

Connecticut Technical Education and Career System

Connecticut-SDE

Electrical Apprenticeship
Information Packet

State of
Connecticut
Electrical
Apprenticeship
Information
Packet 18-19



Connecticut Technical Education & Career System
Connecticut State Department of Education

Electrical
APPRENTICESHIP
INFORMATION PACKET

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2018-19

Covering the following licenses:

E-2 Electrician
L-6 Low Voltage
T-2 Telephone Interconnect
C-6 Telephone Interconnect/Low Voltage
PV-2 Limited Solar Electric Journeyman

Concerning related classroom instruction, each apprentice student is expected:

- To purchase the textbooks required for each course
- To complete all instructor assigned quizzes and exams as well as any academic reinforcement activities.

Student Responsibility Enrollment and Attendance:

- Students are held responsible for making informed enrollment decisions and for knowledge of and compliance with CTHSS policies and procedures, current printed class schedule as well as special registration instructions which may be issued on a semester-by-semester basis.

ATTENDANCE:

Based on 3 hour class sessions, the following is a list of total hours in a course and the maximum number of allowed absences (by number of classes) prior to denial of credit:

<u>Total hours in classes</u>	<u>Maximum absences</u>	<u>Total hours in classes</u>	<u>Maximum absences</u>
1 - 9	0	61 - 90	3
10 - 30	1	91 - 120	4
31 - 60	2		

Excessive tardiness and/or early departures will be addressed on an individual basis and may cause denial of credit; example being marked tardy for 3- 1 hour incidents will equate to an absence.

Employers have the right to verify their employee's attendance in a program.

NOTE: A minimum grade of 75% is necessary to pass each course.

All trade area content is based on a strong mathematical foundation. For this reason the baseline for transfer credit needs to be set to a higher standard, as well as being recent. Basic Math transfer credit may be awarded with a minimum of an '85' average completed in a comparable course, and taken within the last five years from date request for credit is submitted. All communications will need to be forwarded through the apprentice school supervisor at the local school. For perusal of waiver, please provide the apprentice school supervisor with the following:

- Transcripts detailing grades earned in the course, showing a minimum proficiency level of an '85' or better.
- Course description from institution listed on transcripts.

Electrical Algebra w/Trig requirements

Electrical Algebra w/Trig Requirements Course substitution: Academic transcripts showing successful completion of an academic Algebra course **cannot** be substituted for the required thirty-six hour ***Electrical Algebra w/Trig*** requirements (A0005) course. Please be advised this is **not permissible**, as just holding a high school/college transcript or report card is not an allowable substitution for this course.

The following section, Apprentice Responsibilities, is taken from the **State of Connecticut-Apprentice Handbook & Progress Report**, which is given to each apprentice at the beginning of their training by the Office of Apprenticeship Training, Connecticut State Labor Department.

Apprentice Responsibilities:

1. Work safely.
2. Avoid absenteeism and tardiness at work and at school.
3. Attend and participate in related instruction and maintain the highest possible grades.
4. Be involved and show dedication to your training (both on the job and in the classroom).
5. Keep track of your training hours, (either in the form of work records or logbook) and advise your supervisor of any deficiencies in your apprenticeship training.
6. Show dedication and interest in learning the trade.
7. Show respect to the skilled journeypersons training and supervising you.
8. Comply with the provisions of the Apprentice Agreement.
9. Follow your sponsor's written work rules and policies.
10. You must be accompanied by a journeyperson while on the job site.

Regional Apprenticeship Representatives
Office of Apprenticeship Training
Department of Labor
860-263-6085

Contact information and region assigned:

Region 1: Paul Femia, paul.femia@ct.gov (860) 263-6128

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Region 2: Larry Satchell, larry.satchell@ct.gov (860) 263-6084

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Region 3: Owen Golding, owen.golding@ct.gov (860) 263-6083

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Region 4: Gina Knox, gina.knox@ct.gov (860) 263-6277

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Region 5: Tammie Whiting, tammie.whiting@ct.gov (860)263-6154

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Region 6: Isaiah Curtis, Isaiah.curtis@ct.gov (860) 263-6042

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Statewide: Keri Lamontagne, keri.lamontagne@ct.gov (860) 263-6129

Towns Served:

