

2012 – 2013

**Florida Department of Education
Curriculum Framework**

Program Title: Electrical Line Service and Repair
Program Type: Career Preparatory
Career Cluster: Energy

PSAV	
Program Number	I460303
CIP Number	0646030300
Grade Level	30,31
Standard Length	1500 Hours
Teacher Certification	ELECTRICAL @7G TEC ELEC @7G
CTSO	SkillsUSA
SOC Codes (all applicable)	49-9051
Facility Code	245 - http://www.fldoe.org/edfacil/sref.asp (State Requirements for Educational Facilities)
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm
Perkins Technical Skill Attainment Inventory	http://www.fldoe.org/workforce/perkins/perkins_resources.asp
Industry Certifications	http://www.fldoe.org/workforce/fcpea/default.asp
Statewide Articulation	http://www.fldoe.org/workforce/dwdframe/artic_frame.asp
Basic Skills Level	Mathematics: 9 Language: 9 Reading: 9

Purpose

The purpose of this program is to prepare students for employment as Electrical Powerline Installer.

This program focuses on broad, transferable skills and stresses understanding and demonstration of the following elements of the Electric Line Service and Repair industry; planning, management, finance, technical and product skills, underlying principles of technology, labor issues, community issues and health, safety, and environmental issues.

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to

prepare for further education and careers in the Energy career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the Energy career cluster.

Program Structure

This program is a planned sequence of instruction consisting of one occupational completion points.

When offered at the postsecondary adult career and technical level, this program is comprised of courses which have been assigned course numbers in the SCNS (Statewide Course Numbering System) in accordance with Section 1007.24 (1), F.S. Career and Technical credit shall be awarded to the student on a transcript in accordance with Section 1001.44(3)(b), F.S.

The following table illustrates the program structure:

OCP	Course Number	Course Title	Course Length	SOC Code
A	EEV0151	Electrical Powerline Installer 1	1500 Hours	49-9051

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Career and Technical Student Organization (CTSO)

SkillsUSA, Inc. is the appropriate career and technical student organization for providing leadership training and reinforcing specific career and technical skills. Career and Technical Student Organizations provide activities for students as an integral part of the instruction offered. The activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065, F.A.C.

Cooperative Training – OJT

On-the-job training is appropriate but not required for this program. Whenever offered, the rules, guidelines, and requirements specified in the OJT framework apply.

Essential Skills

Essential skills identified by the Division of Career and Adult Education have been integrated into the standards and benchmarks of this program. These skills represent the general knowledge and skills considered by industry to be essential for success in careers across all career clusters. Students preparing for a career served by this program at any level should be able to demonstrate these skills in the context of this program. A complete list of Essential

Skills and links to instructional resources in support of these Essential Skills are published on the CTE Essential Skills page of the FL-DOE website (http://www.fldoe.org/workforce/dwdframe/essential_skills.asp).

Basic Skills

In PSAV programs offered for 450 hours or more, in accordance with Rule 6A-10.040, F.A.C., the minimum basic skills grade levels required for postsecondary adult career and technical students to complete this program are: Mathematics 9, Language 9, and Reading 9. These grade level numbers correspond to a grade equivalent score obtained on a state designated basic skills examination.

Adult students with disabilities, as defined in Section 1004.02(7), Florida Statutes, may be exempted from meeting the Basic Skills requirements (Rule 6A-10.040). Students served in exceptional student education (except gifted) as defined in s. 1003.01(3)(a), F.S., may also be exempted from meeting the Basic Skills requirement. Each school district and Florida College must adopt a policy addressing procedures for exempting eligible students with disabilities from the Basic Skills requirement as permitted in Section 1004.91(3), F.S.

Students who possess a college degree at the Associate of Applied Science level or higher; who have completed or are exempt from the college entry-level examination; or who have passed a state, national, or industry licensure exam are exempt from meeting the Basic Skills requirement (Rule 6A-10.040, F.A.C.) Exemptions from state, national or industry licensure are limited to the certifications listed at <http://www.fldoe.org/workforce/dwdframe/rtf/basicskills-License-exempt.rtf>.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations' plan to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their counselor and/or instructors. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

In addition to accommodations, some secondary students with disabilities (students with an Individual Educational Plan (IEP) served in Exceptional Student Education or ESE) will need modifications to meet their needs. Modifications change the outcomes or what the student is expected to learn, e.g., modifying the curriculum of a secondary career and technical education course. Note postsecondary curriculum cannot be modified.

