

- I. COURSE DESCRIPTION:** Optical fiber systems are by far the most stable and interference-free transmission medium available. Fiber optics became a near automatic choice for transmission of data, digitized voice and picture. Industrial applications are also emerging. This course is taught at the technology level and treats the application of optical fibers and the functioning of various system components. A knowledge of AC and DC circuits and digital electronics is assumed.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

Upon successful completion of this course, the student will demonstrate the ability to:

1. Recall a short history of fiber optic technology and use the terminology of this field.

Potential Elements of the Performance:

- Draw a sketch of a basic fiber optic link.
 - Describe the meaning of the terms bandwidth, bit rate and fiber loss.
 - List the advantages and disadvantages of fiber optics.
 - Name various applications of fiber optics.
2. Understand the basic principle of light

Potential Elements of the Performance:

- Explain the propagation of light as a wave and understand light as a particle
 - Calculate the wavelength of a light beam and the energy of a photon.
 - Use Snell's law of reflection and refraction.
 - Calculate the critical angle and the numerical aperture of an optical fiber.
 - Describe the meaning of single mode, multi-mode, step index and graded index optical fiber.
3. Understand the operation of the components of a fiber optic system.

Potential Elements of the Performance:

- Recall methods of fiber fabrication and cable design.

- Explain modal dispersion, material dispersion and dB loss.
 - Characterize optical sources, photodetectors, connectors, splices and couplers.
 - Explain the differences between LEDs and Lasers.
4. Display familiarity with system architecture and different types of networks.

Potential Elements of the Performance:

- Understand Patch Panels, Local Area Networks and network layers.
 - Explain Star Network, Ring Network and Bus Network topologies.
 - Understand IEEE Ethernet and Token Ring standards.
5. Install, handle and test Fiber Optic Systems
- Potential Elements of the Performance:
- Operate an optical power meter
 - Measure fiber loss
 - Understand Optical Time Domain Reflectometry.
 - Polish and splice optical fiber.

III. TOPICS:

1. History of fiber optic cable technology.
2. The basic principles of light
3. Types and parameters of optical fibers
4. Modulation, Systems and Networks
5. Installation, testing and safety.

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

1. Course handouts and worksheets provided by the teacher
2. Laboratory handouts and electronic parts are available in the laboratory.

V. EVALUATION PROCESS/GRADING SYSTEM:

The following semester grades will be assigned to students in postsecondary courses:

<u>Grade</u>	<u>Definition</u>	<u>Grade Point Equivalent</u>
A+	90 - 100%	4.00
A	80 - 89%	3.75
B	70 - 79%	3.00
C	60 - 69%	2.00
R (Repeat)	59% or below	0.00
CR (Credit)	Credit for diploma requirements has been awarded.	
S	Satisfactory achievement in field placement or non-graded subject areas.	
X	A temporary grade. This is used in limited situations with extenuating circumstances giving a student additional time to complete the requirements for a course (see <i>Policies & Procedures Manual – Deferred Grades and Make-up</i>).	
NR	Grade not reported to Registrar's office. This is used to facilitate transcript preparation when, for extenuating circumstances, it has been impossible for the faculty member to report grades.	

VI. SPECIAL NOTES:

Special Needs:

If you are a student with special needs (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with your instructor and/or the Special Needs office. Visit Room E1204 or call Extension 493, 717, or 491 so that support services can be arranged for you.

Retention of course outlines:

It is the responsibility of the student to retain all course outlines for possible future use in acquiring advanced standing at other postsecondary institutions.

Plagiarism

Students should refer to the definition of “academic dishonesty” in *Student Rights and Responsibilities*. Students who engage in “academic dishonesty” will receive an automatic failure for that submission and/or such other penalty, up to and including expulsion from the course, as may be decided by the professor. In order to protect students from inadvertent plagiarism, to protect the copyright of the material referenced, and to credit the author of the material, it is the policy of the department to employ a documentation format for referencing source material.

The Professor reserves the right to change the information contained in this course outline depending on the needs of the learner and the availability of resources.

Substitute course information is available in the Registrar's office.

Upgrading:

- If a test is missed for reasons whatsoever, the grade for that test is 0, unless a credible reason is given for the absence.
- No upgrading tests will take place during the semester. All rewrites will be scheduled during the last week of the semester.
- In the case of final marks less than 60% but greater than 55%, provided an 80% or better attendance record, consideration will be given to a supplemental examination covering the whole course.
- Attendance for laboratory classes is compulsory. Attendance for all theory classes is highly recommended and recorded, but not mandatory.

VII. PRIOR LEARNING ASSESSMENT:

Students who wish to apply for advanced credit in the course should consult the instructor. Credit for prior learning will be given upon successful completion of the following:

VIII. DIRECT CREDIT TRANSFERS:

Students who wish to apply for direct credit transfer (advanced standing) should obtain a direct credit transfer form from the Dean's secretary. Students will be required to provide a transcript and course outline related to the course in question.