Statewide	Manufacturing
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Towns and Cities by Regional DOL Rep located on the following page:

REGION 1 PAUL FEMIA 860-263-6128	REGION 2 LARRY SATCHELL 860-263-6084	REGION 3 OWEN GOLDING 860-263-6083	REGION 4 GINA KNOX 860-263-6277	REGION 6 ISAIAH CURTIS 860-263-6042	REGION 5 TAMMIE WHITING 860-263-6154
Berlin	Andover	Avon	Ansonia	Ashford	Beacon Falls
Chester	Bolton	Barkhamsted	Bethel	Bozrah	Bethany
Clinton	Columbia	Bethlehem	Bridgeport	Brooklyn	Branford
Colchester	Coventry	Bloomfield	Darien	Canterbury	Cheshire
Cromwell	East Hartford	Bridgewater	Derby	Chaplin	East Haven
Deep River	East Windsor	Bristol	Easton	Eastford	Hamden
Durham	Ellington	Brookfield	Fairfield	Franklin	Middlebury
East Haddam	Enfield	Burlington	Greenwich	Griswold	Naugatuck
East Hampton	Hartford	Canaan	Milford	Hampton	New Haven
East Lyme	Hebron	Canton	Monroe	Killingly	North Branford
Essex	Manchester	Colebrook	New Canaan	Lebanon	North Haven
Glastonbury	Mansfield	Comwall	Newtown	Ledyard	Orange
Greenwich	Rocky Hill	Danbury	Norwalk	Lisbon	Oxford
Groton	Somers	East Granby	Redding	Montville	Plainville
Gulford	South Windsor	Farmington	Ridgefield	Norwich	Prospect
Haddam	Stafford	Goshen	Shelton	Plainfield	Seymour
Killingworth	Suffield	Granby	Stamford	Pomfret	Southington
Lyme	Tolland	Hartland	Stratford	Putnam	Wallingford
Madison	Union	Harwinton	Trumbull	Scotland	Waterbury
Marlborough	Vernon	Kent	Weston	Sterling	West Haven
Meriden	Wethersfield	Litchfield	Westport	Thompson	Wolcott
Middlefield	Willington	Morris	Wilton	Woodstock	Woodbridge
Middletown	Windham	New Fairfield			
New Britain	Windsor	New Hartford			
New London	Windsor Locks	New Milford			
Newington		Norfolk			
North Stonington		North Canaan			
Old Lyme		Plymouth			
Old Saybrook		Roxbury			
Portland		Salisbury			
Preston		Sharon			
Salem		Sherman			
Sprague		Simsbury			
Stonington		Southbury			
Voluntown		Thomaston			
Waterford		Torrington			
Westbrook		Unionville			
		Warren			
		Washington			
		Watertown			
		West Hartford			
		Winchester			
		Woodbury			

Electrical Work Licenses: Licenses Expire annually: September 30th

Section 20-330 of the Connecticut General Statutes

"**Electrical work**" means the installation, erection, maintenance, alteration or repair of any wire, cable, conduit, busway, raceway, support, insulator, conductor, appliance, apparatus, fixture or equipment which generates, transforms, transmits or uses electrical energy for light, heat, power or other purposes.

E-1 Unlimited Electrical Contractor

The holder of this license may do all electrical work as defined in section 20-330 of the General Statutes.

E-2 Unlimited Electrical Journeyman

The holder of this license may do the same work as an E-1 licensee, but only while in the employ of a contractor licensed for such work.

L-5 Limited Electrical Contractor

The holder of this license may perform only work limited to ADT, similar or low voltage signal work, audio and sound systems. The installation or repair of any electrical work for plating or similar low voltage work is not authorized. The voltage of the system is not to exceed 25 volts or five amperes where such work commences at an outlet receptacle or connection previously installed by a person holding the proper electrical license.

L-6 Limited Electrical Journeyman

The holder of this license may perform the same work as the L-5 licensee, but only while in the employ of a contractor licensed for such work..

C-5 Limited Electrical Contractor

The holder of this license may perform only work limited to ADT, similar or low voltage signal work, audio and sound systems, and telephone-interconnect systems. The installation, repair, maintenance of any electrical work for plating is not authorized. The voltage of any system is not to exceed forty-eight (48) volts or five (5) amperes where such work commences at an outlet receptacle or connection previously installed by a person holding the proper electrical license.