Some secondary students with disabilities (ESE) may need additional time (i.e., longer than the regular school year), to master the student performance standards associated with a regular Occupational Completion Point (OCP) or a Modified Occupational Completion Point (MOCP). If needed, a student may enroll in the same career and technical course more than once. Documentation should be included in the IEP that clearly indicates that it is anticipated that the

student may need an additional year to complete an OCP/MOCP. The student should work on different competencies and new applications of competencies each year toward completion of the OCP/MOCP. After achieving the competencies identified for the year, the student earns credit for the course. It is important to ensure that credits earned by students are reported accurately. The district's information system must be designed to accept multiple credits for the same course number (for eligible students with disabilities).

Articulation

This program has no statewide articulation agreement approved by the Articulation Coordinating Committee. However, this does not preclude the awarding of credits by any college through local agreements.

For details on statewide articulation agreements which correlate to programs and industry certifications, refer to http://www.fl DOE.org/workforce/dwdframe/artic_frame.asp.

Standards

After successfully completing this program, the student will be able to perform the following:

- 01.0 Demonstrate proficiency in applying basic electrical/electronic principles.
- 02.0 Demonstrate science knowledge and skills.
- 03.0 Demonstrate mathematics knowledge and skills.
- 04.0 Demonstrate proficiency in installing electrical distribution systems.
- 05.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas.
- 06.0 Demonstrate proficiency in street and security lighting activities.
- 07.0 Demonstrate language arts knowledge and skills.
- 08.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.
- 09.0 Demonstrate proficiency in maintenance and inspection duties.
- 10.0 Use information technology tools.
- 11.0 Demonstrate personal money-management concepts, procedures, and strategies.
- 12.0 Demonstrate proficiency in troubleshooting and repairing system components.
- 13.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives.
- 14.0 Demonstrate proficiency in utilizing electrical line service tools and equipment.
- 15.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment.
- 16.0 Demonstrate proficiency in operator functions on high reach trucks.
- 17.0 Solve problems using critical thinking skills, creativity and innovation.
- 18.0 Describe the importance of professional ethics and legal responsibilities.
- 19.0 Explain the importance of employability and entrepreneurship skills.

2012 – 2013

**Florida Department of Education
Student Performance Standards**

Program Title: Electric Line Service and Repair
PSAV Number: I460303

Course Number: EEV0151
Occupational Completion Point: A
Electrical Powerline Installer – 1500 Hours – SOC Code 49-9051

- 01.0 Demonstrate proficiency in applying basic electrical/electronic principles--The student will be able to:
- 01.01 Interpret electrical terms.
 - 01.02 Identify electrical symbols.
 - 01.03 Construct common electrical circuits.
 - 01.04 Compute for voltage, current, resistance and power.
 - 01.05 Operate meters to measure electrical properties.
 - 01.06 Discuss transformer theory.
 - 01.07 Apply electronic principles where applicable.
 - 01.08 Interpret electronic terms and symbols.
- 02.0 Demonstrate science knowledge and skills--The student will be able to: AF 4.0
- 02.01 Understand molecular action as a result of temperature extremes, chemical reaction, and moisture content.
 - 02.02 Discuss the role of creativity in constructing scientific questions, methods and explanations. AF 4.1
 - 02.03 Formulate scientifically investigable questions, construct investigations, collect and evaluate data, and develop scientific recommendations based on findings. AF 4.3
 - 02.04 Identify health-related problems, which may result from exposure to work related chemicals and hazardous materials, and know the proper precautions required for handling such materials.
 - 02.05 Understand pressure measurement in terms of PSI, inches of mercury, and KPA.
- 03.0 Demonstrate mathematics knowledge and skills--The students will be able to: AF 3.0
- 03.01 Demonstrate knowledge of arithmetic operations. AF 3.2
 - 03.02 Analyze and apply data and measurements to solve problems and interpret documents. AF 3.4
 - 03.03 Read and interpret measuring devices (rules and tapes).
 - 03.04 Add 100 addition combinations.
 - 03.05 Add two-digit numbers.
 - 03.06 Add three-digit numbers.
 - 03.07 Subtract 100 subtraction combinations.
 - 03.08 Subtract two-, three- and four-digit numbers.
 - 03.09 Solve one-digit divisor problems.
 - 03.10 Solve two-digit divisor problems.
 - 03.11 Solve two- and three-digit divisor problems.
 - 03.12 Solve multiplication facts.

