Electricity II

8534 36 weeks / 280 hours

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Course Description

Suggested Grade Level: 11 or 12
Prerequisites: 8533

Students will continue to develop skills in the installation, operation, maintenance, and repair of residential, commercial, and industrial electrical systems. Students will also study electrical theory and mathematical problems related to electricity, apply requirements of the National Electrical Code (NEC) Book, select and install conductors, examine lighting, communication, and power systems, and work with conduit and raceways, panelboards, switchboards, grounding systems, and generators.

As noted in Superintendent's Memo #058-17 (2-28-2017), this Career and Technical Education (CTE) course must maintain a maximum pupil-to-teacher ratio of 20 students to one teacher, due to safety regulations. The 2016-2018 biennial budget waiver of the teacher-to-pupil ratio staffing requirement does not apply.

Task Essentials List

- Tasks/competencies designated by plus icons (⊕) in the left-hand column(s) are essential
- Tasks/competencies designated by empty-circle icons (○) are optional
- Tasks/competencies designated by minus icons (⊖) are omitted
- Tasks marked with an asterisk (*) are sensitive.

Task Number	8534	Tasks/Competencies
Applying Basic Construction Safety Standards (Core Safety)		
39	⊕	Comply with federal, state, and local safety legal requirements.
40	⊕	Maintain a safe working environment.
41	⊕	Explain safe working practices around electrical hazards.
42	⊕	Inspect course-specific hand and power tools to visually identify defects.
43	⊕	Report injuries.
44	⊕	Report personal, environmental, and equipment safety violations to the appropriate authority.
45	⊕	Pass safety exam.
Solving Mathematical Problems Related to the Electrical Field		
46	⊕	Solve problems using direct and inverse relationships.
47	⊕	Solve electrical problems using calculators.
48	⊕	Convert metric prefixes to their numerical equivalents and vice-versa.
Applying Basic Electrical Theory		
49	⊕	Troubleshoot series circuits.
50	⊕	Troubleshoot parallel circuits.
51	⊕	Wire series-parallel (combination) circuits.
52	⊕	Calculate series-parallel (combination) circuits.
53	⊕	Troubleshoot series-parallel (combination) circuits.
54	⊕	Explain nameplate specifications related to motors, generators, and transformers.
Applying the National Electrical Code (NEC) Book		
55	⊕	Apply the NEC requirements for electrical installation.
Identifying and Installing Conduit and Raceways		
56	⊕	Identify various conduits and raceways.
57	⊕	Select material and wiring support systems.
58	⊕	Install conduits.
Examining Lighting Systems		
59	⊕	Install fixtures.
60	⊕	Explain functions, operation, and characteristics of single-phase power systems.
61	⊕	Install power devices.
Exploring Panelboards and Switchboards		
62	⊕	Identify basic components of service entrance equipment.
63	⊕	Select OCPDs.
64	⊕	Install OCPDs.
65	⊕	Install various ground fault circuit interrupter (GFCI) and arc fault circuit interrupter (AFCI) devices.
Identifying and Installing Grounding Systems		
66	⊕	Identify characteristics of grounding systems.

Task Number	8534	Tasks/Competencies
67	⊕	Illustrate sizing, layout, and installation of grounding systems.
Installing Transformers		
68	○	Install transformers.

Legend: ⊕Essential ○Non-essential ⊖Omitted

Curriculum Framework

Applying Basic Construction Safety Standards (Core Safety)

Task Number 39

Comply with federal, state, and local safety legal requirements.

Definition

Compliance should include the identification of the Hazard Communication Standard, the information included on safety data sheets (SDS), and the responsibilities of employers and employees under HazCom.

Compliance should also include the Occupational Safety and Health Administration (OSHA), the Virginia Occupational Safety and Health Compliance Program (VOSH), and the Environmental Protection Agency (EPA).

Process/Skill Questions

- Where should hazardous materials be stored?
- What information can be found on an SDS?