C-6 Limited Electrical Journeyman

The holder of this license may perform the same work as the C-5 licensee, but only while in the employ of a contractor licensed for such work.

T-1 Limited Electrical Contractor

The holder of this license may perform only work limited to telephone-interconnect systems where such work commences at an outlet receptacle or connection previously installed by a person holding the proper electrical license.

T-2 Limited Electrical Journeyman

The holder of this license may perform the same work as the T-1 licensee, but only while in the employ of contractor licensed for such work.

PV-1 LIMITED SOLAR ELECTRIC CONTRACTOR*

The holder of this license may perform only work limited to Solar Electric systems; which means the installation, erection, repair, replacement, alteration or maintenance of photovoltaic or wind generation systems, including storage and distribution of such energy for heat, light, power or other purposes to a point immediately inside a structure or adjacent to an end use. The requirements to qualify for this license examination shall be two years as a solar journeyman or equivalent experience and training.

PV-2 LIMITED SOLAR ELECTRIC JOURNEYMAN*

The holder of this license may perform only work limited to Solar Electric systems; which means the installation, erection, repair, replacement, alteration or maintenance of photovoltaic or wind generation systems, including storage and distribution of such energy for heat, light, power or other purposes to a point immediately inside a structure or adjacent to an end use and only while in the employ of a licensed electrical contractor. The requirements to qualify for this license examination shall be the completion of a registered apprenticeship program or equivalent experience and training.

Connecticut State Department of Education
Connecticut Technical Education & Career System

Effective- January 1, 2002
E-2 ELECTRICAL APPRENTICESHIP
COURSE SEQUENCE AND PREREQUISITES

Related Instruction- 720 Hours

OJT - 8000 Hours

COURSES (EACH COURSE IS 36 HOURS)	Course number	Semester	Prerequisites
FIRST YEAR COURSES:			
Basic Math Computations	A0001	1	
Blueprint Reading	A0031	1	
Electrical Algebra w/Trig	A0005	2	A0001
Electrical Theory I	A0901	2	
OSHA-30	A0099	2	
SECOND YEAR COURSES:			
Electrical Code I	A0904	1	
Telecom Cabling	A0925	1	
Electrical Code II	A0905	2	A0904
Basic Telecommunications	A0924	2	
Electrical Theory II	A0902	2	A0901
THIRD YEAR COURSES:			
Electrical Code III	A0909	1	A0904, A0905, A0906
Motor Controls	A0906	1	
Basic Alarm Technology	A0927	2	
Semiconductors for Electricians	A0908	2	
Logic Circuits-Programmable Controllers, Part 1	A0914	2	A0906
FOURTH YEAR COURSES:			
Logic Circuits-Programmable Controllers, Part II	A0926	1	A0914
Motor and Generator Theory	A0907	1	
Fire, Access & CCTV Systems	A0928	2	
Electrical Code IV	A0910	2	A0904, A0905, A0909
Power Distribution and Load Calculations	A0917	2	

Connecticut Technical Education & Career System

Effective- January 1, 2002

T-2 Telephone Interconnect Electrical Apprenticeship

COURSE SEQUENCE AND PREREQUISITES

Related Instruction- 288 Hours

OJT-4000

Courses (EACH COURSE IS 36 HOURS)	Course Number	Semester	Prerequisites
Basic Math Computations	A0001	1	
Blueprint Reading	A0031	1	
Electrical Theory I	A0901	2	
OSHA-30	A0099	2	
Electrical Code I	A0904	1	
Basic Telecommunications	A0924	1	
Electrical Theory II	A0902	2	A0901
Telecom Cabling	A0925	2	

Effective- January 1, 2002

L-6 Low Voltage Electrical Apprenticeship

COURSE SEQUENCE AND PREREQUISITES

Related Instruction- 288 Hours

OJT-4000

Courses (EACH COURSE IS 36 HOURS))	Course Number	Semester	Prerequisites
Basic Math Computations	A0001	1	
Blueprint Reading	A0031	1	
Electrical Theory I	A0901	2	
OSHA-30	A0099	2	
Electrical Code I	A0904	1	
Basic Alarm Technology	A0927	1	
Electrical Theory II	A0902	2	A0901
Fire, Access & CCTV Systems	A0928	2	

