

COURSE SYLLABUS



COURSE TITLE: ECET-149
CLASS SECTION: X01
TERM: 2022-W
COURSE CREDITS: 3
DELIVERY METHOD(S):

Camosun College campuses are located on the traditional territories of the Ləkʷəŋən and W̱SÁNEĆ peoples. We acknowledge their welcome and graciousness to the students who seek knowledge here. Learn more about Camosun's [Territorial Acknowledgement](#).

For COVID-19 information please visit <https://camosun.ca/about/covid-19-updates>

Camosun College requires mandatory attendance for the first class meeting of each course. If you do not attend, and do not provide your instructor with a reasonable explanation in advance, you will be removed from the course and the space offered to the next waitlisted student.

INSTRUCTOR DETAILS

NAME: Lindsay Stretch
EMAIL: stretch@camosun.ca
OFFICE: TEC216
HOURS: By Appointment

As your course instructor, I endeavour to provide an inclusive learning environment. However, if you experience barriers to learning in this course, do not hesitate to discuss them with me. Camosun College is committed to identifying and removing institutional and social barriers that prevent access and impede success.

CALENDAR DESCRIPTION

[INSERT TEXT HERE]

PREREQUISITE(S): "C+" in Pre-calculus 12, or Principles of Math 12; or "C" in MATH 107, or MATH 115, or MATH 173*; or assessment; and Submit proof of a letter grade of "C" or higher in Physics 12, or PHYS 104*.
* These courses are part of the Technology Access Program.

CO-REQUISITE(S):
EXCLUSION(S):

COURSE LEARNING OUTCOMES / OBJECTIVES

Students will be introduced basic electrical theory, practice and devices. Topics include; resistance, capacitance, inductance, D.C. and A.C. circuits, the fundamentals of AC and DC electrical motors, generators, electrical voltage conversion and transmission. An introduction of electricity and magnetism will be provided as well as practice in electrical measurement. Topics covered will be, in part, electromechanical energy conversion, synchronous machines, induction machines, DC machines and special purpose motors, motor selection and speed control techniques.

Upon successful completion of this course a student will be able to:

- Describe Voltage, Current and Resistance
- Calculate and measure the current in circuit made up of a battery and resistors
- Describe Capacitors and Inductors
- Understand the basic principles of the electromechanical energy conversion.
- Explain general principles electric machine operation: DC, AC (single phase, three phase, synchronous, induction)
- Understand the basics of speed control in motors.
- Understand and use transformers for basic voltage conversion
- Be able to identify the voltages and number of phases available to a site based on observations of local transmission lines and electrical entry name plate data.
- Describe methods of producing electricity
- Describe how AC power is produced and distributed to buildings
- Understand the concept and techniques for generation of rotating magnetic field.
- Explain the operation of synchronous machines.
- Explain speed control speed of a synchronous or induction motor using a variable frequency drive.
- Explain basic characteristics of induction motor.
- Select induction motor for different applications (Name plate data: voltage, phases, speed, power)
- Understand problems at motor starting and variable speed operation.
- Understand commutation process in DC machines.
- Identify differences in basic configurations of dc machines working both as generators and motors.
- Select motors for some special applications.

REQUIRED MATERIALS & RECOMMENDED PREPARATION / INFORMATION

(a) Course materials from D2L site

(b) Principles of Electronics (Multicolour) Mehta, Rohit – ebook \$30 at Amazon.ca

https://www.amazon.ca/Principles-Electronics-Multicolour-Mehta-Rohit-ebook/dp/B06XKV3RPX/ref=sr_1_1

(c) Text (Recommended in pdf if available):
Circuit Analysis with Devices: Theory and Practice
Robins and Miller ISBN 1-4018-7984-5

(d) Other (Optional)
Foundations of Electronics, Circuits and Devices 3rd
Edition, Russell L. Meade ISBN 0-7668-0427-5

COURSE SCHEDULE, TOPICS, AND ASSOCIATED PREPARATION / ACTIVITY / EVALUATION

The following schedule and course components are subject to change with reasonable advance notice, as deemed appropriate by the instructor.