NCCER Core Curriculum: Introductory Craft Skills, 2009

00101-09 Basic Safety

NCCER Electrical Standards, 2011

26102-11 Electrical Safety

Task Number 40

Maintain a safe working environment.

Definition

Maintenance should be ongoing and should include regular inspection of the work environment. Maintenance should result in identifying potential hazards on a job site or in the lab, such as unstable or improperly erected scaffolding, electrical hazards, job site debris, improperly stored materials, and air quality hazards. When present, hazards must be remedied by appropriate measures and comply with school and instructor's guidelines.

Process/Skill Questions

- What are some examples of job site hazards?
- Why is it important to use good housekeeping standards on a job site?
- Why is it important to store materials and tools in their proper places?

NCCER Core Curriculum: Introductory Craft Skills, 2009

00101-09 Basic Safety

NCCER Electrical Standards, 2011

26102-11 Electrical Safety

Task Number 41

Explain safe working practices around electrical hazards.

Definition

Explanation should include

- identifying equipment used to test electrical circuits
- describing safe working conditions
- demonstrating safe work habits

according to industry standards and instructor's guidelines.

Process/Skill Questions

- What is the definition of *proximity work*?
- What are safe working clearances according to the National Electric Code (NEC)?
- What are considered safe working conditions and safe working habits?
- What is the unseen hazard with electrical work?

NCCER Core Curriculum: Introductory Craft Skills, 2009

00101-09 Basic Safety

NCCER Electrical Standards, 2011

26102-11 Electrical Safety

Task Number 42

Inspect course-specific hand and power tools to visually identify defects.

Definition

Inspection of power tools should include

- identifying components of machinery (e.g., guards, blades, moving parts, start/stop switches)
- identifying standard safety procedures (i.e., lab practices and manufacturer's recommendations)
- observing a demonstration of the safe operation and use of each piece of machinery in lab.

Inspection of hand tools should include identification of tool defects.

Process/Skill Questions

- What are some of the basic power tools used in construction?
- What are the proper actions to take before using a power circular saw?
- Why should a power tool always be grounded?

NCCER Core Curriculum: Introductory Craft Skills, 2009

00101-09 Basic Safety

NCCER Electrical Standards, 2011

26102-11 Electrical Safety

Task Number 43

Report injuries.

Definition

Report should consist of an immediate oral statement of the job-related or non-job-related injury to the instructor or supervisor, and may be followed by a written confirmation reporting date, extent of injury, and circumstances of the accident.

Process/Skill Questions

- Why is it important to report injuries?
- What are common reporting procedures?
- Why is it important to report an injury promptly, before leaving the job site?
- What is workers' compensation?
- What are the key components of a report?

NCCER Core Curriculum: Introductory Craft Skills, 2009

00101-09 Basic Safety

NCCER Electrical Standards, 2011

26102-11 Electrical Safety

Task Number 44

Report personal, environmental, and equipment safety violations to the appropriate authority.

Definition

Report should include an oral or written statement identifying the violation and the date it was observed and should be given to the instructor, supervisor, or local OSHA inspector.

Process/Skill Questions

- What ethical considerations might be involved when reporting coworkers?
- Why is it important to follow reporting procedures?
- What is liability?

NCCER Core Curriculum: Introductory Craft Skills, 2009

00101-09 Basic Safety

NCCER Electrical Standards, 2011

26102-11 Electrical Safety

Task Number 45

Pass safety exam.

Definition

Assessment must measure participation in safety training programs, including attending safety meetings and completing periodic demonstration of knowledge and skills gained from program topics (e.g., interpretation of SDS).

Process/Skill Questions

- How often should one participate in safety training programs? Why?
- How does insurance impact the requirement for continuous retraining for safety?
- What is workers' compensation?

NCCER Core Curriculum: Introductory Craft Skills, 2009

00101-09 Basic Safety

NCCER Electrical Standards, 2011

26102-11 Electrical Safety

Solving Mathematical Problems Related to the Electrical Field

Task Number 46

Solve problems using direct and inverse relationships.

