

I. COURSE DESCRIPTION:

This course is offered to Electrical Automation Technologist students. After an introductory chapter about the general concepts of telecommunications, the dial-up telephone system will be presented and explained. Modem theory, coding, data formats and Fiber Optics will be treated in fair detail. Specific integrated circuits used in data communication will be introduced and examined in the laboratory. The topic of Spectrum Analysis will be as it relates to Data Communication will be covered in depth.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

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

1. *Understand the Public Switched Telephone System and Data Communications procedures, over a band limited analog system.*

Potential Elements of the Performance:

- Recall and explain the structure of the Telephone Network.
- Recall the concepts of Time Division and Frequency Division multiplexing .
- Familiarity with Data Communications concepts and standards.

2. *Know the structure of The Seven Layer OSI architecture*

Potential Elements of the Performance:

- Understand the Physical Layer protocols.
- Be familiar with the structure of standard computer serial ports
- Recall the principles of Limited Distance Data Communications.

3. *Utilize Telephone modems*

Potential Elements of the Performance:

- Be familiar with modulation techniques
- Recognize standard Low Speed and High speed modems
- Know the spectral utilization of dial up and leased lines.
- Interpret Shannon's law.

4. *Understand the principles and applications of Fiber Optics in Data Communications*

Potential Elements of the Performance:

- Know the basic terminology of F/O
- Recall the structure of Single mode and Multimode Optical Fiber
- Understand the principles of F/O light sources photo-detectors

III. TOPICS:

1. Introduction to Communications Systems
2. Seven Layer OSI architecture
3. Telephone Modems
4. Fiber Optics
5. Fourier analysis with numerical methods

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

Study material in PDF format is available from the teacher.

Necessary software: Hyperterminal and MathCad. Both are available in the laboratory.

V. EVALUATION PROCESS/GRADING SYSTEM:

There will be three theory tests with a weight of 70% of the final grade. The grading of laboratory type objectives will be in two parts: The demonstrated ability to perform a skill function, e.g. use an instrument in a specified role or test a circuit, will be graded "C". Subjective evaluation of lab reports, supporting theory, deportment, housekeeping etc. will be used to modify the skill function grade upward, where applicable. The grading weight will be 30% for the laboratory. Both theory and laboratory work must be passed independently for a passing grade.

| The following semester grades will be assigned to students in all credit courses. | | | |
|---|--------------|--|-------------------------------|
| | Grade | Definition | Grade Point Equivalent |
| | A+ | 90 – 100% | 4.00 |
| | A | 80 – 89% | |
| | B | 70 - 79% | 3.00 |
| | C | 60 - 69% | 2.00 |
| | D | 50 – 59% | 1.00 |
| | F (Fail) | 49% and below | 0.00 |
| | | | |
| | CR (Credit) | Credit for diploma requirements has been awarded. | |
| | S | Satisfactory achievement in field /clinical placement or non-graded subject area. | |
| | U | Unsatisfactory achievement in field/clinical placement or non-graded subject area. | |
| | X | A temporary grade limited to situations with extenuating circumstances giving a student additional time to complete the requirements for a course. | |
| | NR | Grade not reported to Registrar's office. | |
| | W | Student has withdrawn from the course without academic penalty. | |

VI. SPECIAL NOTES:

Attendance:

Sault College is committed to student success. There is a direct correlation between academic performance and class attendance; therefore, for the benefit of all its constituents, all students are encouraged to attend all of their scheduled learning and evaluation sessions. This implies arriving on time and remaining for the duration of the scheduled session.

VII. COURSE OUTLINE ADDENDUM:

The provisions contained in the addendum located on the portal form part of this course outline.