C-6 Telephone Interconnect/Low Voltage Electrical Apprenticeship

COURSE SEQUENCE AND PREREQUISITES

Related Instruction- 360 Hours

OJT-4000

Courses (EACH COURSE IS 36 HOURS)	Course Number	Semester	Prerequisites
Basic Math Computations	A0001	1	
Blueprint Reading	A0031	1	
Electrical Theory I	A0901	1	
Electrical Code I	A0904	2	
OSHA-30	A0099	2	
Basic Alarm Technology	A0927	1	
Basic Telecommunications	A0924	1	
Fire, Access & CCTV Systems	A0928	2	
Electrical Theory II	A0902	2	A0901
Telecom Cabling	A0925	2	

Effective- July 10, 2009
Electrical Apprentice Curriculum
Related Instruction Credit Award

PV-2 ELECTRICAL APPRENTICESHIP
OJT-4000 Hours Related Instruction- 360 Hours

COURSES (EACH COURSE IS 36 HOURS)	Course number	Semester	Prerequisites
FIRST YEAR COURSES:			
Basic Math Computations	A0001	1	
Blueprint Reading	A0031	1	
Electrical Code I	A0904	2	
Building Trade Safety / OSHA-30 (eff. 9/1/13)	A0099	2	
Electrical Theory I	A0901	2	
SECOND YEAR COURSES:			
Electrical Code II	A0905	1	A0904
Electrical Theory II	A0902	1	
Electrical Code IV	A0910	2	A0904, A0905
Power Distribution and Load Calculations	A0917	2	

Course Outlines

NOTE: Each apprentice student is expected to complete all instructor assigned quizzes and exams as well as any academic reinforcement activities.

A minimum grade of 75% is necessary to pass each course.

E-2 Electrical Curriculum Related Instruction-720 Hours Table of Contents

Course: Basic Math Computations A0001 36 Hours

- A. Computations Using Real Numbers
- B. Computations Using Fractions
- C. Computations Using Decimal Fractions
- D. Base, Rate, and Portion
- E. Computation of Area and Volume
- F. Units of Measurements

Course: Blueprint Reading A0031 36 Hours

- A. Application of Building Codes and Standards
- B. Introduction to Blueprint Reading
- C. Alphabet of Lines and Symbols
- D. Orthographic Projection Drawings
- E. Construction Dimensions and Construction Materials
- F. Reading Plot Plans and Contour Maps
- G. Footings, Foundations and Floor Blueprint Structural Steel, Framing Blueprints
- H. Plumbing System Blueprints
- I. H.V.A.C. System Blueprints
- J. Electrical Systems Blueprints

Course: Electrical Algebra with Trigonometry A0005 36 Hours

Prerequisite: Basic Math Computations

- A. Power and Roots
- B. Groupings
- C. Addition, Subtraction, Multiplication and Division of Polynomials
- D. Solving Word Problems
- E. Identifying Triangles and Angles
- F. Pythagorean Theorem
- G. Trigonometric Functions, Sines, Cosines & Tangents
- H. Solution of Problems
- I. Ohm's Law Electrical Math
- J. Voltage Drop Calculations
- K. Single phase and three phase voltage drop
- L. Conductor sizing
- M. Inductance
- N. Capacitance
- O. Kirchhoff's Laws

Course: Electrical Theory I **A0901** **36 Hours**

- A. Introduction to Electricity and Matter
- B. Electricity Production and Use
- C. Electrostatics and Basic Circuit Concepts
- D. Scientific Notation and Metric Prefixes
- E. Electric Measurements
- F. Conductors, Resistance & Insulators
- G. OHM's Law, Electrical Power and Energy
- H. Series Circuit Calculations
- I. Parallel Circuit Calculations
- J. Series – Parallel Circuits