Definition

Calculate problems as assigned by instructor (i.e., step-up or step-down transformers).

Process/Skill Questions

- Why is it important for electricians to be able to convert fractions to decimals?
- Why is it important for electricians to understand word problems?

- How are fractions typically used in electrical work?

NCCER Electrical Standards, 2011

26103-11 Introduction to Electrical Circuits

26104-11 Electrical Theory

Task Number 47

Solve electrical problems using calculators.

Definition

Solutions to instructor-assigned problems should include the use of a calculator and should follow manufacturer's instructions.

Process/Skill Questions

- What types of problems can calculators solve?
- What are simple symbols on a calculator?
- What is the sine symbol on a calculator?

NCCER Electrical Standards, 2011

26103-11 Introduction to Electrical Circuits

26104-11 Electrical Theory

Task Number 48

Convert metric prefixes to their numerical equivalents and vice-versa.

Definition

Problems using common prefixes used in electricity (e.g., kilo, mega) must be solved in accordance with instructor’s guidelines.

Process/Skill Questions

- When metric prefixes are typically used in the electrical industry?
- How many milliamps make an ampere, or amp (A)?
- What is a megawatt (MW)?

NCCER Core Curriculum: Introductory Craft Skills, 2009

00102-09 Introduction to Construction Math

Applying Basic Electrical Theory

Task Number 49

Troubleshoot series circuits.

Definition

Troubleshooting must employ appropriate methods and meters. Problem should conform to common trade problems and be diagnosed according to instructor's guidelines.

Process/Skill Questions

- Which tester should be used to test current in a series circuit?
- Where is the meter placed in the series circuit to read total voltage?
- What happens to voltage in a series circuit?

NCCER Electrical Standards, 2011

26103-11 Introduction to Electrical Circuits

26104-11 Electrical Theory

26112-11 Electrical Test Equipment

Task Number 50

Troubleshoot parallel circuits.

Definition

Troubleshooting must employ appropriate methods and meters. Problem should conform to common trade problems and be diagnosed according to instructor's guidelines

Process/Skill Questions

- What are the basic steps in troubleshooting any type of circuitry?
- If 120 (V) volts is applied to the circuit, what voltage should appear on the loads?
- If one light in a connected sequence goes out, will all others go out in a parallel circuit?

NCCER Electrical Standards, 2011

26103-11 Introduction to Electrical Circuits

26104-11 Electrical Theory

26112-11 Electrical Test Equipment

Task Number 51

Wire series-parallel (combination) circuits.

Definition

Wiring should include the fabrication of a series-parallel circuit, using lab materials. Circuit must conform to common trade practices and instructor's guidelines.

Process/Skill Questions

- Why are two start buttons wired in parallel?
- Why are two stop buttons wired in series?
- Why is it important to know how to wire a series-parallel circuit?

NCCER Electrical Standards, 2011

26103-11 Introduction to Electrical Circuits

26104-11 Electrical Theory

Task Number 52

Calculate series-parallel (combination) circuits.

Definition

Calculation should include identifying relationships and solving unknown values for voltage, current, resistance, and wattage for series-parallel circuits, using Ohm's Law, according to instructor's guidelines.

Process/Skill Questions

- How is series-parallel resistance calculated?

- What is the first step in calculating a series-parallel?
- When might series-parallel circuits be used in electrical wiring?

NCCER Electrical Standards, 2011

26103-11 Introduction to Electrical Circuits

26104-11 Electrical Theory

Task Number 53

Troubleshoot series-parallel (combination) circuits.

Definition

Troubleshooting must employ appropriate methods and meters. Problem should conform to common trade problems and be diagnosed according to instructor's guidelines.

Process/Skill Questions

- What tools are used to troubleshoot a series-parallel circuit?
- Why is it important to take voltage readings at several different locations along a series-parallel circuit?
- Why is it important to follow steps when troubleshooting?

