

July 2006

Florida Department of Education
Outcomes - Standards

Program Title: Telecommunications Technology

CIP Number 0647010301

Length - 300 hours - Certificate

INTENDED OUTCOMES:

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

- 01.0 Explain and practice workplace safety.
- 02.0 Demonstrate basic work practices.
- 03.0 Demonstrate employability skills
- 04.0 Demonstrate the use of safety equipment.
- 05.0 Inspect tools and equipment.
- 06.0 Inspect test equipment.
- 07.0 Explain industry code of conduct.
- 08.0 Demonstrate traffic control.
- 09.0 Demonstrate pole climbing.
- 10.0 Explain roadside safety.
- 11.0 Explain electrical hazards.
- 12.0 Perform data line safety checks
- 13.0 Demonstrate proficiency in making electrical connections, splices and basic field repair skills.
- 14.0 Troubleshoot and repair telecommunication system wiring.
- 15.0 Demonstrate proficiency in customer relations.
- 16.0 Demonstrate appropriate communication skills.
- 17.0 Demonstrate an understanding of entrepreneurship.
- 18.0 Demonstrate proficiency in basic D. C. circuits.
- 19.0 Demonstrate appropriate understanding of basic math.
- 20.0 Demonstrate proficiency in the use of tools, equipment and materials used in the telecommunications industry
- 21.0 Demonstrate appropriate understanding of basic science.
- 22.0 Demonstrate proficiency in basic A. C. circuits.
- 23.0 Analyze technical data associated with cable validation and fault location.
- 24.0 Install, repair, terminate and test network cabling.
- 25.0 Demonstrate advanced skills in test equipment usage to locate faults.

STUDENT PERFORMANCE STANDARDS

Program Title: Telecommunications Technology

- 01.0 **EXPLAIN AND DEMONSTRATE WORKPLACE SAFETY**--The student will be able to:
 - 01.01 Demonstrate office safety
 - 01.02 Demonstrate safety outside of the office.
 - 01.03 Explain fiber optics safety.
 - 01.04 Demonstrate safety for splicing.
 - 01.05 Demonstrate or explain bucket truck safety. (Optional)

- 02.0 **DEMONSTRATE BASIC WORK PRACTICES**--The student will be able to:
 02.01 Demonstrate good work attitudes.
 02.02 Explain work and business ethics.
 02.03 Explain general code of conduct.
- 03.0 **DEMONSTRATE EMPLOYABILITY SKILLS**--The student will be able to:
 03.01 Prepare a resume.
 03.02 Conduct a job search.
 03.03 Secure information about a job.
 03.04 Identify and provide documents, which may be required when interviewed for a job.
 03.05 Complete a job application form correctly and completely.
 03.06 Practice job interview techniques.
 03.07 Identify and demonstrate appropriate response to criticism from employer, supervisor or other employees.
 03.08 Identify and demonstrate acceptable work habits.
 03.09 Demonstrate knowledge of how to make job changes appropriately.
 03.10 Demonstrate knowledge of employee health issues.
 03.11 Demonstrate efficient organizational skills.
 03.12 Demonstrate knowledge of the "Right-To-Know Law" as recorded in (29 CFR-1910.1200).
- 04.0 **DEMONSTRATE THE USE OF SAFETY EQUIPMENT**--The student will be able to:
 04.01 Correctly use personal safety equipment used in the telecommunications industry.
 04.02 Explain the hazards associated with telecommunications industry.
- 05.0 **INSPECT TOOLS AND EQUIPMENT**--The student will be able to:
 05.01 Safety, inspect support equipment.
 05.02 Safety, inspect tools.
- 06.0 **INSPECT TEST EQUIPMENT**--The student will be able to:
 06.01 Evaluate and inspect test equipment.
- 07.0 **EXPLAIN INDUSTRY CODE OF CONDUCT**--The student will be able to:
 07.01 Explain the purpose of a code of conduct.
 07.02 List the basic parts of his/her Industry code of conduct.
 07.03 Explain how the code of conduct protects both customers and workers.
 07.04 Explain the relationship between code of conduct and the laws governing privacy of telephone conversations.
- 08.0 **DEMONSTRATE TRAFFIC CONTROL**--The student will be able to:
 08.01 Use roadside signals. (Optional)
 08.02 Use signage, barricades and cones. (Optional)
 08.03 Perform flagging, and hand signals (Optional)
 08.04 Explain general outside safety procedures.
- 09.0 **DEMONSTRATE POLE CLIMBING**--The student will be able to:
 09.01 Conduct pole-climbing safety inspection. (Optional)
 09.02 Use pole-climbing equipment in a safe and correct manner. (Optional)
 09.03 Explain the hazards of pole climbing.
 09.04 Demonstrate safe and correct ladder usage.

