



**I. COURSE DESCRIPTION:**

An analytical study of series and parallel, and series-parallel AC circuits, impedance networks, network theorems and poly-phase circuits. Fundamentals of DC circuit analysis in RC circuits is followed by AC analysis techniques in RL, RC and RLC circuits. An overview of the basic construction and operation of AC machines and transformers completes the course content.

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

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

**1. Analyse a DC circuit containing capacitors and resistors, to determine charge and discharge characteristics**Potential Elements of the Performance:

- Completion of RC cct questions regarding time constants
- Completion of RC cct questions requiring the solution of the time for threshold voltage or current level achievement
- Completion of test

**2. Determine the impedance and operation of single-phase AC circuits using phasors and complex math.**Potential Elements of the Performance:

- Completion of complex math questions including the j operator
- Completion of basic trigonometry questions
- Completion of polar and rectangular conversions
- Analysis of single-phase circuit operation using complex math, to find impedance(s), voltage and current values
- Complete formal test

**3. Analyse a three-phase cct with respect to type (Delta or Wye) and solve for both line and phase voltages and currents.**Potential Elements of the Performance:

- Completion of three-phase cct questions regarding line and phase values
- Completion of three-phase cct questions having combinations of delta and wye generators and impedance loads
- Completion of three-phase transformer connections and values
- Analysis of ideal vs real transformer model calculations, including no-load vs full-load phasor diagrams using R, L and C loads
- Investigate the characteristics of 3-phase synchronous AC generators

- Completion of test

### **III. TOPICS:**

1. Capacitance
2. RC , DC Circuits
3. AC fundamentals (review)
4. Phasors & Complex Numbers
5. RL , RC & RLC AC Circuits, Resonance & Filters
6. Series-Parallel AC Circuits
7. Power in AC Circuits
8. AC Networks
9. Three-Phase AC Systems
10. Transformers
11. Three-Phase AC Generators

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

Principles of Electric Circuits , 9<sup>th</sup> Ed. , by Floyd

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

**Three Tests @ 33 % each + Review Assignment @ 1% : TOTAL  
100%**

**NOTES:** If a student misses a test or surprise quiz (maximum 5% of final grade) 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.

**Surprise Quiz's may be given for a maximum of 5% of the final grade and are attributed toward the next test percentage value.**

**No rewrites are given for any test attempted.**

<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 closed, the learning process has begun. Late arrivals will not be granted admission to the room.***