



**I. COURSE DESCRIPTION:**

This lab-based course runs concurrently with and supports theory covered in Electrical Theory, Level II. Students will connect and test direct current (DC) motors and generators, single phase and three phase squirrel cage induction motors and associated control circuitry. Alternating current RLC circuits will also be tested in the lab.

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

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

**1. *Connect and test various DC machine configurations.***Potential Elements of the Performance

- Identify the mechanical parts, windings and wiring connections of DC machines.
- Draw schematics and demonstrate wiring, starting, and control methods of series, shunt and compound DC motors.
- Demonstrate methods for forward-reverse control of DC motors.
- Explain and demonstrate reduced voltage starting techniques for DC motors.
- Demonstrate dynamic braking to illustrate principles of Counter Electromotive Force
- Use voltmeters and ammeters to determine torque and load characteristics of DC machines.

**III. TOPICS:**

1. Direct Current Machines
2. Single Phase and Three Phase Squirrel Cage Induction Motor
3. Motor Control
4. RLC Circuits

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

*Ontario Electrical Safety Code current version*

**REFERENCES:**

Industrial Motor Control (Lab Manual) by Herman  
ISBN 0-8273-8642-7

Industrial Motor Control (Text) by Herman & Alerich  
ISBN 0-8273-8640-0

Electric Motor Control by Herman & Alerich  
ISBN 0-7668-6164-3

Safety glasses, rubber insulating gloves with leather protectors and hand tools are required.

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

**Lab Reports:** **80%**  
**Tests (1 or 2 practical or theory tests as time permits)** **20%**

- The professor reserves the right to adjust the number of tests as warranted. Any modifications will be discussed in class.
- Attendance is mandatory and quizzes will only be marked when completed in class.
- Tests will not be returned but will be available for review.

**\*See special notes.**

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%	
A	80 – 89%	4.00
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.

If a faculty member determines that a student is at risk of not being successful in their academic pursuits and has exhausted all strategies available to faculty, student contact information may be confidentially provided to Student Services in an effort to offer even more assistance with options for success. Any student wishing to restrict the sharing of such information should make their wishes known to the coordinator or faculty member.

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

If a student misses a test he/she must have a valid reason (i.e. medical or family emergency – documentation may be required). In addition, the instructor must be notified prior to the test sitting. If this procedure is not followed the student will receive a mark of zero on the test with no make-up option.

If a student misses class time due to sickness, family emergency or other reason beyond his/her control the student must at his/her first opportunity meet with the course faculty to discuss if the missed time has placed the student at an increased risk of failing. The student must follow up the meeting by emailing the faculty with a summary of the meeting's discussions. Documentation validating the missed time may be required.

Any material covered during any absence legitimate or not is the responsibility of the student.

There are no make-up tests, assignments or extra work allowed for any reason.

Any material covered during any absence legitimate or not is the responsibility of the student.

Deadlines will be specified for submission of assignments for grading. Late assignments will not be accepted and a grade of 0 will be assigned.

Use of cell phones/PDAs for any form of communication (voice, text...) during class or lab time is strictly prohibited. **Cell phones/PDAs must be silenced during regular class and lab times and must be turned off and kept out of sight during test sittings. Failure to follow the latter requirement during a test sitting will result in a grade of 0 being assigned.**

Students may not wear earphones of any kind during lab activities or test sittings. This does not include hearing aids required for the hearing impaired.

Required texts are brought to each class. Sections of the course text books may be highlighted however they are not to be written in. Tests will be 'open book' as far as the textbooks are concerned. However, use of a book containing markings other than the aforementioned highlights is not permitted and will be considered as academic dishonesty. Students are responsible for supplying their own texts for tests. Sharing books during a test is not permitted.

## VII. COURSE OUTLINE ADDENDUM:

The provisions contained in the addendum located in D2L and on the portal form part of this course outline.