- 03.13 Multiply by a one-digit factor.
- 03.14 Multiply by a two-digit factor.
- 03.15 Identify the parts of a fraction.
- 03.16 Solve fractional word problems.
- 03.17 Classify types of fractions.
- 03.18 Illustrate equivalent fractions.
- 03.19 Convert fractions.
- 03.20 Reduce fractions.
- 03.21 Solve decimal notations.
- 03.22 Solve number word problems.
- 03.23 Round to the nearest whole number.
- 03.24 Add decimals.
- 03.25 Subtract decimals.
- 03.26 Multiply decimals.
- 03.27 Divide a decimal by a decimal.
- 03.28 Divide a whole number by a decimal.
- 03.29 Write fractions as decimals and percents.
- 03.30 Write percents add fractions and decimals.
- 03.31 Solve percent problems.
- 03.32 Find the percent of a number.
- 03.33 Operate a calculator.
- 03.34 Understand and use the metric system.
- 03.35 Convert inches to millimeters and millimeters to inches.
- 03.36 Construct charts/tables/graphs using functions and data. AF 3.5
- 03.37 Solve problems for volume, weight, area, circumference and perimeter measurements for rectangles, squares, and cylinders.
- 03.38 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, feet and inches.
- 03.39 Add, subtract, multiply and divide using fractions, decimals, and whole numbers.
- 03.40 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
- 03.41 Demonstrate an understanding of federal, state and local taxes and their computation.

04.0 Demonstrate proficiency in installing electrical distribution systems--The student will be able to:

- 04.01 Set poles manually and using power equipment.
- 04.02 Transport, unload and position poles.
- 04.03 Frame pole.
- 04.04 Install guy anchor and wires.
- 04.05 Climb poles using climbing equipment.
- 04.06 Hoist materials or equipment to lines.
- 04.07 String conductors.
- 04.08 Cut or splice conductors.
- 04.09 Sag conductors.
- 04.10 Install tie wires.
- 04.11 Fabricate tie wires.
- 04.12 Install pole equipment (cross arms, transformers, fuse cutouts, insulators, air switches, arrestors and pole steps).
- 04.13 Install capacitor banks.

- 04.14 Install substation equipment.
 - 04.15 Install utility meters.
 - 04.16 Install armor rods.
 - 04.17 Install direct burial cable.
 - 04.18 Install cable markers.
 - 04.19 Fabricate underground duct systems.
 - 04.20 Install underground cable ducts.
 - 04.21 Rig manholes for cable pulling.
 - 04.22 Splice high voltage underground cable.
 - 04.23 Terminate high voltage cable underground and above ground.
 - 04.24 Install cable racks.
 - 04.25 Install and test grounding systems.
- 05.0 Use oral and written communication skills in creating, expressing and interpreting information and ideas--The students will be able to:
- 05.01 Select and employ appropriate communication concepts and strategies to enhance oral and written communication in the workplace. CM 1.0
 - 05.02 Locate, organize and reference written information from various sources. CM 3.0
 - 05.03 Design, develop and deliver formal and informal presentations using appropriate media to engage and inform diverse audiences. CM 5.0
 - 05.04 Interpret verbal and nonverbal cues/behaviors that enhance communication. CM 6.0
 - 05.05 Apply active listening skills to obtain and clarify information. CM 7.0
 - 05.06 Develop and interpret tables and charts to support written and oral communications. CM 8.0
 - 05.07 Exhibit public relations skills that aid in achieving customer satisfaction. CM 10.0
- 06.0 Demonstrate proficiency in street and security lighting activities--The student will be able to:
- 06.01 Install street light fixtures.
 - 06.02 Install flood light fixtures.
 - 06.03 Install lighting control components.
 - 06.04 Install ballast.
 - 06.05 Isolate system for test.
 - 06.06 Adjust timers and controls.
 - 06.07 Relamp fixtures.
- 07.0 Demonstrate language arts knowledge and skills--The students will be able to: AF 2.0
- 07.01 Locate, comprehend and evaluate key elements of oral and written information. AF 2.4
 - 07.02 Draft, revise, and edit written documents using correct grammar, punctuation and vocabulary. AF 2.5
 - 07.03 Present information formally and informally for specific purposes and audiences. AF 2.9
- 08.0 Demonstrate the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance--The students will be able to:
- 08.01 Describe personal and jobsite safety rules and regulations that maintain safe and healthy work environments. SHE 1.0

