

AP C 772 Solar Installer Level I (1.5)
 1 hour lecture - 1 1/2 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 - 1 1/2 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 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.
Prerequisite: Indentured apprentice to the Carpenters Joint Apprenticeship and Training Committee for Southern California
 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 723 Advanced Lathing	1.5
AP DL 724 Ceiling and Soffit Finishing	1.5
AP DL 725 Wet Wall Finishes	1.5

AP DL 726 Reinforced Substrate Installations	1.5
AP DL 727 Decorative Trims and Textures	1.5
AP DL 728 Drywall Applications	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 - 1 1/2 hours laboratory
Prerequisite: Indentured apprentice to a designated Joint Apprenticeship and Training Committee

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 - 1 1/2 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 - 1 1/2 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 - 1 1/2 hours laboratory
Prerequisite: A minimum grade of 'C' in AP DL/AP 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 (1.5)
 1 hour lecture - 1 1/2 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 - 1 1/2 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 - 1 1/2 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 - 1 1/2 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 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 723 Advanced Lathing (1.5)**
1 hour lecture - 1½ hours laboratory
 This course will distinguish advance lathing methods and styles from basic application techniques for lath and trim products used on exterior-interior metal framing. Metal framing elements, various bead styles, lathing types and substrates will be covered in both discussions and lab activities. Proper leveling and finishing methods will be demonstrated. Students will apply lath and trim using the techniques presented to complete course projects.
- 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 725 Wet Wall Finishes (1.5)**
1 hour lecture - 1½ hours laboratory
 Presents the industry use, application methods, and product mediums typically used for wet wall finishes. The techniques and procedures used to achieve a level five finish to industry standards requires base and top coating of interior surfaces for inspection purposes. Selection and use of painting equipment and coatings will be included in the training.
- AP DL 726 Reinforced Substrate Installations (1.5)**
1 hour lecture - 1½ hours laboratory
 Presents the applications techniques and product considerations typical of reinforced substrate installations. The training will focus on Glass Fiber Reinforced Gypsum and Glass Fiber Reinforced Concrete (GFRG) & (GFRC) products. The lab project will include layout, cutting and handling practices, attachment methods, alignment and various related installation methods.
- AP DL 727 Decorative Trims and Textures (1.5)**
1 hour lecture - 1½ hours laboratory
 Provides advanced hand and automatic tool finishing techniques used in the application of decorative trims and special surface textures. Training includes product information for metal, paper, plastics and art beads. Special attention will be given to coating and sanding sequence of field and butt joints for selected surface textures.
- AP DL 728 Drywall Applications (1.5)**
1 hour lecture - 1½ hours laboratory
 Focus on the skills to properly handle and install drywall used in specialized applications including fire resistance, sound control, and life safety. Layout, cutting, attachment procedures and productivity techniques will be discussed and practiced under jobsite conditions. Drywall finishing methods will be incorporated into the hands-on activity.
- 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	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
APWE 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

Prerequisite: Completion of the following: (1) One semester of Algebra I 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

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

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 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

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.