

**Florida Department of Education
Student Performance Standards**

Course Title: Telecommunication Technology 1
Course Number: 8730210
Course Credit: 1

Course Description:

This course covers competencies in safety, tools, traffic control, pole climbing, DC circuits, troubleshooting, and customer service.

Abbreviations:

FS-M/LA = Florida Standards for Math/Language Arts
 NGSSS-Sci = Next Generation Sunshine State Standards for Science

Note: This course is pending alignment in the following categories: FS-M/LA and NGSSS-Sci.

| CTE Standards and Benchmarks | FS-M/LA | NGSSS-Sci |
|--|----------------|------------------|
| 04.0 Explain and practice workplace safety--The student will be able to: | | |
| 04.01 Demonstrate office safety. | | |
| 04.02 Demonstrate safety outside of the office. | | |
| 04.03 Explain fiber optics safety. | | |
| 04.04 Demonstrate safety for splicing. | | |
| 04.05 Demonstrate or explain bucket truck safety. (Optional) | | |
| 05.0 Demonstrate basic work practices--The student will be able to: | | |
| 05.01 Demonstrate good work attitudes. | | |
| 05.02 Explain work and business ethics. | | |
| 05.03 Explain general code of conduct. | | |
| 06.0 Demonstrate the use of safety equipment--The student will be able to: | | |
| 06.01 Correctly use personal safety equipment used in the telecommunications industry. | | |

| CTE Standards and Benchmarks | FS-M/LA | NGSSS-Sci |
|---|---------|-----------|
| 06.02 Explain the hazards associated with telecommunications industry. | | |
| 07.0 Inspect tools and equipment--The student will be able to: | | |
| 07.01 Safety, inspect support equipment. | | |
| 07.02 Safety, inspect tools. | | |
| 08.0 Inspect test equipment--The student will be able to: | | |
| 08.01 Evaluate and inspect test equipment. | | |
| 09.0 Explain industry code of conduct--The student will be able to: | | |
| 09.01 Explain the purpose of a code of conduct. | | |
| 09.02 List the basic parts of his/her Industry code of conduct. | | |
| 09.03 Explain how the code of conduct protects both customers and workers. | | |
| 09.04 Explain the relationship between code of conduct and the laws governing privacy of telephone conversations. | | |
| 10.0 Demonstrate traffic control--The student will be able to: | | |
| 10.01 Use roadside signals. (Optional) | | |
| 10.02 Use signage, barricades and cones. (Optional) | | |
| 10.03 Perform flagging, and hand signals. (Optional) | | |
| 10.04 Explain general outside safety procedures. | | |
| 11.0 Demonstrate pole climbing--The student will be able to: | | |
| 11.01 Conduct pole-climbing safety inspection. (Optional) | | |
| 11.02 Use pole-climbing equipment in a safe and correct manner. (Optional) | | |
| 11.03 Explain the hazards of pole climbing. | | |
| 11.04 Demonstrate safe and correct ladder usage. | | |
| 11.05 Select correct ladder for telecommunication work. | | |
| 11.06 Demonstrate ladder rigging for aerial installation. | | |

| CTE Standards and Benchmarks | | FS-M/LA | NGSSS-Sci |
|-------------------------------------|--|----------------|------------------|
| 11.07 | Demonstrate pole climbing to install drops and perform splicing. (Optional) | | |
| 12.0 | Explain roadside safety--The student will be able to: | | |
| 12.01 | Explain the hazards encountered around roadways. | | |
| 12.02 | Work in a safe manner around roadways. (Optional) | | |
| 13.0 | Explain electrical hazards--The student will be able to: | | |
| 13.01 | Identify the hazards associated with work on telecommunication lines and equipment. | | |
| 13.02 | Test and analyze various telecommunications equipment and lines for safety hazards. | | |
| 14.0 | Perform data line safety checks--The student will be able to: | | |
| 14.01 | Check and identify hazardous line currents and voltages. | | |
| 15.0 | Demonstrate proficiency in making electrical connections, splices and basic field repair--The student will be able to: | | |
| 15.01 | Apply proper Occupational Safety Health Administration (OSHA) Safety Standards. | | |
| 15.02 | Make electrical connections. | | |
| 15.03 | Identify and use hand tools properly. | | |
| 15.04 | Identify and use power tools properly. | | |
| 15.05 | Demonstrate acceptable soldering techniques. | | |
| 15.06 | Demonstrate acceptable de-soldering techniques. | | |
| 15.07 | Demonstrate Electrostatic Discharge (ESD) safety procedures. | | |
| 15.08 | Describe the construction of Printed Circuit Boards (PCB's). (Optional) | | |
| 15.09 | Demonstrate rework and repair techniques. (Optional) | | |
| 16.0 | Troubleshoot and repair telecommunication system wiring--The student will be able to: | | |
| 16.01 | Test telecommunication systems and evaluate based on established criteria. | | |
| 16.02 | Identify range of fault conditions for telecommunication systems. | | |
| 16.03 | Demonstrate telecommunication fault identification skills. | | |