- 08.02 Explain emergency procedures to follow in response to workplace accidents.
- 08.03 Create a disaster and/or emergency response plan. SHE 2.0
- 08.04 Demonstrate knowledge of the "Right-To-Know Law" as recorded in (29 CFR-1910.1200).

09.0 Demonstrate proficiency in maintenance and inspection duties--The student will be able to:

- 09.01 Control vegetation in powerline right-of-way.
- 09.02 Control vegetation in substations.
- 09.03 Inspect conductors for uniform sag.
- 09.04 Inspect poles and cross arms.
- 09.05 Check for corroded hardware.
- 09.06 Check fuse cutouts.
- 09.07 Check high voltage switches.
- 09.08 Check circuit breakers and regulators.
- 09.09 Inspect fences and warning signs.
- 09.10 Perform di-electric tests.
- 09.11 Perform load test.
- 09.12 Maintain all electrical components.
- 09.13 Recover equipment.
- 09.14 Read service meters.
- 09.15 Realign existing poles.
- 09.16 Pump water from manholes.
- 09.17 Check for deterioration of cable, connectors, and poles.

10.0 Use information technology tools--The students will be able to:

- 10.01 Use Personal Information Management (PIM) applications to increase workplace efficiency. IT 1.0
- 10.02 Employ technological tools to expedite workflow including word processing, databases, reports, spreadsheets, multimedia presentations, electronic calendar, contacts, email, and internet applications. IT 2.0
- 10.03 Employ computer operations applications to access, create, manage, integrate, and store information. IT 3.0
- 10.04 Employ collaborative/groupware applications to facilitate group work. IT 4.0

11.0 Demonstrate personal money-management concepts, procedures, and strategies--The students will be able to:

- 11.01 Identify and describe the services and legal responsibilities of financial institutions. FL 2.0
- 11.02 Describe the effect of money management on personal and career goals. FL 3.0
- 11.03 Develop a personal budget and financial goals. FL 3.1
- 11.04 Complete financial instruments for making deposits and withdrawals. FL 3.2
- 11.05 Maintain financial records. FL 3.3
- 11.06 Read and reconcile financial statements. FL 3.4
- 11.07 Research, compare and contrast investment opportunities.

12.0 Demonstrate proficiency in troubleshooting and repairing system components--The student will be able to:

- 12.01 Replace defective conductor.
 - 12.02 Transfer dead conductor to new pole.
 - 12.03 Remove foreign objects from conductor.
 - 12.04 Simulate the transfer of hot conductor to new pole.
 - 12.05 Splice dead or hot conductors.
 - 12.06 Convert transformer banks to open delta.
 - 12.07 Replace cross arms.
 - 12.08 Climb through simulated hot equipment using rubber protective devices.
 - 12.09 Trace faulty underground cable.
 - 12.10 Discuss substation breakers, transformers, regulators, and relays.
- 13.0 Demonstrate leadership and teamwork skills needed to accomplish team goals and objectives--The students will be able to:
- 13.01 Employ leadership skills to accomplish organizational goals and objectives.LT 1.0
 - 13.02 Establish and maintain effective working relationships with others in order to accomplish objectives and tasks. LT 3.0
 - 13.03 Conduct and participate in meetings to accomplish work tasks. LT 4.0
 - 13.04 Employ mentoring skills to inspire and teach others. LT 5.0
- 14.0 Demonstrate proficiency in utilizing electrical line service tools and equipment--The student will be able to:
- 14.01 Utilize hand tools safely.
 - 14.02 Utilize hotline tools safely.
 - 14.03 Utilize rubber protection as needed.
 - 14.04 Operate pool trailer.
 - 14.05 Operate reel jacks.
 - 14.06 Operate cable pulling guide.
 - 14.07 Operate shop power tools.
 - 14.08 Operate hoist.
 - 14.09 Operate climbing equipment.
 - 14.10 Operate multimeter.
 - 14.11 Operate clamp-on ammeter.
 - 14.12 Operate phase rotation meter.
 - 14.13 Operate meter.
 - 14.14 Operate gas detector.
 - 14.15 Operate hot stick tester.
 - 14.16 Operate high voltage phase tester.
 - 14.17 Operate recording ammeter/voltmeter.
 - 14.18 Discuss a relay tester.
 - 14.19 Discuss vibro ground
 - 14.20 Operate power trencher.
 - 14.21 Clean facilities and shop.
- 15.0 Describe the roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment--The students will be able to:
- 15.01 Describe the nature and types of business organizations. SY 1.0
 - 15.02 Explain the effect of key organizational systems on performance and quality.

