AP IW 115 Low Voltage (4)
3 hours lecture-3 hours laboratory
Prerequisite: A minimum grade of 'C' in AP IW 106
Note: May be taken 2 times
Study of technologies and installation requirements for low voltage systems. Subjects presented in this course are Low Voltage Design and Specification Techniques, Fiber Optics, LAN Cabling Systems, IEEE Grounding Requirements for Electronic Equipment, Power Quality to Support Low Voltage Systems, Telephone Systems, Nurse Call, and CCTV.

AP IW 116 Photovoltaics (4)
3 hours lecture-3 hours laboratory
Prerequisite: A minimum grade of 'C' in AP IW 106
Note: May be taken 2 times
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 117 Service Equipment (2)
1½ hours lecture-1½ hours laboratory
Prerequisite: A minimum grade of 'C' in AP IW 106
Note: May be taken 2 times
Presentation of the technologies and skill sets required for installing and provisioning an electrical service for commercial or industrial facilities. Topics presented in this course include electrical distribution overview, safety, OSHA requirements, shoring, trenching, Sempra Service Guide requirements, rigging, IEEE Standards, and National Electrical requirements (Article 230) for an electrical service.

AP IW 118 Test Equipment (2)
1½ hours lecture-1½ hours laboratory
Prerequisite: A minimum grade of 'C' in AP IW 106
Note: May be taken 2 times
The technologies and skill sets required for testing and troubleshooting electrical distribution systems and associated hardware including electric motors and drives. The topics presented in this course include testing procedures, test equipment, testing documentation, lighting and branch circuit analysis and troubleshooting.

AP IW 119 Welding (2)
1½ hours lecture-1½ hours laboratory
Prerequisite: A minimum grade of 'C' in AP IW 106
Note: May be taken 2 times
Basic understanding of cutting torch and electrical resistance welding principles and techniques. Covers safe storage, transportation, and use of acetylene, oxygen, and chemelene (MAPP) gases for cutting, as well as "stick" and wire-feed welding safety and technique. Upon completion of the course students will be able to weld in vertical, overhead and horizontal positions.

AP IW 120 Instructional Leadership I (4)
3 hours lecture-3 hours laboratory
Prerequisite: A minimum grade of 'C' in AP IW 106
Note: May be taken 2 times
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.

AP IW 121 Programmable Logic Controllers (4)
3 hours lecture-3 hours laboratory
Prerequisite: A minimum grade of 'C' in AP IW 106 and a minimum grade of 'C' in AP IW 109 and a minimum grade of 'C' in AP IW 112
Note: May be taken 2 times
Provides an in-depth study of programmable logic controllers (PLC) while examining standard programming languages and common PLC hardware applications. This course focuses on the underlying principles of PLCs and provides practical information on installing, programming, maintaining, and troubleshooting PLCs.

AP IW 122 Fire/Life Safety Systems (4)
3 hours lecture-3 hours laboratory
Prerequisite: A minimum grade of 'C' in AP IW 106
Note: May be taken 2 times
This course is designed to introduce students to the code requirements, design concepts, and installation techniques required for an efficiently installed and properly working fire alarm system. This course includes an overview of NFPA 70 (NEC) – 2002 edition as it applies to Fire Alarm, an introduction to NFPA 72 – 1999 edition National Fire Alarm Code with overview of Chapters 1 through 9, including Appendix A.

AP IW 123 Instrumentation (4)
3 hours lecture-3 hours laboratory
Prerequisite: A minimum grade of 'C' in AP IW 106
Note: May be taken 2 times
This class provides students with a more advanced understanding of instrumentation and control, covering temperature, pressure, flow, and level detection (process control) systems; their principles of operation, and strategies for installation, maintenance, and troubleshooting of these systems.

AP IW 124 Instructional Leadership II (4)
3 hours lecture-3 hours laboratory
Prerequisite: AP IW 106
Note: May be taken 2 times
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.

AP IW 197 Inside Wireman Topics (.5-4)
Units awarded in topics courses are dependent upon the number of hours required of the student. Any combination of lecture, laboratory, or lecture/laboratory may be scheduled by the department. Refer to Class Schedule.
Note: May be taken 4 times
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.A. DEGREE MAJOR OR CERTIFICATE OF ACHIEVEMENT

Program Requirements		Units
AP DL/AP PL/ AP AC 201	Orientation	1.5
AP DL/AP PL/ AP AC 202	Safety and Health Certifications	1.5
AP DL/AP PL/ AP AC 203	Printreading	1.5
AP DL/AP PL/ AP AC 204	Advanced Printreading	1.5
AP DL/ AP PL 205	Basic Lathing	1.5
AP PL 206	Basic Plastering	1.5
AP PL 207	Exterior Plastering	1.5
AP PL 208	DOT and Screed Techniques	1.5
AP PL 209	Interior Plastering	1.5
AP PL 210	Finish Applications	1.5
AP PL 211	Ornamental Plastering	1.5
AP PL 212	Plastering Replications	1.5
AP PL 213	Theme Plastering	1.5
AP PL 214	Architectural Wall Finishing	1.5