NCCER Electrical Standards, 2011

26103-11 Introduction to Electrical Circuits

26104-11 Electrical Theory

26112-11 Electrical Test Equipment

Task Number 54

Explain nameplate specifications related to motors, generators, and transformers.

Definition

Explanation should include the use of specifications obtained from the nameplate from motors, generators, and transformers.

Process/Skill Questions

- When is it necessary to read the nameplate?
- What is dual-voltage?
- What is dual-amperage?
- What data is found on a transformer's nameplate? A generator's? A motor's?

NCCER Electrical Standards, 2011

26202-11 Motors: Theory and Application

Applying the National Electrical Code (NEC) Book

Task Number 55

Apply the NEC requirements for electrical installation.

Definition

Application should involve the use of the NEC book (e.g., to locate definitions, to identify code markings) and use of NEC to calculate general job requirements, including residential, commercial, and industrial wiring methods.

Process/Skill Questions

- What is Article 250?
- Who enforces the NEC?
- Who designs and writes the code?
- What is an fine-print note (FPN)?

NCCER Electrical Standards, 2011

26105-11 Introduction to the National Electrical Code

26111-11 Residential Electrical Services

Identifying and Installing Conduit and Raceways

Task Number 56

Identify various conduits and raceways.

Definition

Correct type of conduit and wiring support materials must be selected for assigned job, using the NEC and manufacturer's specifications.

Process/Skill Questions

- What do the following acronyms stand for?
  - electric metallic tube (EMT)
  - polyvinyl chloride (PVC)
  - rigid metal conduit (RMC)
  - intermediate metal conduit (IMC)
- What is cable tray?
- What is a factory 90-degree bend?
- What is wiremold?

NCCER Electrical Standards, 2011

26106-11 Device Boxes

26107-11 Hand Bending

26108-11 Raceways and Fittings

26109-11 Conductors and Cables

26111-11 Residential Electrical Services

Task Number 57

Select material and wiring support systems.

Definition

Selection should include connectors, fittings, and supports for various conduit and raceway wiring systems, according to instructor's guidelines.

Process/Skill Questions

- What is the difference between compression and set-screw fittings for raceways?
- What are the different types of condulets?
- What are the various types of support for conduit?
- What is a seal-off?
- What is Kindorf Channel System?
- What is a Unistrut Metal Framing System?

NCCER Electrical Standards, 2011

26106-11 Device Boxes

26107-11 Hand Bending

26108-11 Raceways and Fittings

26109-11 Conductors and Cables

26111-11 Residential Electrical Services

Task Number 58

Install conduits.

Definition

Installation should include determining the correct angle of bend for assigned task, fabricating the bend with the correct tool, and mounting the conduit, using correct fasteners, in accordance with NEC and common trade practices.

Process/Skill Questions

- What is the difference between an EMT and hickey bender (segment bender)?
- What is the largest hand bender?
- How is a multiplier used for conduit bends?
- What is take up?

NCCER Electrical Standards, 2011

26106-11 Device Boxes

26107-11 Hand Bending

26108-11 Raceways and Fittings

26109-11 Conductors and Cables

26111-11 Residential Electrical Services

Examining Lighting Systems

Task Number 59

Install fixtures.

Definition

Installation of fixtures must be completed according to lighting plan and manufacturer's and NEC specifications. Installation should include testing for proper operation and troubleshooting, if necessary, according to established industry procedures.

Process/Skill Questions

- Should a shower fixture be ground fault circuit interrupter (GFCI)-protected?
- What types of boxes are used with ceiling fans?
- How are fixtures supported in a drop ceiling?

NCCER Electrical Standards, 2011

26110-11 Basic Electrical Construction Drawings

26111-11 Residential Electrical Services

Task Number 60

Explain functions, operation, and characteristics of single-phase power systems.

