques (4)
3 hours lecture - 3 hours laboratory
Study of specialized building systems including cable television systems (CATV), master antenna systems (MATV), and building automation systems. Training will cover aspects of job administration including personal computer use, job estimating, customer relations, and building system startup procedures.

AP SC 797 Sound and Communication Systems Installer 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.
Topics in Sound and Communication Systems Installer. See Class Schedule for specific topic covered. Course title will designate subject covered.

Work Experience (AP WE)

Students may earn a maximum of 16 units in AP Work Experience.

AP WE 710 Sheet Metal Work Experience (4)
12 hours laboratory
Note: *Pass/No Pass grading only*
Supervised on-the-job training in the Sheet Metal Trade.

AP WE 711 Carpentry Work Experience (4)
12 hours laboratory
Note: *Pass/No Pass grading only*
Supervised on-the-job training in the Carpentry trade.

AP WE 712 Drywall/Acoustical Work Experience (4)
12 hours laboratory
Note: *Pass/No Pass grading only*
Supervised on-the-job training in the Interior Systems Trade.

AP WE 713 Electrician Work Experience (4)
12 hours laboratory
Note: *Pass/No Pass grading only*
Supervised on-the-job training in the Electrician 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.*
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.*
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 101or 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.