WEEK or DATE RANGE	ACTIVITY or TOPIC	OTHER NOTES
1-3	Introduction <ul style="list-style-type: none"> 1.1 Electrical symbols and schematic diagrams 1.2 Voltage, current, resistance and Ohms Law 1.3 Series resistors, voltage divider rule 1.4 Parallel resistors, current divider rule 1.5 Power and energy, energy conversion 1.6 Maximum power transfer theorem 1.7 Superposition and Thevenin's theorem 1.8 DC Measuring instruments and loading 	8 hours
4-6	Reactive components <ul style="list-style-type: none"> 2.1 DC Capacitors and RC 2.2 AC Capacitors, C reactance and complex numbers 2.3 DC Inductors and RL 2.4 AC Inductors, L reactance and complex RL 2.5 Complex RLC, series resonance 2.6 Complex RLC, parallel resonance 2.7 AC measurements, oscilloscope, phasor diagram 2.8 True, reactive and apparent power 2.9 Power factor and PF correction 	9 hours
8-9	Electromagnetism <ul style="list-style-type: none"> 3.1 Electromagnetism introduction 3.2 Ideal transformer 3.3 Transformer ratios, reflected Z 3.4 Transformer losses, power, selection, rectification 	5 hours
10-11	DC motors and generators <ul style="list-style-type: none"> 4.1 Electromagnetics review 4.2 Electric machine physical construction 4.3 Series, shunt and compound wiring 4.4 DC motor controller 	4 hours
12-14	AC motors and generators <ul style="list-style-type: none"> 5.1 Three-phase sine and graphical representations 5.2 Three-phase induction motors 5.3 Y-delta, primary R and autotransformer starting 5.4 Three-phase synchronous motors 5.5 Brushless DC and stepper motors 5.6 VFD sine signal generation 5.7 VFD specifications, V/Hz and FOC 5.8 Single-phase motors 5.9 Synchronous generators 5.10 Induction generators 5.11 Three-phase power distribution 	11 hours
	Tests and review	7 hours

WEEK or DATE RANGE	ACTIVITY or TOPIC	OTHER NOTES
1-14	<p>Lab Topics (Subject to change)</p> <ol style="list-style-type: none"> 1 Intro to lab and equipment 2 Ohm's Law and Series Resistive Circuits 3 Parallel and Combination Resistors 4 Series & parallel resistors 5 Max power, Thevenin theorem 6 Series/parallel caps, RC 7 RL, stored energy 8 AC RC and RLC filter 9 Transformers 10 Rectifiers 11 DC motors 12 DC & AC Generators 13 AC synchronous motor 14 AC induction motor starting <hr/> <p>Note: Lab attendance is mandatory and all reports must be submitted within one week after scheduled lab time unless special arrangements are made with the instructor.</p> <hr/>	

Students registered with the Centre for Accessible Learning (CAL) who complete quizzes, tests, and exams with academic accommodations have booking procedures and deadlines with CAL where advanced notice is required. Deadlines can be reviewed on the [CAL exams page](http://camosun.ca/services/accessible-learning/exams.html). <http://camosun.ca/services/accessible-learning/exams.html>

EVALUATION OF LEARNING

DESCRIPTION	WEIGHTING
Assignments/Quizzes	20%
Mid-term Test(s)	20%
Labs (all labs/reports must be completed to pass this course)	20%
Final Exam (must pass final exam to pass this course)	30%
Attendance/Participation	10%
TOTAL	100%

If you have a concern about a grade you have received for an evaluation, please come and see me as soon as possible. Refer to the [Grade Review and Appeals](http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.14.pdf) policy for more information. <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.14.pdf>

COURSE GUIDELINES & EXPECTATIONS

SCHOOL OR DEPARTMENTAL INFORMATION

STUDENT RESPONSIBILITY

Enrolment at Camosun assumes that the student will become a responsible member of the College community. As such, each student will display a positive work ethic, assist in the preservation of College property, and assume responsibility for their education by researching academic requirements and policies; demonstrating courtesy and respect toward others; and respecting expectations concerning attendance, assignments, deadlines, and appointments.

SUPPORTS AND SERVICES FOR STUDENTS

Camosun College offers a number of services to help you succeed in and out of the classroom. For a detailed overview of the supports and services visit <http://camosun.ca/students/>.

