

I. COURSE DESCRIPTION:

An introductory course designed to give an overview of terms, devices, symbols and analysis techniques used in DC circuits. Topics include series, parallel and series-parallel DC circuit analysis. Other topics include an introduction to magnetism and magnetic devices, inductors and capacitors and their principle operation in DC circuits. An introduction to AC circuits, phasor diagrams and RLC circuit analysis basics completes the course.

II. LEARNING OUTCOMES AND ELEMENTS OF THE PERFORMANCE:

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

1. Analyse Series, Parallel and Series-Parallel DC circuits containing voltage and current sources and resistors, to determine individual voltage, current and power values.

Potential Elements of the Performance:

- Complete mathematical questions from text and assignments
- Choice and use of network Theorems to aid in analysis
- Completion of test

2. Analyse magnetic properties of circuits and devices.

Potential Elements of the Performance:

- Determine the direction of magnetic flux present as a result of DC current flow in a conductor. Determine the direction of magnetic flux present as a result of DC current flow in a coil
- Determine the direction of rotation of a simple dc motor
- Determine the direction of current flow in a simple dc generator
- Completion of dc machine diagrams showing flux fields, main fields and rotation
- Complete test questions

3. Analyse a DC circuit containing inductors or capacitors and resistors, to determine charge and discharge characteristic values.

Potential Elements of the Performance:

- Completion of RL and RC circuit questions regarding time constants
- Completion of RL and RC circuit questions requiring the solution of the time for threshold voltage or current achievement
- Completion of test

- Analyse an AC circuit containing inductors and capacitors, to determine total impedance, current, phase angles and power factor.

Potential Elements of the Performance:

- Completion of AC sine wave characteristics questions
- Completion of impedance calculations in AC circuits
- Current and voltage phase angle calculations
- Power factor correction questions in parallel AC circuits

III. TOPICS:

1. Definition of voltage, current, resistance, sources, symbols
2. Ohm's Law
3. Series Circuits, Kirchhoff's Laws, Real vs. Ideal Circuits
4. Energy and Power, Efficiency
5. Parallel Circuits, Conductance
6. Series-Parallel Circuits
7. Circuit Theorems, Thevenin's, Max Power Transfer, Superposition
8. Magnetic materials and circuits, Right Hand Rule, Motor/Generator Action
9. Inductors, Series and Parallel, Mutual Inductance, energy storage, Transformer Introduction
10. Capacitors, Series and Parallel, energy stored
11. Inductor-Resistor Circuits, Time Constants, Instantaneous Values of Current and Voltage, Back emf
12. Capacitor-Resistor Circuits, Time Constants, Instantaneous Values of Current and Voltage, Back emf
13. AC fundamentals
14. RLC circuits, phasors and power factor correction

IV. REQUIRED RESOURCES/TEXTS/MATERIALS:

Electronics: A Complete Course; 2nd ed. ; by Nigel P. Cook; Prentice Hall; ISBN: 0-13-111066-7

V. EVALUATION PROCESS/GRADING SYSTEM:

Final grade will be awarded based on the composite score of assignments, quizzes, and tests as follows:

Three Tests	75%
Quizzes	10%
<u>Assignments and Attendance</u>	<u>15%</u>
Total	100%

(The percentages shown above may have to be adjusted to accurately evaluate student skills. Students will be notified of any changes made.)

The professor reserves the right to adjust the mark up or down 5% based on attendance, participation, leadership, creativity and whether there is an improving trend.

NOTES: If a student misses a test or surprise quiz without contacting the instructor, the Dean's office or the switchboard prior to the test or quiz, a mark of zero will be granted without a re-write option.

A minimum of 80% attendance required in the lectures.

- Makeup Tests are at the discretion of the instructor and will be assigned a maximum grade of 50%.
- The professor reserves the right to adjust the number of tests, practical tests and quizzes based on unforeseen circumstances. The students will be given sufficient notice to any changes and the reasons thereof.
- A student who is absent for 3 or more times without any valid reason or effort to resolve the problem will result in action taken.

NOTE: If action is to be taken, it will range from marks being deducted to a maximum of removal from the course.

The following semester grades will be assigned to students:

<u>Grade</u>	<u>Definition</u>	<u>Grade Point Equivalent</u>
A+	90 – 100%	4.00
A	80 – 89%	3.00
B	70 - 79%	2.00
C	60 - 69%	1.00
D	50 – 59%	0.00
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.

The professor reserves the right to use other tools and/or techniques that may be more applicable. These other tools and/or techniques for effective communication will be discussed, identified and presented throughout the delivery of the course content.

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. Announcements, news, the academic calendar of events, class cancellations, your learning management system (LMS), and much more are also accessible through the student portal. 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 enclosed, the learning process has begun. Late arrivers will not be granted admission to the room.*

Tuition Default:

Students who have defaulted on the payment of tuition (tuition has not been paid in full, payments were not deferred or payment plan not honoured) as of the first week of *March* will be removed from placement and clinical activities. This may result in loss of mandatory hours or incomplete course work. Sault College will not be responsible for incomplete hours or outcomes that are not achieved or any other academic requirement not met as of the result of tuition default. Students are encouraged to communicate with Financial Services with regard to the status of their tuition prior to this deadline to ensure that their financial status does not interfere with academic progress.