

Bossier Parish Community College
Master Syllabus

Course Prefix and Number: CTEC 127

Credit Hours: 3-1-2

Course Title: Fiber Optics III

Course Prerequisites: CTEC 125

Textbook(s): None – online resources available through Fiber Optic Association’s online learning platform (Fiber U).

Course Description: this course focuses on the installation of fiber optic cable related to FTTx, PON, and WDM networks as well as outside plant (OSP). It is intended for technicians involved in the design, installation, and/or testing of fiber networks. This course is mapped to the CFOS/O (Certified Fiber Optic Specialist, Outside Plant Installation) certification and the CFOS/H (Certified Fiber Optic Specialist, Fiber to the Home/Premises/Curb/Node) certification by The Fiber Optic Association.

Learning Outcomes:

At the end of this course, the student will:

- A. explain outside plant (OSP) in terms to installations, communication systems, components, constructions, and restoration
- B. explain FTTx networks in terms of architecture, standards, components, installation, and testing
- C. understand advanced testing, methods, and measurement errors

To achieve the learning outcomes, the student will or will be able to:

(The letter designations at the end of each statement refer to the learning outcome(s).)

- 1. differentiate the uses between conduit, innerduct, cable pullers, pulling eyes, lubricants (A)
- 2. describe the process of fitting splices in trays, trays in closures, sealing, and pressure testing (A)
- 3. explain installation in regards to poles and racking cables (A)
- 4. explain fiber characterization in regards to testing and troubleshooting (A)
- 5. explain fiber optic network design in terms of aerial, direct buried, pulled in conduit, submarine and other installations (A)
- 6. identify different techniques for construction of fiber optic network (outside plant (OSP), underground or aerial) and premises (A)
- 7. identify installation tools and equipment: cable pullers, plows, bucket trucks, splicing trailers, and directional boring (A)
- 8. describe general installation using ladders, bucket trucks, climbing poles and towers for aerial installation (A)
- 9. Describe grounding in terms of cables with metallic armor, enclosures, hardware on poles, and distribution buildings (A)
- 10. explain FTTx and issues pertaining to FTTx (B)
- 11. identify the types of FTTx (FTTC (curb, also sometimes FTTN for node),

- FTTH (home), FTTP (premises), etc. (B)
12. compare the advantages/disadvantages of each type of FTTx (B)
 13. compare and contrast the different types of FTTH architectures (active/P2P, PON) (B)
 14. list the advantages/disadvantages of different types of FTTH architectures (B)
 15. list the differences between PONs and traditional fiber networks (B)
 16. differentiate standardized PON network types (BPON, GPON, EPON, RFOG) (B)
 17. explain the future developments in PONs (B)
 18. describe PON network cabling architectures (B)
 19. describe cabling for single family and MDU (multi-dwelling) installations (B)
 20. describe PON cabling options (traditional fiber, prefab components, special components developed for PONs) (B)
 21. test PONs (OLTS and OTDR) (B)
 22. explain insertion loss (C)
 23. explain fiber attenuation, splice loss, connector reflectance by OLTS and OTDR (C)
 24. explain spectral attenuation (SA) (C)
 25. describe fiber dispersion for long distance, high-speed links, chromatic dispersion (C) and polarization mode dispersion (PMD) (C)
 26. discuss various troubleshooting processes for fiber optic testing (C)
 27. describe the standards for testing (C)
 28. explain the causes of CD, PMD, and SA (C)
 29. provide specifications and maximum tolerated dispersion by various networks (C)
 30. explain test methods related to CD, PMD, and SA (C)
 31. explain compensating for CD (C)
 32. explain variability of PMD testing (C)

Course Requirements:

- To pass the course, student must achieve a course average of 70% or above.
- Students must have access to a computer (not mobile device), Microsoft Office, and the Internet to complete the assignments. Computer, software, and the Internet are available to students on campus during scheduled computer lab times and in the Learning Commons located in the BPCCLibrary.
- Students are required to use BPCCL's LMS and are encouraged to use the BPCCLibrary to research topics and employment opportunities.

Course Grading Scale:

- A = 90 - 100
- B = 80 - 89
- C = 70 - 79
- D = 60 - 69
- F = 0 - 59

Attendance Policy:

Each student is expected to attend class regularly; excessive unexcused absences constitute grounds for suspension. Refer to the student handbook for [Attendance Policy](#).

Course Fees: This course is accompanied with an additional non-refundable fee for supplemental materials, laboratory supplies, software licenses, certification exams and/or clinical fees.

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