Support Service	Website
Academic Advising	http://camosun.ca/advising
Accessible Learning	http://camosun.ca/accessible-learning
Counselling	http://camosun.ca/counselling
Career Services	http://camosun.ca/coop
Financial Aid and Awards	http://camosun.ca/financialaid
Help Centres (Math/English/Science)	http://camosun.ca/help-centres
Indigenous Student Support	http://camosun.ca/indigenous
International Student Support	http://camosun.ca/international/
Learning Skills	http://camosun.ca/learningskills
Library	http://camosun.ca/services/library/
Office of Student Support	http://camosun.ca/oss
Ombudsperson	http://camosun.ca/ombuds
Registration	http://camosun.ca/registration
Technology Support	http://camosun.ca/its

Support Service	Website
Writing Centre	http://camosun.ca/writing-centre

If you have a mental health concern, please contact Counselling to arrange an appointment as soon as possible. Counselling sessions are available at both campuses during business hours. If you need urgent support after-hours, please contact the Vancouver Island Crisis Line at 1-888-494-3888 or call 911.

COLLEGE-WIDE POLICIES, PROCEDURES, REQUIREMENTS, AND STANDARDS

Academic Accommodations for Students with Disabilities

The College is committed to providing appropriate and reasonable academic accommodations to students with disabilities (i.e. physical, depression, learning, etc). If you have a disability, the [Centre for Accessible Learning](#) (CAL) can help you document your needs, and where disability-related barriers to access in your courses exist, create an accommodation plan. By making a plan through CAL, you can ensure you have the appropriate academic accommodations you need without disclosing your diagnosis or condition to course instructors. Please visit the CAL website for contacts and to learn how to get started:

<http://camosun.ca/services/accessible-learning/>

Academic Integrity

Please visit <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.13.pdf> for policy regarding academic expectations and details for addressing and resolving matters of academic misconduct.

Academic Progress

Please visit <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.1.pdf> for further details on how Camosun College monitors students' academic progress and what steps can be taken if a student is at risk of not meeting the College's academic progress standards.

Course Withdrawals Policy

Please visit <http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.2.pdf> for further details about course withdrawals. For deadline for fees, course drop dates, and tuition refund, please visit <http://camosun.ca/learn/fees/#deadlines>.

Grading Policy

Please visit <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.5.pdf> for further details about grading.

Grade Review and Appeals

Please visit <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.14.pdf> for policy relating to requests for review and appeal of grades.

Mandatory Attendance for First Class Meeting of Each Course

Camosun College requires mandatory attendance for the first class meeting of each course. If you do not attend, and do not provide your instructor with a reasonable reason in advance, you will be removed from the

course and the space offered to the next waitlisted student. For more information, please see the “Attendance” section under “Registration Policies and Procedures” (<http://camosun.ca/learn/calendar/current/procedures.html>) and the Grading Policy at <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.5.pdf>.

Medical / Compassionate Withdrawals

Students who are incapacitated and unable to complete or succeed in their studies by virtue of serious and demonstrated exceptional circumstances may be eligible for a medical/compassionate withdrawal. Please visit <http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.8.pdf> to learn more about the process involved in a medical/compassionate withdrawal.

Sexual Violence and Misconduct

Camosun is committed to creating a campus culture of safety, respect, and consent. Camosun’s Office of Student Support is responsible for offering support to students impacted by sexual violence. Regardless of when or where the sexual violence or misconduct occurred, students can access support at Camosun. The Office of Student Support will make sure students have a safe and private place to talk and will help them understand what supports are available and their options for next steps. The Office of Student Support respects a student’s right to choose what is right for them. For more information see Camosun’s Sexualized Violence and Misconduct Policy: <http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.9.pdf> and camosun.ca/sexual-violence. To contact the Office of Student Support: oss@camosun.ca or by phone: 250-370-3046 or 250-3703841

Student Misconduct (Non-Academic)

Camosun College is committed to building the academic competency of all students, seeks to empower students to become agents of their own learning, and promotes academic belonging for everyone. Camosun also expects that all students to conduct themselves in a manner that contributes to a positive, supportive, and safe learning environment. Please review Camosun College’s Student Misconduct Policy at <http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.5.pdf> to understand the College’s expectations of academic integrity and student behavioural conduct.

Changes to this Syllabus: Every effort has been made to ensure that information in this syllabus is accurate at the time of publication. The College reserves the right to change courses if it becomes necessary so that course content remains relevant. In such cases, the instructor will give the students clear and timely notice of the changes.