| CTE Standards and Benchmarks | FS-M/LA | NGSSS-Sci |
|--|---------|-----------|
| 16.04 Use field documentation techniques for repair of systems. | | |
| 16.05 Use test equipment and logic to locate faults. | | |
| 16.06 Demonstrate proficiency in repair techniques using splices, closure assembly and punch-down terminations. | | |
| 16.07 Validate repaired system to industry criteria. | | |
| 17.0 Demonstrate proficiency in customer relations--The student will be able to: | | |
| 17.01 Describe and demonstrate appropriate personal hygiene and professional attire. | | |
| 17.02 Describe and demonstrate effective listening techniques. | | |
| 17.03 Describe and apply techniques for installing customer confidence and satisfaction. | | |
| 17.04 Describe and apply techniques for keeping the customer informed | | |
| 17.05 Describe and apply effective follow-up techniques. | | |
| 17.06 Demonstrate discretion in interacting with customers in field and retail environments. | | |
| 17.07 Demonstrate an understanding of basic conflict resolution. | | |
| 18.0 Demonstrate proficiency in basic DC 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. | | |

| CTE Standards and Benchmarks | | FS-M/LA | NGSSS-Sci |
|-------------------------------------|--|----------------|------------------|
| 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. | | |

**Florida Department of Education
Student Performance Standards**

Course Title: Telecommunication Technology 2
Course Number: 8730220
Course Credit: 1

Course Description:

This course covers competencies in science, AC circuits, network cabling, and the use of test equipment.

Abbreviations:

FS-M/LA = Florida Standards for Math/Language Arts
 NGSSS-Sci = Next Generation Sunshine State Standards for Science

Note: This course is pending alignment in the following categories: FS-M/LA and NGSSS-Sci.

| CTE Standards and Benchmarks | | FS-M/LA | NGSSS-Sci |
|-------------------------------------|---|----------------|------------------|
| 21.0 | Demonstrate science knowledge and skills--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 lightning 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 AC 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. | | |

| CTE Standards and Benchmarks | | FS-M/LA | NGSSS-Sci |
|-------------------------------------|--|----------------|------------------|
| 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 fish tape. | | |
| 24.03 | Punch down 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 equipment 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. | | |

Florida Department of Education
Student Performance Standards

Course Title: Telecommunication Technology 3
Course Number: 8730230
Course Credit: 1

Course Description:

This course provides competencies in advanced cable repair techniques, test equipment, basic computer architecture, peripheral equipment, and electronic information exchange.

Abbreviations:

FS-M/LA = Florida Standards for Math/Language Arts
 NGSSS-Sci = Next Generation Sunshine State Standards for Science

Note: This course is pending alignment in the following categories: FS-M/LA and NGSSS-Sci.