Course: OSHA-30 **A0099** **36 Hours**

- A. Introduction to OSHA – 2 hours
- B. Managing Safety and Health – 2 hours
- C. OSHA Focus Four Hazards – 6 hours
 - a. (1) Falls (minimum one hour and 15 minutes)
 - b. (2) Electrocution
 - c. (3) Struck-By (e.g., falling objects, trucks, cranes)
 - d. (4) Caught-In or Between (e.g., trench hazards, equipment)
- D. Personal Protective and Lifesaving Equipment – 2 hours
- E. Health Hazards in Construction – 2 hours
- F. Stairways and Ladders – 1 hour.
- G. Electives - 12 hours
 - a. Concrete and Masonry Construction
 - b. Confined Space Entry
 - c. Cranes, Derricks, Hoists, Elevators, & Conveyors
 - d. Ergonomics
 - e. Excavations
 - f. Fire Protection and Prevention
 - g. Materials Handling, Storage, Use and Disposal
 - h. Motor Vehicles, Mechanized Equipment and Marine Operations; Rollover Protective Structures and Overhead Protection; and Signs, Signals and Barricades
 - i. Powered Industrial Vehicles
 - j. Safety and Health Programs
 - k. Scaffolds
 - l. Steel Erection
 - m. Tools - Hand and Power
 - n. Welding and Cutting

Course: Electrical Code I **A0904** **36 Hours**

- A. Articles 80-225, 300-310 & Chapter 9

Course: Telecom Cabling **A0925** **36 Hours**

- A. Telephone Cable
- B. Connection Methods

- C. Distribution
- D. LAN Cabling
- E. Grounding
- F. Telecom Code

Course: Electrical Code II **A0905** **36 Hours**

Prerequisite: Code I

- A. Articles 230-427 & Chapter 9

Course: Basic Telecommunications **A0924** **36 Hours**

- A. Describing basic telephone terms and their usage
- B. Ohms Law and Circuits
- C. Dial Tone and Components of a Telephone
- D. LATAs Local Access Transport Area. Placing a Local Phone Call
- E. LD Network and Preferred Inter-exchange carrier. Placing a Long Distance Phone Call
- F. Understanding POTS Lines
- G. The Telecom Landscape – The Players
- H. The Telecom Landscape – The Customers
- I. Basic Voice Network Concepts
- J. Fundamentals of Transmission Systems
- K. Fundamentals of Data Communications
- L. Fundamentals of LANs
- M. ISDN BRI and PRI Lines
- N. Private Line Services
- O. Understanding Key Systems
- P. What is a PBX?
- Q. Voice Mail Integration with Key Systems and PBXs

Course: Electrical Theory II **A0902** **36 Hours**

Prerequisite: Electrical Theory I

- A. Introduction to Alternating Current
- B. Alternating-Current Circuits Containing Resistance and Inductance in Alternating – Current Circuits
- C. Series Circuits – Resistance and Impedance and Resolving Vectors
- D. Capacitors, dielectric of capacitors, elementary functions of each part. Capacitors connected in series and parallel. Also RC and RL time constants
- E. Capacitors in alternating current circuits. Capacitive reactance
- F. Series Circuits: Resistance, Inductive Reactance, and Capacitive Reactance
- G. AC parallel circuits with branches containing resistance, inductance and capacitance

Course: Electrical Code III **A0909** **36 Hours**

Prerequisite: Code I & II

- A. Articles 430 Motors – 490 Equipment over 600 volts

Course: Motor Controls **A0906** **36 Hours**

- A. Tools, Instruments and Safe Work Habits.

Course: Fire, Access & CCTV Systems **A0928** **36 Hours**

- A. Terms & Definitions: Describing Basic Fire Alarm Terms and their usage
- B. Basic Elements and CPU Features
- C. Signal Initiation and Types of Initiating Devices
- D. Notification Appliances and Extinguishing Systems
- E. System Design, Approvals, Authorities and Acceptance
- F. Testing and Maintenance
- G. Introduction to Access Control and Forms of Access Control
- H. Access Control Major Devices
- I. Access Control Controller, Software, Code Compliance and Wiring Standards
- J. Common Types of CCTV
- K. CCTV Basic Components
- L. CCTV Basic Technology

Course: Electrical Code IV **A0910** **36 Hours**

Prerequisite: Code I, II & III

- A. Hazardous Locations and Special Occupancies, Articles 500-516
- B. Health Care Facilities, Article 517
- C. Special Occupancies, Articles 518-555
- D. Special Equipment, Article 600-695
- E. Special Conditions, Article 700-780
- F. Communication Systems, Articles 800-830
- G. Tables & Annex
- H. Code Review

Course: Power Distribution and Load Calculations **A0917** **36 Hours**

- A. Voltage Drop and Wire Sizes
- B. Power Transformers
- C. Three-Phase Power
- D. Poly Phase Systems
- E. Special Transformer Connections and Harmonics
- F. Power Factor Correction
- G. Load Calculations – Small Commercial Building – Phase I
- H. Load Calculations – Small Commercial Building – Phase II

Required Booklist for Electrical Apprentice Students:

Following are the required textbooks that each student must purchase for each course.

