



CAMOSUN COLLEGE
School of Trades & Technology
Electronic & Computer Engineering Technology

ECET 243
Electrical Distribution Systems

COURSE OUTLINE

The calendar description is available @ <http://camosun.ca/learn/calendar/current/web/ecet.html>

Please note: This outline will not be kept indefinitely. Students should keep this outline for their records, primarily to assist in transferring credit to post-secondary institutions.

1. Instructor Information

- (a) **Instructor** Justin Curran
- (b) **Office hours** _____
- (c) **Location** Tech 216A
- (d) **Phone** 250-370-4432 **Alternative:** _____
- (e) **E-mail** jcurran@camosun.bc.ca
- (f) **Website** _____

2. Intended Learning Outcomes

Students will learn how to apply the Canadian Electrical Code for industrial and commercial electrical system design. They will be able to design basic lighting and power distribution systems used in industry, calculate and design feeder circuits for lighting and motor systems, and appropriately size protection circuits for these systems. They will be able to read and draw electrical wiring diagrams for electrical distribution systems and gain experience with the safety procedures surrounding an Arc-flash, and calculations for fault currents. Learning experiences include in class and applied learning opportunities in a lab environment.

3. Required Materials

(a) Texts

N/A

(b) Other

4. Course Content and Schedule

(Can include: Class hours, Lab hours, Out of Class Requirements and/or Dates for quizzes, exams, lecture, labs, seminars, practicums, etc.)

OFFERED:	Semester 3 Fall
CREDIT:	3
IN-CLASS WORKLOAD:	3 Hrs lecture, 2.5 Hrs lab per week
OUT-OF-CLASS WORKLOAD:	6 hours /week
PREREQUISITES:	ECET 141

5. Basis of Student Assessment (Weighting)

(Should be directly linked to learning outcomes.)

a) Labs (14)	20%
b) Assignments and Quizzes	20%
c) Midterm Exam	20%
d) Final Exam	40%

Course Content

1. Review of Electric Power Fundamentals

3 hours

- 1.1. Power & Energy
- 1.2. Alternating Current Relationships
 - 1.2.1. Phasors, RMS vs Peak
 - 1.2.2. Power Factor, Impedance, Capacitance, & Inductance
- 1.3. Single Phase Wiring & Systems
- 1.4. Three Phase Systems & Wiring
 - 1.4.1. Wye – Delta Wiring
 - 1.4.2. Power Relationships
 - 1.4.3. Harmonics

2. Nomenclature and Wiring Diagrams

8 hours

- 2.1. Safety In The Workplace
 - 2.1.1. Training
 - 2.1.2. Arc Flash & Blast
- 2.2. Codes & Organizations
 - 2.2.1. Metric, NEC, CSA, IEEE who do I use?
- 2.3. Terminology and Symbols
- 2.4. Commercial & Residential Building Specifications
- 2.5. Working drawings
 - 2.5.1. Why do I need to read plumbing, HVAC, and carpentry drawings?

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| 3. Electrical Load Calculations | 8 hours |
| 3.1. The Electrical Load | |
| 3.2. Energy Code Consideration | |
| 3.3. Lighting Load Calculations | |
| 3.4. Motor & Appliance Loads | |
| 3.5. Other Loads | |
| 3.6. Voltage-to-frequency (V/F) and frequency-to-voltage (F/V) converters | |
| 4. Branch Circuits & Feeders | 8 hours |
| 4.1. Equipment Terminal Ratings | |
| 4.2. Branch-Circuit Calculations | |
| 4.3. Conductor & Wire Color Coding | |
| 4.4. Considerations for Wire Sizing | |
| 4.5. Circuit Components | |
| 4.6. Derating Factors | |
| 4.7. Defining The Branch Circuits | |
| 4.8. Laying out the Panel Board | |
| 5. Overcurrent Protection | 3 hours |
| 5.1. Fuses and Circuit Breakers | |
| 5.2. Circuit Breakers | |
| 5.3. Short Circuit Calculations | |
| 5.4. Overcurrent Protection Devices | |
| 5.5. Conductor Withstand Ratings | |
| 6. Specialized Circuits | 4 hours |
| 6.1. Loading Schedule | |
| 6.2. Control Circuits | |
| 6.3. Sump Pumps | |
| 6.4. Emergency & Exit Lighting | |
| 6.5. Central Supply | |
| 6.6. Electric Vehicle Charging | |
| 7. Fire Alarms and Safety Systems | 3 hours |
| 7.1. Terminology | |
| 7.2. Stages & Classification of Fire | |
| 7.3. Types of Systems | |
| 7.4. Fire Codes and Standards | |
| 7.5. CEC Requirements | |
| 8. Panel board Selection | 4 hours |
| 8.1. Panel board Sizing | |
| 8.2. The Feeder | |
| 8.3. Neutral Sizing | |
| 8.4. Feeder Loading Schedule | |

