

ORIGINAL COURSE IMPLEMENTATION DATE:SaREVISED COURSE IMPLEMENTATION DATE:SaCOURSE TO BE REVIEWED (six years after UEC approval):Date:Course outline form version: 28/10/2022Date:

OFFICIAL UNDERGRADUATE COURSE OUTLINE FORM

Note: The University reserves the right to amend course outlines as needed without notice.

Course Code and Number: ELTR 211		Number of Credits: 3 Course credit policy (105)				
Course Full Title: Programmable Logic Controllers I						
Course Short Title: PLC I		1				
Faculty: Faculty of Applied and Technical Studies		Department (or program if no department): Electronics				
Calendar Description:						
Learn basics of programmable logic controlle logic, basic instructions. Practice real world a installation, maintenance, and safety.	ers (PLC), mem applications using the second seco	ory organizat ng PLC modu	ion, hardv Ies scalec	vare components, and co I down to lab size. SCAE	ontroller options. PLC wiring, DA, process control and PLC	
Prerequisites (or NONE):	ELTR 190.	ELTR 190.				
Corequisites (if applicable, or NONE):						
Pre/corequisites (if applicable, or NONE):						
Antirequisite Courses (Cannot be taken for additional credit.)		Course	Details			
Former course code/number:			Special Topics course: No			
Cross-listed with:			(If yes, the course will be offered under different letter			
Equivalent course(s):			Directed Otyck severes No.			
(If offered in the previous five years, antirequisite course(s) will be included in the calendar description as a note that students with credit for the antirequisite course(s) cannot take this course for further credit.)			Directed (See	(See policy 207 for more information)		
			Grading System: Letter grades			
			Delivery Mode: Face-to-face only			
Typical Structure of Instructional Hours			Evport	d frequency: Fall only	iiy	
Lecture/seminar 15			Appended inequency. Fail only			
Supervised laboratory hours (science lab)		30	waximu			
			Prior Lo	earning Assessment ar	nd Recognition (PLAR)	
			PLAR is	s available for this course	2.	
	Total hours	45	Transfer Credit (See <u>bctransferguide.ca</u> .)			
Scheduled Laboratory Hours			Transfe	r credit already exists: N	0	
Scheduled Laboratory Hours			Submit	outline for (re)articulatior	n: No	
			(If yes, fill in <u>transfer credit form</u> .)			
Department approval			·	Date of approval:	October 27, 2023	
Faculty Council approval			Date of meeting:	December 2023		
Undergraduate Education Committee (UEC) approval			Date of meeting:	March 1, 2024		

University of the Fraser Valley Official Undergraduate Course Outline

Learning Outcomes (These should contribute to students' ability to meet program outcomes and thus Institutional Learning Outcomes.)

Upon successful completion of this course, students will be able to:

- 1. Install, test and debug PLCs to meet job requirements.
- 2. Design programs to control machines and processes in typical agricultural and industrial applications.
- 3. Interpret electrical control systems symbols commonly used in agricultural and Instrumentation and in the industrial environment.
- 4. Interpret Ladder Logic diagram to troubleshoot PLC systems.
- 5. Apply PLC to relays, sensors measure and control, branch and latching, timers, motor control.
- 6. Implement Distributed Control Systems (DCS) with emphasis on agriculture applications such as environmental control systems and water management systems.

Recommended Evaluation Methods and Weighting (Evaluation should align to learning outcomes.)

Assignments: 10%	Quizzes/tests: 40%	Lab work: 50%
%	%	%

Details:

NOTE: The following sections may vary by instructor. Please see course syllabus available from the instructor.

Typical Instructional Methods (Guest lecturers, presentations, online instruction, field trips, etc.)

Lectures and Lab work with occasional guest lecture

Texts and Resource Materials (Include online resources and Indigenous knowledge sources. <u>Open Educational Resources</u> (OER) should be included whenever possible. If more space is required, use the <u>Supplemental Texts and Resource Materials form</u>.)

Туре	Author or description	Title and publication/access details	Year
1. Textbook	Kamel, K	Programmable Logic Controllers: Industrial Control	2014
2.			
3.			
4.			

5.

Required Additional Supplies and Materials (Software, hardware, tools, specialized clothing, etc.)

Course Content and Topics

Unit 1: Introduction to PLC Control systems and automation

Unit 2: Fundamentals of PLC logic programmers

Unit 3: Timers and counters programming

Unit 4: Math move and comparison instructions

Unit 5: Device configuration and Human Machine Interface (HMI)

Unit 6: Process control design and troubleshooting

Unit 7: Instrumentation and process control

Unit 8: Analog programming and advanced controls

Unit 9: Case studies