| CTE Standards and Benchmarks | | FS-M/LA | NGSSS-Sci |
|------------------------------|--|---------|-----------|
| 29.0 | Demonstrate advanced cable repair techniques--The student will be able to: (Optional) | | |
| 29.01 | Prepare buried cable for splicing. | | |
| 29.02 | Splice buried cable. | | |
| 29.03 | Make various closure devices for spliced buried cable. | | |
| 29.04 | Prepare aerial cable for splicing. | | |
| 29.05 | Splice aerial cable. | | |
| 29.06 | Make various closure devices for spliced aerial cable. | | |
| 30.0 | Demonstrate usage of test equipment validate network and telecommunication cabling systems--The student will be able to: | | |
| 30.01 | Validate telephone lines using standard industry procedures. | | |
| 30.02 | Validate high-speed digital lines using industry standard procedures. | | |
| 30.03 | Validate advanced signal lines. (Fiber optics). | | |
| 31.0 | Demonstrate a basic understanding of computer systems architecture--The student will be able to: | | |

| CTE Standards and Benchmarks | FS-M/LA | NGSSS-Sci |
|---|---------|-----------|
| 31.01 Identify network configurations. | | |
| 31.02 Distinguish between faults caused by wiring verses architecture configuration. | | |
| 31.03 Install cable connectors to match architecture. | | |
| 31.04 Explain cable limitations due to architecture. | | |
| 32.0 Demonstrate proficiency in peripheral equipment--The student will be to: | | |
| 32.01 Demonstrate an understanding of input/output devices. | | |
| 32.02 Identify and define serial and parallel interface standards. | | |
| 32.03 Troubleshoot, install and upgrade telecommunications devices and adapter cards. (i.e. NIC, Modem) | | |
| 32.04 Demonstrate professional connector assembly procedures. | | |
| 33.0 Demonstrate proficiency in electronic information exchange--The student will be able to: | | |
| 33.01 Install, connect and maintain network clients to various network operating systems. | | |
| 33.02 Connect and configure computers for network connectivity. | | |
| 33.03 Describe use and system maintenance of a WAN and telecommunications system. | | |
| 33.04 Demonstrate knowledge of network protocols. | | |
| 33.05 Demonstrate knowledge of fundamentals of an Internet system. | | |
| 33.06 Demonstrate knowledge of telecommunications services and standards. | | |

**Florida Department of Education
Student Performance Standards**

Course Title: Telecommunication Technology 4
Course Number: 8730240
Course Credit: 1

Course Description:

This course covers competencies in site requirements, the use of tables and charts, worksite plans, and twisted pair design.

Abbreviations:

FS-M/LA = Florida Standards for Math/Language Arts
 NGSSS-Sci = Next Generation Sunshine State Standards for Science

Note: This course is pending alignment in the following categories: FS-M/LA and NGSSS-Sci.

| CTE Standards and Benchmarks | | FS-M/LA | NGSSS-Sci |
|-------------------------------------|---|----------------|------------------|
| 34.0 | Demonstrate proficiency in site requirements and considerations--The student will be able to: | | |
| 34.01 | Demonstrate knowledge of data communication test equipment. | | |
| 34.02 | Demonstrate knowledge of telecommunication wiring systems. | | |
| 34.03 | Demonstrate knowledge of cable and LAN topology. | | |
| 34.04 | Demonstrate knowledge of hubs, switches and routers. | | |
| 34.05 | Calculate and determine power requirements. | | |
| 34.06 | Calculate and determine requirements of the working environment. | | |
| 34.07 | Install, configure and troubleshoot LAN cable systems (twisted pair, coax, or fiber). | | |
| 34.08 | Configure and troubleshoot patch bay, hubs and transceivers. | | |
| 35.0 | Use tables and charts--The student will be able to: | | |
| 35.01 | Determine expected levels of resistance for wiring configuration. | | |
| 35.02 | Determine changes in resistance due to temperature changes. | | |

| CTE Standards and Benchmarks | FS-M/LA | NGSS-Sci |
|---|---------|----------|
| 35.03 Determine capacitance of a given cable configuration. | | |
| 35.04 Demonstrate quick test methods using Quick Test Charts. | | |
| 36.0 Prepare worksite plans--The student will be able to: | | |
| 36.01 Draw site plans. | | |
| 36.02 Review and evaluate and plan for site electrical considerations. | | |
| 36.03 Draw cable runs (cutsheet). | | |
| 36.04 Evaluate and select wiring room. | | |
| 37.0 Demonstrate proficiency in twisted pair design--The student will be able to: | | |
| 37.01 Select correct cable for CAT5 installations. | | |
| 37.02 Ensure cable rating at patch panels conforms to industry standards. | | |
| 37.03 Test installed design to meet standards using test equipment. | | |