COURSE SYLLABUS



COURSE TITLE: Elex 163 Industrial and Home Automation

CLASS SECTION:

TERM: Fall 2022

COURSE CREDITS: 3

DELIVERY METHOD(S): Blended Learning

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

Camosun College campuses are located on the traditional territories of the Ləkwəŋən and WSÁNEĆ peoples. We acknowledge their welcome and graciousness to the students who seek knowledge here. Learn more about Camosun's

Territorial Acknowledgement.

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: lan Cameron

EMAIL: cameron@camosun.bc.ca

OFFICE: TEC211

HOURS:

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

The focus of this course is on both Industrial and Home Automation. The students are introduced to methods for remotely controlling and monitoring mechanical systems in both industrial and home applications. Areas discussed include industrial controls (PLCs), heating and air conditioning (HVAC), lighting, security systems including cameras, motion detection, sensors, and other household elements. An overview of both the hardware and software will be explored as the students get some hands-on practice setting up and configuring various automated systems. An introduction to the concepts surrounding the Internet of Things (IoT) will also be explored.

The student will be responsible for keeping up with the required reading and lab exercises.

Notes and lab activities will be provided through D2L and related web sites.

PREREQUISITE(S): CO-REQUISITE(S): EQUIVALENCIES: Upon successful completion of this course a student will be able to:

- describe the concepts of industrial control systems;
- use interfacing software to configure programmable logic controllers.
- discuss the trends in automation;
- discuss terms and concepts relating to IoT;
- describe the concepts of home automation and control;
- use interfacing software to configure and provision an automated environment;
- discuss security issues with automation systems.

REQUIRED MATERIALS & RECOMMENDED PREPARATION / INFORMATION

- (a) Access to ELEX 163 Camosun D2L online course materials as required
- (b) Access to Cisco Netacad site

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	ACTIVITY or TOPIC		OTHER NOTES
1	Week 1 - Introduction	Reading and Assignment	
	Seminar – Automation Overview.	Assignment 1 – Introduction	
	Lab – Instructor Demo		
2	Week 2 – Introduction to PLCs		
	Seminar – PLC Overview	Assignment 2 - Introduction to PLCs	
	Lab – Introduction to PLCs / Tutorial		
3	Week 3 – PLC Programming I		
	Seminar – PLC Programming Concepts	Assignment 3 - PLC Features	
	Lab – Simple PLC Programming		

ACTIVITY or TOPIC	OTHER NOTES
Week 4 – PLC Programming II	
Seminar – Advanced PLC Programming Concepts Assignment 4 - PLC Programming II	
Lab – Advanced PLC Programming I	
Week 5 – PLC Programming III	
Lab – Advanced PLC Programming II	
Week 6 – Introduction to IoT – Chapter 1	
Seminar – IoT Overview Assignment 6 – IoT Devices	
Lab – 1.2.2.1 Packet Tracer – Adding IoT Devices to a Smart Home	
Lab – 1.2.2.3 Packet Tracer – Connect and Monitor IoT Devices	
Week 7 – IoT Programming and Data – Chapter 2 and 3	
Seminar – Flowcharts / Software Development / Python Assignment 7 – PoE and UPB	
Lab – 2.1.3.6 Cisco Lab – Setting Up a Virtualized Server Environment	
Lab – 2.1.3.7 Cisco Lab – Basic Python Programming	
Week 8 – IoT Automation and Security – Chapter 4 and 5	
Seminar – Automation / Security / Smart Homes Assignment 8 – Micro and Software	
Lab – 2.1.3.8 Cisco Lab – Create a Simple Game with Python IDLE	
Week 9 – IoT Summary – Chapter 6	
Seminar – Continued Learning / Summary Assignment 9 – Sensors	
Lab – 4.1.1.6 Packet Tracer – Explore a Smart Home	
	Week 4 – PLC Programming II Seminar – Advanced PLC Programming Concepts Assignment 4 - PLC Programming II Lab – Advanced PLC Programming III Seminar – Advanced PLC Programming Concepts Assignment 5 - PLC Programming III Lab – Advanced PLC Programming III Week 6 – Introduction to IoT – Chapter 1 Seminar – IoT Overview Assignment 6 – IoT Devices Lab – 1.2.2.1 Packet Tracer – Adding IoT Devices to a Smart Home Lab – 1.2.2.3 Packet Tracer – Connect and Monitor IoT Devices Week 7 – IoT Programming and Data – Chapter 2 and 3 Seminar – Flowcharts / Software Development / Python Assignment 7 – PoE and UPB Lab – 2.1.3.6 Cisco Lab – Setting Up a Virtualized Server Environment Lab – 2.1.3.7 Cisco Lab – Basic Python Programming Week 8 – IoT Automation and Security – Chapter 4 and 5 Seminar – Automation / Security / Smart Homes Assignment 8 – Micro and Software Lab – 2.1.3.8 Cisco Lab – Create a Simple Game with Python IDLE Week 9 – IoT Summary – Chapter 6 Seminar – Continued Learning / Summary Assignment 9 – Sensors