****PLEASE NOTE:** The **current CT. adopted** National Electric Code must be brought to all Electrical Theory and Blueprint Reading Courses. ******

For Low Voltage C-6 License Apprentice Coursework,

- Telecommunications Distribution Methods Manual, 12th or 13th edition, BICSI, 8610 Hidden River Pkwy., Tampa, FL 33637, (813) 979-1991 or (800) 242-7405, www.bicsi.org.
- National Electrical Code or The National Electrical Code Handbook, 2014 or 2017 edition, National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169, (800) 344-3555, www.nfpa.org. 2013 Amendment to the CT State Building Code. <http://www.ct.gov/dcs/site>
- Live Sound Reinforcement-Bestseller Edition, (1st Edition, 2005), Scott Hunter Stark, www.cengage.com
- NFPA 72 - National Fire Alarm Code – 2013, National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169, (800) 344-3555, www.nfpa.org
- NFPA 720 - Standard for the Installation of Carbon Monoxide(CO) Detection and Warning Equipment – 2012, National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169, (800) 344-3555, www.nfpa.org
- Ugly's Electrical References, George V. Hart, 2011 or 2014, Jones and Bartlett, (800) 832-0034, www.uglys.net.
- CCTV: Networking and Digital Technology, Vlado Damjanovski, 2005, 2nd edition, Butterworth- Heinemann, (800) 545-2522, www.bh.com
- Data, Voice, and Video Cabling, 3rd Edition, 2009, The Fiber Optic Association, Jim Hayes and Paul Rosenberg, www.cengage.com.
- Code of Federal Regulations - 29 CFR Part 1926 (OSHA), with latest available amendments, U.S. Government Printing Office, (866) 512-1800 or https://www.osha.gov/pls/oshaweb/owastand.display_standard_group?p_toc_level=1&p_part_number=1926
- ANSI / NECA / BICSI 568-2006 Standard for Installing Commercial Building Telecommunication Cabling Product Code BICSI-568-STAND-2006 www.bicsi.org BICSI TEL: 800-242-7405, 8610 Hidden River Parkway, Tampa, FL 33637-1000 USA

For Low Voltage L-6 License Apprentice Coursework,

- National Electrical Code or The National Electrical Code Handbook, 2014 or 2017 edition, National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169, (800) 344-3555, www.nfpa.org.
- NFPA 72 - National Fire Alarm Code – 2013, National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169, (800) 344-3555, www.nfpa.org
- Live Sound Reinforcement-Bestseller Edition, (1st Edition, 2005), Scott Hunter Stark, www.cengage.com
- Ugly's Electrical References, George V. Hart, 2011 or 2014, Jones and Bartlett, (800) 832-0034, www.uglys.net.
- Dr Watts Shirt Pocket Electrical Guide, Mark N. Shapiro, Atlas Publishing (888) 226-7052, www.wmarketingonline.com
- Data, Voice, and Video Cabling, 3rd Edition, 2009, The Fiber Optic Association, Jim Hayes and Paul Rosenberg, www.cengage.com
- NTC Blue Book; Security System Design and Installation, 2009 Print, National Training Center, 4148 Mantle Avenue, North Las Vegas, NV, 89084, www.NationalTrainingCenter.net