- 15.03 List and describe quality control systems and/or practices common to the workplace. SY 2.0
- 15.04 Explain the impact of the global economy on business organizations.
- 16.0 Demonstrate proficiency in utility construction equipment operation and maintenance--
The student will be able to:
- 16.01 Demonstrate safe work practice for operating machinery.
- 16.02 Demonstrate routine daily inspection to trucks and mobile equipment.
- 16.03 Inspect hydraulic systems for operational integrity.
- 16.04 "Fly" a boom for safety inspection.
- 16.05 Demonstrate understanding of dielectric testing of an insulated boom section.
- 16.06 Clean and maintain dielectric bucket liners and boom insulators.
- 16.07 Maintain and install vehicle grounds.
- 16.08 Safely jump-start a vehicle.
- 16.09 Inspect equipment for safe operational conditions.
- 16.10 Safely load, secure and unload a variety of equipment from a drive-on trailer.
- 16.11 Read a load lifting chart.
- 16.12 Plan a lift.
- 16.13 Accurately give hand signals to a boom truck operator.
- 16.14 Set up an aerial truck for operation.
- 16.15 Safely operate an aerial lift truck.
- 16.16 Safely operate a boom truck.
- 16.17 Safely operate a pole-hole digger truck.
- 16.18 Safely operate an operator seated trenching machine.
- 16.19 Safely operate a walk behind trencher.
- 16.20 Safely operate a backhoe.
- 16.21 Safely operate a horizontal boring machine.
- 17.0 Solve problems using critical thinking skills, creativity and innovation--The students will be able to:
- 17.01 Employ critical thinking skills independently and in teams to solve problems and make decisions. PS 1.0
- 17.02 Employ critical thinking and interpersonal skills to resolve conflicts. PS 2.0
- 17.03 Identify and document workplace performance goals and monitor progress toward those goals. PS 3.0
- 17.04 Conduct technical research to gather information necessary for decision-making. PS 4.0
- 18.0 Describe the importance of professional ethics and legal responsibilities--The students will be able to:
- 18.01 Evaluate and justify decisions based on ethical reasoning. ELR 1.0
- 18.02 Evaluate alternative responses to workplace situations based on personal, professional, ethical, legal responsibilities, and employer policies. ELR 1.1
- 18.03 Identify and explain personal and long-term consequences of unethical or illegal behaviors in the workplace. ELR 1.2
- 18.04 Interpret and explain written organizational policies and procedures. ELR 2.0
- 19.0 Explain the importance of employability and entrepreneurship skills--The students will be able to:

- 19.01 Identify and demonstrate positive work behaviors needed to be employable.ECD 1.0
- 19.02 Develop personal career plan that includes goals, objectives, and strategies.ECD 2.0
- 19.03 Examine licensing, certification, and industry credentialing requirements. ECD 3.0
- 19.04 Maintain a career portfolio to document knowledge, skills, and experience.ECD 5.0
- 19.05 Evaluate and compare employment opportunities that match career goals.ECD 6.0
- 19.06 Identify and exhibit traits for retaining employment. ECD 7.0
- 19.07 Identify opportunities and research requirements for career advancement.ECD 8.0
- 19.08 Research the benefits of ongoing professional development. ECD 9.0
- 19.09 Examine and describe entrepreneurship opportunities as a career planning
option. ECD 10.0