- 09.05 Select correct ladder for telecommunication work.
 - 09.06 Demonstrate ladder rigging for aerial installation.
 - 09.07 Demonstrate pole climbing to install drops and perform splicing. (Optional)
- 10.0 **EXPLAIN ROADSIDE SAFETY**--The student will be able to:
- 10.01 Explain the hazards encountered around roadways.
 - 10.02 Work in a safe manner around roadways. (Optional)
- 11.0 **EXPLAIN ELECTRICAL HAZARDS**--The student will be able to:
- 11.01 Identify the hazards associated with work on telecommunication lines and equipment.
 - 11.02 Test and analyze various telecommunications equipment and lines for safety hazards.
- 12.0 **PERFORM DATA LINE SAFETY CHECKS**--The student will be able to:
- 12.01 Check and identify hazardous line currents and voltages.
- 13.0 **DEMONSTRATE PROFICIENCY IN MAKING ELECTRICAL CONNECTIONS, SPLICES AND BASIC FIELD REPAIR**--The student will be able to:
- 13.01 Apply proper Occupational Safety Health Administration (OSHA) Safety Standards.
 - 13.02 Make electrical connections.
 - 13.03 Identify and use hand tools properly.
 - 13.04 Identify and use power tools properly.
 - 13.05 Demonstrate acceptable soldering techniques.
 - 13.06 Demonstrate acceptable desoldering techniques.
 - 13.07 Demonstrate electrostatic discharge (ESD) safety procedures.
 - 13.08 Describe the construction of printed circuit boards (PCB's). (Optional)
 - 13.09 Demonstrate rework and repair techniques. (Optional)
- 14.0 **TROUBLESHOOT AND REPAIR TELECOMMUNICATION SYSTEM WIRING**--The student will be able to:
- 14.01 Test telecommunication systems and evaluate based on established criteria.
 - 14.02 Identify range of fault conditions for telecommunication systems.
 - 14.03 Demonstrate Telecommunication fault identification skills.
 - 14.04 Use field documentation techniques for repair of systems.
 - 14.05 Use test equipment and logic to locate faults.
 - 14.06 Demonstrate proficiency in repair techniques using splices, closure assembly and punch-down terminations.
 - 14.07 Validate repaired system to industry criteria.
- 15.0 **DEMONSTRATE PROFICIENCY IN CUSTOMER RELATIONS**--The student will be able to:
- 15.01 Describe and demonstrate appropriate personal hygiene and professional attire.
 - 15.02 Describe and demonstrate effective listening techniques.
 - 15.03 Describe and apply techniques for installing customer confidence and satisfaction.
 - 15.04 Describe and apply techniques for keeping the customer informed
 - 15.05 Describe and apply effective follow-up techniques.

- 15.06 Demonstrate discretion in interacting with customers in field and retail environments.
- 15.07 Demonstrate an understanding of basic conflict resolution.
- 16.0 **DEMONSTRATE APPROPRIATE COMMUNICATION SKILLS**--The student will be able to:
 - 16.01 Write logical and understandable statement, or phrases, to accurately fill out forms and invoices commonly used in business and industry.
 - 16.02 Read and use graphs, charts, diagrams, tables, parts manuals, and information sources commonly used in this industry/occupational area.
 - 16.03 Read and follow written and oral instructions.
 - 16.04 Answer and ask questions coherently and concisely.
 - 16.05 Read critically by recognizing assumptions and implications and by evaluating ideas.
 - 16.06 Demonstrate appropriate telephone/communication skills.
- 17.0 **DEMONSTRATE AN UNDERSTANDING OF ENTREPRENEURSHIP**--The student will be able to:
 - 17.01 Identify characteristics of the American Enterprise System.
 - 17.02 Define inflation and deflation.
 - 17.03 Explain the basic economic questions facing any society.
 - 17.04 Explain the results and change in demand or a change in supply.
 - 17.05 List factors, which contribute to economic growth.
 - 17.06 Identify characteristics of different types of business ownership.
 - 17.07 Choose the appropriate action in a situation requiring application of business ethics.
- 18.0 **DEMONSTRATE PROFICIENCY IN BASIC D.C. CIRCUITS**--The student will be able to:
 - 18.01 Solve problems in electronics units utilizing metric prefixes.
 - 18.02 Identify sources of electricity.
 - 18.03 Define voltage, current, resistance, power and energy.
 - 18.04 Apply ohm's law and power formulas.
 - 18.05 Identify and interpret industry appropriate, color codes and symbols to identify electrical components and values.
 - 18.06 Measure properties of a circuit using volt-ohm meter (VOM) and digital volt-com meter (DVM) and oscilloscopes.
 - 18.07 Compute conductance and compute and measure resistance of conductors and insulators.
 - 18.08 Apply ohm's law to series circuits.
 - 18.09 Construct and verify operation of series circuits.
 - 18.10 Analyze and troubleshoot series circuits.
 - 18.11 Apply ohm's law to parallel circuits.
 - 18.12 Construct and verify the operation of parallel circuits.
 - 18.13 Analyze and troubleshoot parallel circuits.
- 19.0 **DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC MATH**--The student will be able to:
 - 19.01 Solve problems for volume, weight, area and circumference and perimeter measurements for rectangles, square and cylinders.