For Telephone Interconnect T-2 License Apprentice Coursework,

- National Electrical Code or The National Electrical Code Handbook, 2014 or 2017 edition, National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169, (800) 344-3555, www.nfpa.org.
- CFR 47 PART 68—Connection of Terminal Equipment to the Telephone Network, 2002
- Telecommunications Wiring, Clyde N. Herrick, 3rd edition (December 15, 2000) Prentice Hall PTR.
- Ugly's Electrical References, George V. Hart, 2011 or 2014, Jones and Bartlett, (800) 832-0034, www.uglys.net
- Telecommunications Cabling Installation, 2003, 2nd edition, McGraw Hill Professional, (877) 833-5524, www.mhprofessional.com.
- ANSI/NECA/BICSI 568-2006, Standard for Installing Commercial Building Telecommunications Cabling BICSI, 8610 Hidden River Parkway, Tampa, FL 33637-1000, Phone: 800.242.7405 Email: customerservice@bicsi.org, <https://www.bicsi.org>
- Telecommunications Distribution Methods Manual, 13th edition, BICSI, 8610 Hidden River Pkwy., Tampa, FL 33637, (813) 979-1991 or (800) 242-7405, www.bicsi.org.

For Solar Photovoltaic PV-2 License Apprentice Coursework,

- National Electrical Code or The National Electrical Code Handbook, 2014 or 2017 edition, National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169, (800) 344-3555, www.nfpa.org
- Code of Federal Regulations - 29 CFR Part 1926 (OSHA), with latest available amendments, U.S. Government Printing Office, (866) 512-1800 or <http://www.access.gpo.gov/nara/cfr/cfr-tablesearch.html#page1>
- Ugly's Electrical References, George V. Hart, 2011 or 2014, Jones and Bartlett, (800) 832-0034, www.uglys.net. All items are based on either the current last two editions.
- Practical Photovoltaics, Electricity from Solar Cells, 2002, Richard J. Komp, Ph.D. AATEC Publications, P.O.Box 7119, Ann Arbor, MI 48107 (800) 995-1470.
- The Easy Guide to Solar Electric Part II Installation Manual, 2001, Adi Pieper, Adi Solar 209 Arroyo Salado, Santa Fe, NM 87508 www.adisolar.com
- Photovoltaic Systems, 3rd edition, 2011, James Dunlap, American Technical Publishers, Orland Park, IL 60467-5756, www.atplearning.com
- Convert Your Home to Solar Energy by Everett M Barber, Jr., Joseph R Provey. Taunton Press, Incorporated. December 07, 2010

For Unlimited Electrical Apprenticeship Coursework, E-2

- National Electrical Code or The National Electrical Code Handbook, 2014 or 2017 edition, National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169, (800) 344-3555, www.nfpa.org
- Code of Federal Regulations - 29 CFR Part 1926 (OSHA), with latest available amendments, U.S. Government Printing Office, (866) 512-1800 or <http://www.access.gpo.gov/nara/cfr/cfr-table-search.html#page1>
- Ugly's Electrical References, George V. Hart, 2011 or 2014, Jones and Bartlett, (800) 832-0034, www.uglys.net. All items are based on either the current last two editions.
- NFPA 72 - National Fire Alarm Code – 2013, National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169, (800) 344-3555, www.nfpa.org
- Photovoltaic Systems, 3rd edition, James Dunlap, American Technical Publishers, Orland Park, IL 60467-5756, www.atplearning.com
- Convert Your Home to Solar Energy by Everett M Barber, Jr., Joseph R Provey. Taunton Press, Incorporated. December 07, 2010
- National Electrical Safety Code, 2012 Edition, Institute of Electrical Electronics Engineers, Inc., 800-699-9277, <http://www.techstreet.com/ieee/>

APPRENTICE PROGRAM
BOOK PUBLISHERS PHONE ORDER NUMBERS & WEBSITES

<u>Book Publishers</u>	<u>Phone Numbers</u>	<u>Website</u>
Goodheart-Willcox	1-800-323-0440	www.goodheartwillcox.com
Thomson Delmar Learning	1-800-347-7707	www.delmarlearning.com
National Fire Protection Association (NFPA)	1-800-344-3555	www.nfpa.org/index.asp
American Technical Publishers	1-800-323-3471	www.go2atp.com
International Code Council (ICC)	1-800-786-4452	http://shop.iccsafe.org/
CRC Press	1-800-272-7737	https://www.crcpress.com/
Amazon Bookstore	1-800-201-7575	www.amazon.com
BICSI	1-813-979-1991	www.bicsi.org/
Prentice Hall	1-800-282-0693	http://vig.prenhall.com/catalog/