9. Reading Electrical Drawings

4 hours

- 9.1. Reading Electrical Drawings
- 9.2. Blueprints
- 9.3. Receptacles
- 9.4. Ground Fault Interrupt Circuits

6. Grading System

(If any changes are made to this part, then the Approved Course description must also be changed and sent through the approval process.)

(Mark with "X" in box below to show appropriate approved grading system – see last page of this template.)

Standard Grading System (GPA)

Competency Based Grading System

7. Recommended Materials to Assist Students to Succeed Throughout the Course

<https://www.csagroup.org/resources-insights/>

<https://www.electricalindustry.ca/latest-news/1589-guide-to-the-canadian-electrical-code-part-i-installment-5>

8. College Supports, Services and Policies



Immediate, Urgent, or Emergency Support

If you or someone you know requires immediate, urgent, or emergency support (e.g. illness, injury, thoughts of suicide, sexual assault, etc.), **SEEK HELP**. Resource contacts @

<http://camosun.ca/about/mental-health/emergency.html> or <http://camosun.ca/services/sexual-violence/get-support.html#urgent>

College Services

Camosun offers a variety of health and academic support services, including counselling, dental, disability resource centre, help centre, learning skills, sexual violence support & education, library, and writing centre. For more information on each of these services, visit the **STUDENT SERVICES** link on the College website at <http://camosun.ca/>

College Policies

Camosun strives to provide clear, transparent, and easily accessible policies that exemplify the college's commitment to life-changing learning. It is the student's responsibility to become familiar with the content of College policies. Policies are available on the College website at <http://camosun.ca/about/policies/>. Education and academic policies include, but are not limited to, Academic Progress, Admission, Course Withdrawals, Standards for Awarding Credentials, Involuntary Health and Safety Leave of Absence, Prior Learning Assessment, Medical/Compassionate Withdrawal, Sexual Violence and Misconduct, Student Ancillary Fees, Student Appeals, Student Conduct, and Student Penalties and Fines.

A. GRADING SYSTEMS <http://www.camosun.bc.ca/policies/policies.php>

The following two grading systems are used at Camosun College:

1. Standard Grading System (GPA)

Percentage	Grade	Description	Grade Point Equivalency
90-100	A+		9
85-89	A		8
80-84	A-		7
77-79	B+		6
73-76	B		5
70-72	B-		4
65-69	C+		3
60-64	C		2
50-59	D		1
0-49	F	Minimum level has not been achieved.	0

2. Competency Based Grading System (Non GPA)

This grading system is based on satisfactory acquisition of defined skills or successful completion of the course learning outcomes

Grade	Description
COM	The student has met the goals, criteria, or competencies established for this course, practicum or field placement.
DST	The student has met and exceeded, above and beyond expectation, the goals, criteria, or competencies established for this course, practicum or field placement.
NC	The student has not met the goals, criteria or competencies established for this course, practicum or field placement.

B. Temporary Grades

Temporary grades are assigned for specific circumstances and will convert to a final grade according to the grading scheme being used in the course. See Grading Policy at <http://www.camosun.bc.ca/policies/E-1.5.pdf> for information on conversion to final grades, and for additional information on student record and transcript notations.

Temporary Grade	Description
I	<i>Incomplete:</i> A temporary grade assigned when the requirements of a course have not yet been completed due to hardship or extenuating circumstances, such as illness or death in the family.
IP	<i>In progress:</i> A temporary grade assigned for courses that are designed to have an anticipated enrollment that extends beyond one term. No more than two IP grades will be assigned for the same course.
CW	<i>Compulsory Withdrawal:</i> A temporary grade assigned by a Dean when an instructor, after documenting the prescriptive strategies applied and consulting with peers, deems that a student is unsafe to self or others and must be removed from the lab, practicum, worksite, or field placement.