- 19.02 Measure tolerance(s) on horizontal and vertical surfaces using millimeters, centimeters, and feet and inches.
 - 19.03 Add, subtract, multiply and divide using fractions, decimals and whole numbers.
 - 19.04 Determine the correct purchase price, to include sales tax for a materials list containing a minimum of six items.
 - 19.05 Demonstrate an understanding of federal, state and local taxes and their computation.
 - 19.06 Use basic algebra to solve job related problems.
- 20.0 **DEMONSTRATE PROFICIENCY IN THE USE OF TOOLS AND TEST EQUIPMENT USED IN THE TELECOMMUNICATIONS INDUSTRY** - - The student will be able to:
- 20.01 Install Twisted pair cabling systems.
 - 20.02 Terminate twisted pair cords, plugs, and outlets.
 - 20.03 Test installed cables.
 - 20.04 Troubleshoot cables.
 - 20.05 Demonstrate proficiency in the current techniques and equipment used in the telecommunications industry.
 - 20.06 Demonstrate proficiency in usage of the NEC codes.
 - 20.07 Demonstrate proficiency in usage of the color codes and configuration.
 - 20.08 Interpret cable substitution hierarchy.
- 21.0 **DEMONSTRATE APPROPRIATE UNDERSTANDING OF BASIC SCIENCE**--The student will be able to:
- 21.01 Demonstrate an understanding of the effects of temperature extremes and moisture content in regards to electronic equipment.
 - 21.02 Demonstrate an understanding of the impact and effects of electrostatic discharge (ESD), power surges, grounding, and lighting strikes.
 - 21.03 Apply the scientific method to draw conclusions or make inferences from data.
 - 21.04 Demonstrate deductive reasoning techniques when troubleshooting
 - 21.05 Demonstrate an understanding of the effects of heat load and ventilation in regards to electronic equipment.
 - 21.06 Identify safety and health related issues including exposure to work related chemicals and hazardous materials, and demonstrate the appropriate precautionary measures.
 - 21.07 Demonstrate an understanding of environmental impact and regulations in regards to the appropriate disposal of electronic equipment.
- 22.0 **DEMONSTRATE PROFICIENCY IN BASIC A.C. CIRCUITS**--The student will be able to:
- 22.01 Identify properties of an AC signal.
 - 22.02 Identify AC sources.
 - 22.03 Analyze and measure AC signals utilizing VOM, DVM.
 - 22.04 Perform AC safety checks.
 - 22.05 Perform AC safety checks.
 - 22.06 Explain high voltage power systems and hazards.
- 23.0 **ANALYZE TECHNICAL DATA ASSOCIATED WITH CABLE VALIDATION AND FAULT LOCATION**--The student will be able to:
- 23.01 Read and understand telecommunications technical data.

- 23.02 Interpret diagrams, schematics.
- 23.03 Document work.

- 24.0 **INSTALL REPAIR TERMINATE AND TEST NETWORK CABLING** - The student will be able to:
 - 24.01 Terminate cable using industry standard configuration termination RJ11, RJ12, RJ45, BNC, and AUI.
 - 24.02 Install cabling using industry standard tools, telepole, and fishtape.
 - 24.03 Punchdown cables on standard wiring blocks. (66 Block, 110 Block)
 - 24.04 Route cable over aerial and buried drops.

- 25.0 **DEMONSTRATE ADVANCED SKILLS IN TEST USAGE TO LOCATE FAULTS**--The student will be able to:
 - 25.01 Operate butt-in test sets.
 - 25.02 Operate toners.
 - 25.03 Operate subscriber line test set.
 - 25.04 Operate cable locator test sets.