ACTIVITY or TOPIC	OTHER NOTES
Lab – 5.1.2.6 Packet Tracer – Configure Wireless Security	
Week 10 – Home Automation Overview	
Seminar – Home Automation Components – Cabling Assignment 10 – Structured Cabling	
Lab – Tablet / Controller Configuration	
Week 11 – Home Automation Components	
Seminar – Home Automation Components – Lock Systems Assignment 11 – Security Devices	
Lab – Security Devices 5 – Door Locks with Sensor 5 – Security Cameras	
Week 12 – Home Automation Components	
Seminar – Home Automation Components – Cameras Assignment 12 – Security Systems	
Lab – Security Devices 5 – Door Locks with Sensor 5 – Security Cameras	
Week 13 – Home Automation Components	
Seminar – Home Automation Components – Plugs and Bulbs Assignment 13 – Lighting Systems	
Lab – Smart Plug / Smart Bulb Configuration	
8 – Smart Plugs 8 – Smart Bulbs	
Week 14 – Whole Home Automation / Future IoT	
Seminar – Home Automation Whole System Overview Assignment 14 – Home Control Systems	
Lab – Home Automation System Configuration	
	Week 10 - Home Automation Overview

WEEK	ACTIVITY or TOPIC	OTHER NOTES
15	None	

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 noticed is required. Deadlines can be reviewed on the <u>CAL exams page</u>. http://camosun.ca/services/accessible-learning/exams.html

EVALUATION OF LEARNING

DESCRIPTION	WEIGHTING
Quizzes	20%
D2l Assignments	40%
Completion of Lab Activities	40%
If you have a concern about a grade you have received for an evaluation, please come and see	AL 100%

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

COURSE GUIDELINES & EXPECTATIONS

Evaluation for this course will be a combined total of quizzes, course finals, assignments, and lab marks. There is no final exam in this course. Attendance and completion of all material is mandatory to pass the course. Late submissions will be not graded.

Quizzes will be based on current week's material from both seminar and lab content and delivered through D2L.

A Course Final will be completed at the end of each course covering all of the content in each course. There will be no overall final exam covering all of the three courses material.

Completion of Lab Activities will be based on finishing weekly Lab / Packet Tracer exercises and submission of lab reports to the D2L Dropbox by **Sunday 11:59 PM** of the corresponding week – no late labs will be graded.

Please note the following:

- 1. A grade of 50% or better is required in all assessment items above to be able to pass the course.
- 2. No late materials will be accepted past midnight of the last day of the course.
- 3. No opportunity will be available to write missed quizzes.
- 4. Attendance and completion of all lab material is mandatory to pass the course.

SCHOOL OR DEPARTMENTAL INFORMATION

[INSERT TEXT HERE]

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
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 Integrity

Students are expected to comply with all College policy regarding academic integrity; which is about honest and ethical behaviour in your education journey. The following guide is designed to help you understand your responsibilities: https://camosun.libguides.com/academicintegrity/welcome
Please visit http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.13.pdf for Camosun's Academic Integrity policy and details for addressing and resolving matters of academic misconduct.

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 Progress

Please visit https://www.camosun.ca/sites/default/files/2021-05/e-1.1 0.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" (https://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://www.camosun.ca/sites/default/files/2021-05/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 250-370-3841

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.

Looking for other policies?

The full suite of College policies and directives can be found here: https://camosun.ca/about/camosun-college-policies-and-directives

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.