



**I. COURSE DESCRIPTION:**

This course is a study of modern analog and digital devices and circuits. The student will study electronic devices, digital numbering systems, Boolean algebra, common digital integrated circuits, as well as other pulse shaping / generating and switching circuits. Emphasis will be placed on the analysis and application of these devices and circuits in the Aviation Industry. Rounding out the course is an Avionics component covering the flight instruments and electronic circuits which produce, transmit and condition analog and digital signals including transmitting / receiving systems.

**II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:**

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

**1. *Understand the characteristics and operation of basic semiconductor devices ( Diode, Zener, LED, LCD and Light Detecting Diodes)***

Potential Elements of the Performance:

- Describe the operation of single PN junction devices
- Describe basic electrical characteristics of these devices

**2. *Understand the application of basic semiconductor devices ( Diode, Zener, LED, LCD and Light Detecting Diodes)***

Potential Elements of the Performance:

- Describe the operation of various rectifiers.
- Describe the operation of zener voltage regulators
- Calculate quantities associated with rectification / voltage regulation.

**3. *Understand the characteristics and operation of Bi-Polar Junction Transistors ( BJT's ).***

Potential Elements of the Performance:

- Describe the operation of PNP and NPN Transistors.
- Describe basic electrical characteristics of Transistors

**4. *Understand the application of Transistors in Switching and Amplifier Circuits.***

Potential Elements of the Performance:

- Describe the operation of a basic transistor switch circuit.
- Calculate quantities associated with the operation of a transistor switch.
- Describe the operation of a BJT Amplifier
- Calculate quantities associated with the operation of various

Biasing Methods.

**5. *Understand the operation of basic Digital Integrated Circuit functions.***

Potential Elements of the Performance:

- Describe the difference between Analog and Digital
- Understand various Digital Numbering Systems, and be able to convert between Decimal, Binary, Octal, Hexadecimal and ASCII.
- Describe the operation of basic digital functions Algebraically (Boolean), with a Truth Table and Descriptively.

**6. *Understand the operation of basic RF Communication Circuits / Systems***

Potential Elements of the Performance:

- Understand the Radio Frequency Spectrum as prescribed by D.O.C. and F.C.C.
- Describe the theory / concepts of Radio Frequency communication  
( Transmission / Reception )
- Describe basic RF modulation techniques ( AM / FM )
- Describe the principles of Antennas and RF Wave propagation.
- Describe the major components of an aircraft communication system.

**III. TOPICS:**

1. Electronic Semiconductor Devices and Applications
2. Digital Electronics
3. Avionics and RF Communication Systems
4. Other Devices and Transducers \*\* (as time permits)

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

Textbook used in ELR104, will serve as a reference,  
Electronics a Complete Course, by Cook, 2<sup>nd</sup> Ed. , PH Pub.  
Handouts will be supplied by the Instructor.

Students will be expected to use Internet Resources & the LMS as indicated.

**V. EVALUATION PROCESS/GRADING SYSTEM:**

The final grade will be derived as follows;

3 Theory Tests – each worth 33.3%  
 Surprise Quizzes – worth 5% max can be given at anytime, with the  
 percentage weighting attributed toward the next major test.

The following semester grades will be assigned to students:

<b>Grade</b>	<b><u>Definition</u></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 been closed on the half-hour, the learning process has begun. Late arrivals will not be granted admission to the room.***

## NOTE:

- Your attendance and attention in all classes, and your final grade are directly related. A deduction of 1% per theory hour missed will be imposed. (including double periods)
- Any student that is absent for a test, will be required to provide a doctors' note immediately upon returning. Failing to do so will result in a grade of 0% being assigned to the missed test.
- There will be no rewrites for any test written.
- Tests, quizzes and other activities will not be scheduled on an individual basis, unless it is for a medical or family emergency.
- Disruptions to theory classes, such as lateness, are not acceptable and will be dealt with on an individual basis.

***All required submissions must be in a Duo-Tang cover***

All required submissions will be assessed a late penalty of ***5% per day*** (Weekends included, submit to Security at 2712).