NOVA COLLEGE-WIDE COURSE CONTENT SUMMARY
ELE 250 – FIBER OPTICS TECHNOLOGY (3CR)

Course Description

Introduces testing, troubleshooting, and repair of fiber optic systems. Prepares students for the Electronics Technician Association Fiber Optics Technician (FOT) certification necessary to compete for technician level positions in a wide range of networking, security and video companies. Lecture 2 hours. Laboratory 3 hours. Total 5 hours per week.

General Course Purpose

This course is designed to teach students the basic concepts of fiber optics technology, such as introduction to fiber optics, history of fiber optics, single-mode vs multi-mode, light sources, inside vs outside plant concepts, losses in fiber, and power measurement. Using state of the art equipment, this course will teach students important hands-on concepts such as connectors using corning kits, splicing using fusion splicers, and power measurement using Fluke Networks equipment. Students will also learn the use of OTDR and proper fiber cleaning methods.

Course Prerequisites/Corequisites

Prerequisite: ELE 150

Course Objectives

At the completion of the course, the student will be able to:

- Explain fiber optic principles.
- Discuss reflection, refraction, and scattering as it applies to fiber optics communication.
- Evaluate the use of different types of fiber optic cables for communication.
- Apprise the efficiency of fiber optic light source.
- Contrast the use of single and multi-mode fibers in communication.
- Calculate the loss in fiber optics, input and output power, gain, and attenuation.
- Apply Snell's Law to calculate the critical angle of incidence and time delay at the output.
- Calculate the total macrobending loss in a single-mode fiber-optic cable and a multimode fiber-optic cable.
- Use Fluke Networks equipment to measure single-mode and multimode power.
- Categorize the different types of connectors and evaluate connector endface polishing, cleaning, and geometry.
- Describe the tools and methods used to splice optical fibers.
- Demonstrate the importance of proper splicing using a fusion splicer.
- Calculate the potential splice loss from a core diameter mismatch.
- Explain the use of optic transmitters and receivers in analog communication.
- Describe a basic approach to fiber optic trouble shooting.

Major Topics to be Included

- Introduction and History
- Reflection, Refraction, Scattering
- Indoor vs Outdoor Cables
- Loss in Fiber optic system
- Single Mode vs Multimode complete discussion
- Power measurement

- OTDR
- Fiber optic transmitters and receivers
- Connectors and connectors practice
- Splicing and Splicing practice
- Fiber optic Troubleshooting
- Review and certification discussion