Definition

Explanation should include

- identifying components used in power system wiring
- stating how conduit, nonmetallic sheathed, and metal sheathed cable is routed in residential installations
- identifying the proper termination for the cabling.

Process/Skill Questions

- In a normal single-phase three-wire system, how is 120 V derived?
- In a normal single-phase three-wire system, how is 240 V derived?
- How is a neutral derived in a 120-240 V three-wire system?
- What is the difference between alternating current (AC) and direct current (DC) voltage?

NCCER Electrical Standards, 2011

26110-11 Basic Electrical Construction Drawings

26111-11 Residential Electrical Services

26112-11 Electrical Test Equipment

Task Number 61

Install power devices.

Definition

Installation should include

- choosing the proper devices used in the assigned power wiring layout
- connecting the power devices
- installing the proper termination at each outlet
- testing for proper operation and troubleshooting as necessary

according to manufacturer’s manuals, instructor’s guidelines, and NEC standards.

Process/Skill Questions

- What is a combination switch?
- How are three-way switches used? How do they work?
- Why is it important to follow manufacturers' voltage/current ratings?

NCCER Electrical Standards, 2011

26109-11 Conductors and Cables

26111-11 Residential Electrical Services

Exploring Panelboards and Switchboards

Task Number 62

Identify basic components of service entrance equipment.

Definition

Identification should include

- listing the areas where overcurrent protection devices (OCPDs) may be located in residences
- identifying OCPDs from structural plans and various available equipment
- location and type of service equipment

according to NEC standards and Authority Having Jurisdiction (AHJ).

Process/Skill Questions

- What is a multi-family dwelling?
- What is the difference between a service lateral and a service drop?
- What is a subpanel?
- What is an OCPD and what is its purpose?
- Where are the OCPDs devices found?
- What code articles reference the standard sizes for OCPD?
- What breaker size should be used on a No. 14 wire?

NCCER Electrical Standards, 2011

26105-11 Introduction to the National Electrical Code

26108-11 Raceways and Fittings

26109-11 Conductors and Cables

26110-11 Basic Electrical Construction Drawings

26111-11 Residential Electrical Services

Task Number 63

Select OCPDs.

Definition

Selection is based on identifying the types of OCPD fuses used in system wiring (plug, cartridge, blade, type S/SL) identifying the types of circuit breakers in single- and three-phase systems (single-pole 120V, double-pole 208V/240V, triple-pole 480V) using the NEC to determine the correct type of OCPD for use in existing and new installations in accordance with NEC, instructor’s guidelines, and manufacturer's nameplate data.

Process/Skill Questions

- What is a double pole OCPD?
- How are OCPDs selected in reference to wire size?
- Are different manufacturers' breakers interchangeable in the service entrance panel (SEP)?
- How do you identify whether a system is a single-phase or a three-phase system?

Task Number 64

Install OCPDs.

Definition

Installation includes replacing and/or installing

- a plug fuse in a panel or safety cutoff
- a cartridge fuse in an assigned piece of equipment (e.g., disconnect box, pullout block)
- breakers in single-phase and/or three-phase panels.

All installations must be complete and in accordance with manufacturer and NEC.

Process/Skill Questions

- How is a tripped breaker identified?
- How is a breaker reset?
- Should power be disconnected before installing an OCPD?
- Can a 20-ampere (amp) fuse stat be replaced with a 30-amp fuse stat?
- Can a 20-amp cartridge fuse be replaced with a 30-amp cartridge fuse?

NCCER Electrical Standards, 2011

26109-11 Conductors and Cables

26111-11 Residential Electrical Services

Task Number 65

Install various ground fault circuit interrupter (GFCI) and arc fault circuit interrupter (AFCI) devices.

Definition

Installation includes

- identifying a breaker-type and receptacle-type GFCI
- identifying a feed-through GFCI receptacle
- identifying an arc fault breaker type
- connecting a GFCI and an arc fault breaker in single-phase service panel
- connecting a GFCI receptacle as feed-through and in-line on specified circuits.