AP DL/ AP PL 215	Exterior Insulation Finish Systems	1.5
AP DL/ AP PL 216	Firestopping Procedures	1.5
AP WE 112	Drywall/Acoustical Work Experience	16
TOTAL UNITS		**40**

COURSE OFFERINGS

AP PL 197 Plasterer Topics (.5–4)
Units awarded in topics courses are dependent upon the number of hours required of the student. Any combination of lecture, laboratory, or lecture/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
Note: May be taken 4 times
Topics in Plasterer. See Class Schedule for specific topic offered. Course title will designate subject covered.

AP PL 201 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 201/ AP AC 201; may be taken 2 times
Introduction to the Interior Systems program. Content includes safe and proper usage of hand tools, power/powder tools, an introduction to trade related math, beginning blueprint reading and layout. Certifications will include Ramset/Red Head or Hilti low velocity power/powder actuated tools and scaffold erector/dismantler (welded frame).

AP PL 202 Safety and Health Certifications (1.5)
1 hour lecture-1½ hours laboratory
Note: Cross listed as AP DL 202/ AP AC 202; may be taken 2 times
Designed to incorporate learning theories, methods and techniques that meet the needs of the Interior Systems industry. Content includes certification in forklift, aerial lift, American Red Cross, First Aid/CPR and OSHA 10.

AP PL 203 Printreading (1.5)
1 hour lecture-1½ hours laboratory
Note: Cross listed as AP DL 203/ AP AC 203; may be taken 2 times
This course is designed to teach the basics of reading, understanding and visualizing the blueprints. Terms, symbols and definitions from several trades will be incorporated. Prints showing both residential and commercial application will be used. Related safety, math and blueprint reading will be covered.

AP PL 204 Advanced Printreading (1.5)
1 hour lecture-1½ hours laboratory
Prerequisite: A minimum grade of 'C' in AP PL/AP AC 203
Note: Cross listed as AP DL 204/ AP AC 204; may be taken 2 times
This course will give the student more in depth training related to on the job conditions. Basic estimating, material take offs and organizing jobs will be included.

AP PL 205 Basic Lathing (1.5)
1 hour lecture-1½ hours laboratory
Note: Cross listed as AP DL 205; may be taken 2 times
This course will cover the different styles and techniques of structural framing compared to light gage framing. Proper waterproofing, lath or drywall and trim will be explained, demonstrated and applied to the framing. Related safety, math and blueprint reading will be covered.

AP PL 206 Basic Plastering (1.5)
1 hour lecture-1½ hours laboratory
Note: May be taken 2 times
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 207 Exterior Plastering (1.5)
1 hour lecture-1½ hours laboratory
Note: May be taken 2 times
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 208 DOT and Screed Techniques (1.5)
1 hour lecture-1½ hours laboratory
Note: May be taken 2 times
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 209 Interior Plastering (1.5)
1 hour lecture-1½ hours laboratory
Note: May be taken 2 times
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 210 Finish Applications (1.5)
1 hour lecture-1½ hours laboratory
Note: May be taken 2 times
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 211 Ornamental Plastering (1.5)
1 hour lecture-1½ hours laboratory
Prerequisite: AP PL 210
Note: May be taken 2 times
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 212 Plastering Replications (1.5)
1 hour lecture-1½ hours laboratory
Note: May be taken 2 times
This course is an introduction to three types of brick used in plastering. Attention given to the techniques used to achieve a finished job that looks like the real material it is replacing. Students will also learn masonry terms and study architectural details related to masonry.

AP PL 213 Theme Plastering (1.5)
1 hour lecture-1½ hours laboratory
Note: May be taken 2 times
This course is designed to teach the student the basic knowledge and skills required to successfully plan and execute a simple project that requires the use of manufactured rock. A study of real rock formations and the techniques used to copy them will be covered as well as painting and highlighting, required tools, art lay out, and carving techniques.

AP PL 214 Architectural Wall Finishing (1.5)
1 hour lecture-1½ hours laboratory
Note: May be taken 2 times
This course is designed to introduce the sophisticated design elements of architectural wall finishing. Walls as an art form with transitioning color and texture are becoming increasingly popular and are in high demand.

AP PL 215 Exterior Insulation Finish Systems (1.5)
1 hour lecture-1½ hours laboratory
Note: Cross listed as AP DL 215; may be taken 2 times
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 216 Firestopping Procedures (1.5)
1 hour lecture-1½ hours laboratory
Note: Cross listed as AP DL 216; may be taken 2 times
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.

