

**SAULT COLLEGE OF APPLIED ARTS AND TECHNOLOGY**

**SAULT STE. MARIE, ONTARIO**



Sault College

**COURSE OUTLINE**

**COURSE TITLE:** Data Communications

**CODE NO. :** ELN-317

**SEMESTER:** 5

**PROGRAM:** Electrical Technology

**AUTHOR:** Peter Szilagyi

**DATE:** October 12  
2009

**PREVIOUS OUTLINE DATED:** Sep. 04,  
2008

**APPROVED:**

*“Corey Meunier”*  
**CHAIR**

\_\_\_\_\_  
**DATE**

**TOTAL CREDITS:** 4

**PREREQUISITE(S):** MTH-551

**HOURS/WEEK:** 4

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*For additional information, please contact Corey Meunier, Chair*  
*School of The Natural Environment, Technology & Skilled Trades*  
*(705) 759-2554, Ext. 2610*

**I. COURSE DESCRIPTION:**

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 theory in this course is based on Spectrum Analysis, and that topic will be reviewed.

**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 .
- Gain 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.

**5. *Learn Weaveform Analysis Techniques***Potential Elements of the Performance:

- Perform standard Fourier Analysis procedures for waveforms encountered in Data Communications equipment.
- Operate a Computer Sound Card based Spectrum Analyzer.

**6. *Perform Laboratory Experiments***Potential Elements of the Performance:

- Learn how to use a Terminal program.
- Build Null Modems and Loop-Back testers.
- Build Fiber Optic data transceivers.

**III. TOPICS:**

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

**IV. REQUIRED RESOURCES/TEXTS/MATERIALS:**

The textbook for this course is written by professor Peter Szilagyi and it is reproduced in-house. It is sold in the Campus Book Store

A Parts Kit for the Laboratory component of the course is also sold in the Campus Book Store.

A pdf copy of the study materials, all laboratory experiments and other timely handouts will be posted on the Student Data Files server, available for down-loads.

## V. EVALUATION PROCESS/GRADING SYSTEM:

There will be three written tests, with a total weight of 70% of the final grade. The weight of the laboratory activity is 30%.

Attendance of all theory lectures is highly recommended. Attendance of all laboratory activities is compulsory.

The following semester grades will be assigned to students:

<b>Grade</b>	<b>Definition</b>	<i>Grade Point Equivalent</i>
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:

### Course Outline Amendments:

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.

### 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.

Prior Learning Assessment:

Students who wish to apply for advance credit transfer (advanced standing) should obtain an Application for Advance Credit from the program coordinator (or the course coordinator regarding a general education transfer request) or academic assistant. Students will be required to provide an unofficial transcript and course outline related to the course in question. Please refer to the Student Academic Calendar of Events for the deadline date by which application must be made for advance standing.

Credit for prior learning will also be given upon successful completion of a challenge exam or portfolio.

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

Disability Services:

If you are a student with a disability (e.g. physical limitations, visual impairments, hearing impairments, or learning disabilities), you are encouraged to discuss required accommodations with your professor and/or the Disability Services office. Visit Room E1101 or call Extension 2703 so that support services can be arranged for you.

Communication:

The College considers **WebCT/LMS** as the primary channel of communication for each course. Regularly checking this software platform is critical as it will keep you directly connected with faculty and current course information. Success in this course may be directly related to your willingness to take advantage of the **Learning Management System** communication tool.

Plagiarism:

Students should refer to the definition of “academic dishonesty” in *Student Code of Conduct*. A professor/instructor may assign a sanction as defined below, or make recommendations to the Academic Chair for disposition of the matter. The professor/instructor may (i) issue a verbal reprimand, (ii) make an assignment of a lower grade with explanation, (iii) require additional academic assignments and issue a lower grade upon completion to the maximum grade “C”, (iv) make an automatic assignment of a failing grade, (v) recommend to the Chair dismissal from the course with the assignment of a failing grade. 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.

Student Portal:

The Sault College portal allows you to view all your student information in one place. **mysaultcollege** gives you personalized access to online resources seven days a week from your home or school computer. Single log-in access allows you to see your personal and financial information, timetable, grades, records of achievement, unofficial transcript, and outstanding obligations, in addition to announcements, news, academic calendar of events, class cancellations, your learning management system (LMS), and much more. Go to <https://my.saultcollege.ca>.

Electronic Devices in the Classroom:

Students who wish to use electronic devices in the classroom will seek permission of the faculty member before proceeding to record instruction. With the exception of issues related to accommodations of disability, the decision to approve or refuse the request is the responsibility of the faculty member. Recorded classroom instruction will be used only for personal use and will not be used for any other purpose. Recorded classroom instruction will be destroyed at the end of the course. To ensure this, the student is required to return all copies of recorded material to the faculty member by the last day of class in the semester. Where the use of an electronic device has been approved, the student agrees that materials recorded are for his/her use only, are not for distribution, and are the sole property of the College.

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.

***It is the departmental policy that once the classroom door has enclosed, the learning process has begun. Late arrivers will not be granted admission to the room.***