All connections must be complete and in accordance with manufacturer and NEC.

Process/Skill Questions

- Where are GFCIs required?
- In what areas of a dwelling are arc fault circuits required?
- What is the function of a GFCI?
- How is a GFCI tested?
- What is the function of an arc fault?

NCCER Electrical Standards, 2011

26111-11 Residential Electrical Services

26112-11 Electrical Test Equipment

Identifying and Installing Grounding Systems

Task Number 66

Identify characteristics of grounding systems.

Definition

Identification should be based on the NEC, and should include

- explaining the purpose of grounding
- distinguishing between a short circuit and a ground fault
- defining a grounded circuit
- explaining the requirements for physical protection of the grounding electrode conductor
- defining *made electrodes*
- defining the use of a grounding electrode system
- explaining the use of a main bonding jumper
- distinguishing between grounding and bonding
- explaining the purpose of the grounded conductor
- explaining the requirements for grounding more than one building
- explaining the requirements for grounding subpanels.

Process/Skill Questions

- In which article in the NEC would you find grounding systems?
- What is the definition of *ground*?
- What is a man-made grounding system?
- Why is grounding important?
- What is the difference between *ground--ed* and *ground--ing*?

NCCER Electrical Standards, 2011

26109-11 Conductors and Cables

26111-11 Residential Electrical Services

Task Number 67

Illustrate sizing, layout, and installation of grounding systems.

Definition

Illustration should be based on the latest NEC, and should consist of

- a grounding system for a dwelling with 10 feet of metal pipe
- a grounding system for a dwelling with no metal pipe
- a grounding system between a panel and a subpanel
- using the appropriate NEC table to select grounding electrode conductors
- using the appropriate NEC table to select grounding conductors for raceways and equipment.

Process/Skill Questions

- What is the largest grounding conductor to a supplementary grounding rod?
- What is a grounding ring?
- What is the minimum distance between multiple ground rods?

NCCER Electrical Standards, 2011

26109-11 Conductors and Cables

26111-11 Residential Electrical Services

Installing Transformers

Task Number 68

Install transformers.

Definition

Installation consists of

- connecting transformer to achieve the following results: step-up, step-down, small volt-ampere (VA) transformer for a bell system
- connecting power transformer to an assigned load

- connecting ballast transformer (120V, 277V).

All connections must be made in accordance with NEC and manufacturer's recommendations.

Process/Skill Questions

- Can a 16 V transformer be installed on a service panel?
- What is the primary winding?
- What precautions should be taken when installing a transformer?

NCCER Electrical Standards, 2011

26109-11 Conductors and Cables

26111-11 Residential Electrical Services

26112-11 Electrical Test Equipment

SOL Correlation by Task

39	Comply with federal, state, and local safety legal requirements.	English: 11.5, 12.5 History and Social Science: GOVT.9, GOVT.15, GOVT.16 Science: BIO.1a, CH.1b
40	Maintain a safe working environment.	English: 11.5, 12.5
41	Explain safe working practices around electrical hazards.	English: 11.5, 12.5 History and Social Science: GOVT.16
42	Inspect course-specific hand and power tools to visually identify defects.	English: 11.5, 12.5
43	Report injuries.	English: 11.6 History and Social Science: GOVT.16
44	Report personal, environmental, and equipment safety violations to the appropriate authority.	English: 11.6, 12.6 History and Social Science: GOVT.16
45	Pass safety exam.	English: 11.5, 12.5, 12.6
46	Solve problems using direct and inverse relationships.	Mathematics: A.4, AII.3
47	Solve electrical problems using calculators.	English: 11.5, 12.5
48	Convert metric prefixes to their numerical equivalents and vice-versa.	Science: PH.1g
49	Troubleshoot series circuits.	Science: PH.11c
50	Troubleshoot parallel circuits.	English: 11.5, 12.5