Residential Wireman (AP RW)

A three-year apprenticeship program. Applicants for San Diego/Imperial counties should apply to the San Diego Electrical Training Trust, 4675 Viewridge Avenue, Suite D, San Diego, CA 92123. Telephone: (858) 569-6633, ext. 111.

A.A. DEGREE MAJOR OR CERTIFICATE OF ACHIEVEMENT

Program Requirements		Units
AP RW 101	Introduction to Residential Wiring Concepts	4
AP RW 102	Electrical Theory, Practice & Blueprint Reading	4
AP RW 103	AC/DC Electrical Theory and Applications	4
AP RW 104	Residential Certification Preparation	4
AP RW 105	Home Technology Integrator I	4
AP RW 106	Home Technology Integrator II	4
AP WE 113	Electrician Work Experience	16
TOTAL UNITS		**40**

COURSE OFFERINGS

AP RW 101 Introduction to Residential Wiring Concepts (4)
3 hours lecture-3 hours laboratory
Prerequisite: Indentured apprentice to a designated Joint Apprenticeship and Training Committee
Note: May be taken 2 times
Introduction to the electrical industry, with emphasis on jobsite safety, basic residential wiring, National Electric Code (NEC), sexual harassment, introduction to blueprints, tools and their use.

AP RW 102 Electrical Theory, Practice & Blueprint Reading (4)
3 hours lecture-3 hours laboratory
Prerequisite: A minimum grade of 'C' in AP RW 101
Note: May be taken 2 times
Survey of drug awareness, Union Constitution and Bylaws, parliamentary procedure, test instruments, National Electric Code (NEC), blueprint analysis, specialty residential wiring systems including telephone, LAN, security, fire alarm and CATV systems.

AP RW 103 AC/DC Electrical Theory and Applications (4)
3 hours lecture-3 hours laboratory
Prerequisite: A minimum grade of 'C' in AP RW 102
Note: May be taken 2 times
Introduction to the electrical industry, with emphasis on jobsite safety, AC and DC theory, National Electric Code (NEC), electric motors, transforms, relays, motor controls, tools and their use. Particular attention will be given to residential lighting, wiring devices, appliance cords/connections, and residential branch circuit wiring.

AP RW 104 Residential Certification Preparation (4)
3 hours lecture-3 hours laboratory
Prerequisite: A minimum grade of 'C' in AP RW 103
Note: May be taken 2 times
This course is designed to prepare the student to take the California Electrician Certification Examination (CECE). The class 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 RW 105 Home Technology Integrator I (4)
3 hours lecture-3 hours laboratory
Prerequisite: A minimum grade of 'C' in AP RW 104
Note: May be taken 2 times
Provides the student with the background necessary to install, troubleshoot, and maintain computer networks, video theater systems, voice networks, CATV networks, and other specialized audio/video systems designed for the home environment.

AP RW 106 Home Technology Integrator II (4)
3 hours lecture-3 hours laboratory
Prerequisite: A minimum grade of 'C' in AP RW 105
Note: May be taken 2 times
Provides the essential networking concepts to permit design and engineering of a residential network and its components. Provides information on home network installations that includes lighting control systems; telecommunication devices; security, access control, home automation controllers; heating, ventilation, and air conditioning control systems; and integration of each. Upon completion of this course students will be prepared to take two CompTIA HTI+ certification exams: Residential Systems and Systems Infrastructure and Integration.

AP RW 197 Residential Wireman Topics (.5–4)
Units awarded in topics courses are dependent upon the number of hours required of the student. Any combination of lecture, laboratory, or lecture/laboratory may be scheduled by the department. Refer to Class Schedule.
Note: May be taken 4 times
Topics in Residential Wireman. See Class Schedule for the 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.A. DEGREE MAJOR OR CERTIFICATE OF ACHIEVEMENT

Program Requirements		Units
AP SM 101	Core I	4
AP SM 102	Core II	4
AP SM 103	Core III	4
AP SM 104	Core IV	4
AP SM 105	Sheet Metal Welding	3
AP SM 106	Plans & Specifications	4
AP SM 107	Construction Plan Problem Solving	4
AP SM 108	Introduction to Basic Refrigeration	4
AP SM 109	Foreman and Project Management Training	4
AP SM 110	Architectural Problem Solving	4
AP WE 110	Sheet Metal Work Experience	16
TOTAL UNITS		**55**

COURSE OFFERINGS

AP SM 101 Core I (4)
3 hours lecture-3 hours laboratory
Prerequisite: Indentured apprentice to the San Diego Sheet Metal Joint Apprenticeship and Training Committee
Note: May be taken 2 times
An introduction to the basic principles, processes, drawings, materials and practices used in the sheet metal industry.