		Science: PH.11c
51	Wire series-parallel (combination) circuits.	English: 11.5, 12.5 Science: PH.11c
52	Calculate series-parallel (combination) circuits.	English: 11.5, 12.5 Mathematics: A.4, A.8, AII.3 Science: PH.11c
53	Troubleshoot series-parallel (combination) circuits.	Science: PH.11c
54	Explain nameplate specifications related to motors, generators, and transformers.	English: 11.5, 12.5
55	Apply the NEC requirements for electrical installation.	English: 11.5, 12.5
56	Identify various conduits and raceways.	English: 11.5, 12.5
57	Select material and wiring support systems.	
58	Install conduits.	English: 11.5, 12.5
59	Install fixtures.	
60	Explain functions, operation, and characteristics of single-phase power systems.	English: 11.5, 12.5
61	Install power devices.	English: 11.5, 12.5
62	Identify basic components of service entrance equipment.	English: 11.5, 12.5
63	Select OCPDs.	English: 11.5, 12.5
64	Install OCPDs.	English: 11.5, 12.5
65	Install various ground fault circuit interrupter (GFCI) and arc fault circuit interrupter (AFCI) devices.	English: 11.5, 12.5
66	Identify characteristics of grounding systems.	English: 11.3, 11.5, 12.3, 12.5 Science: PH.11c
67	Illustrate sizing, layout, and installation of grounding systems.	Science: PH.11c
68	Install transformers.	English: 11.5, 12.5 Science: PH.11c

Green Building Infusion Units

The Green Building Infusion Unit (GBIU) was designed to encourage teachers to infuse instructional units on green building knowledge and skills into designated CTE courses. The infusion unit is not mandatory, and, as such, the tasks/competencies are marked as "optional," to be taught at the instructor's discretion. Teachers can find the infusion/unit in the course listing.

Entrepreneurship Infusion Units

Entrepreneurship Infusion Units may be used to help students achieve additional, focused competencies and enhance the validated tasks/competencies related to identifying and starting a new business venture. Because the unit is a complement to certain designated courses and is not mandatory, all tasks/competencies are marked "optional." Teachers can find the infusion/unit in the course listing.

Appendix: Credentials, Course Sequences, and Career Cluster Information

Industry Credentials: Only apply to 36-week courses

- Certified Satellite Installer (CSI) Examination
- College and Work Readiness Assessment (CWRA+)
- Core: Introductory Craft Skills Entry-Level Assessment
- Customer Service Examination
- Customer Service Specialist (CSS) Examination
- Data Cabling Installer (DCI) Examination
- Electric Power and Distribution Assessment
- Electrical Construction Technology Assessment
- Electrical Construction Wiring (Residential Wiring) Examination
- Electrical Occupations Assessment
- Electrician Level One Entry-Level Assessment
- Electronics Module: Digital Basics (EM4) Examination
- Fiber Optics Installer (FOI) Examination
- HBI/NAHB Residential Construction Academy (RCA) Series Student Certification Assessments
- ICC Certificates of Completion Examinations
- International Code Council Residential Electrical Inspector (E1) Examination
- National Career Readiness Certificate Assessment
- Network Cabling Specialist Certification Examinations
- Photovoltaic Installer - Level 1 (PVI1) Examination
- Pre-Apprenticeship Certificate Training (PACT) Core Examinations
- Professional Communications Certification Examination
- Workplace Readiness Skills for the Commonwealth Examination

Concentration sequences: *A combination of this course and those below, equivalent to two 36-week courses, is a concentration sequence. Students wishing to complete a specialization may take additional courses based on their career pathways. A program completer is a student who has met the requirements for a CTE concentration sequence and all other requirements for high school graduation or an approved alternative education program.*

- Electricity I (8533/36 weeks, 140 hours)

Career Cluster: Architecture and Construction	
Pathway	**Occupations**
Construction	**Construction Manager** **Electrician** **General Contractor**
Design/Pre-Construction	**Building Code Inspector** **Cost Estimator** **Electrical Engineering Technician**