



## ELEG 301L Syllabus – Spring 2026

### Basic Course Information:

**Course Prefix/Number:** ELEG 301L

**Course Title:** Programmable Logic Controllers Laboratory

**Core/Elective Course:** Elective

**Class Meeting Times:**

Section 01: Sunday, 8:00 am – 10:45 am

**Class Location:** B109

**Prerequisites:** CPEG 210

**Co-requisites:** None

**Instructional Modality:** On-site

**Instructor:** Fatima Badreddine

**Office Location:** B439

**Office Phone:** 3712

**Email:** fbadreddine@auk.edu.kw

**Office Hours:**

Sunday & Thursday: 10:45 am – 01:45 pm

### AUK Mission Statement:

The American University of Kuwait is a liberal arts institution dedicated to teaching, learning, and scholarship. The University offers programs that provide students with the knowledge and skills necessary for lifelong learning and professional success. AUK enriches society by fostering an environment that encourages critical thinking, effective communication, personal growth, service, and leadership.

### Department/College Mission Statement:

The College of Engineering and Applied Sciences (CEAS) is committed to cultivating an inspiring and innovative learning environment that contributes to a culture of lifelong learning driven by the core values of liberal arts education. In its pursuit of excellence in teaching, research and community engagement, the College offers high quality programs in Engineering and Computing.

### Catalog Course Description:

Configuration of specified PLC Hardware, basics of FB and FC Programming, IEC Timers, and IEC Counters, basic of diagnostics and diagnostics via Web, programming of analog values, Global Data blocks, basics of WinCC and programming of PIC Controller. Prerequisite: CPEG 210.

## Course Learning Outcomes:

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

1. Perform various experiments in PLC laboratory while taking care of electrical safety.
2. Interface and configure specified PLC hardware with digital I/Os.
3. Design and implement basic logic gate operations using PLC software and hardware.
4. Design and implement various processes using ladder logic programming (LAD) for PLCs.
5. Get basic knowledge of PLC math functions and use them in PLC programs.
6. Perform PLC programming using IEC timers and IEC counters.
7. Get basic knowledge of FB and use them in PLC programs.
8. Interface HMI with PLC hardware and use it in various PLC programs.

## Course Delivery/Methodology:

For this course we will be meeting in-person once every week and the material will be presented through brief lectures and lab sheets. All material will be posted on Moodle which can be accessed at <https://lms.auk.edu.kw/>. You will be completing the following evaluations for this course: lab experiments, lab reports, a midterm exam, and a final exam. To successfully complete this course, you must complete the lab experiments during the lab time, write professional technical reports and submit them on Turnitin by the posted due dates and times, and perform well in the exams.

## Required Textbook/Required Readings:

There is no textbook for this course; each week you will be completing lab experiments based on lab sheets which are posted on Moodle and the order in which we will cover the lab experiments are available on the course schedule.

## Evaluations and Grading:

The grading scheme of the lab is distributed according to the table below:

Evaluation Type	Weight
Lab Experiments	25%
Lab Reports	25%
Midterm Exam	25%
Final Exam	25%
<b>Total</b>	<b>100%</b>

Below is a brief description of each evaluation type:

### Lab Experiments:

Lab topics will be covered in the form of simulation tasks and practical tasks. Students must demonstrate their work to the lab instructor before leaving the lab to receive the grade for the lab experiment.

### Lab Reports:

Students are required to submit a technical report documenting the lab experiment. Submissions must be made through Turnitin. Students are required to form teams to work on the lab report. Reports are due on the day of the next lab. A separate file explaining the report guidelines in detail will be available on Moodle. Review the report guidelines before writing and submitting your report.

### Midterm Exam:

The midterm exam will be during lab time. The exam is going to be based on individual work. More details will be announced during the review session.

### Final Exam:

The final exam will be during lab time. The exam is going to be based on individual work. More details will be announced during the review session.

### **AUK Official Grading Scale:**

<b>Letter Grade</b>	<b>Percentage</b>	<b>University Points</b>
A	94-100	4.0
A-	90-93	3.7
B+	87-89	3.3
B	84-86	3.0
B-	80-83	2.7
C+	77-79	2.3
C	74-76	2.0
C-	70-73	1.7
D+	67-69	1.3
D	64-66	1.0
D-	60-63	0.7
F	0-59	0.0

### **AUK Attendance Policy:**

Students are expected to attend all classes, laboratories, and/or required fieldwork. Because excessive absences prevent students from receiving full course benefits and disrupt orderly course progress, AUK has established the following policy:

1. Any student who misses more than 15% of class sessions in a course during a semester should expect to fail, unless the absences are formally excused by the Office of Student Affairs or the Dean of the relevant college.
2. Absences for academic instructional activities must be authorized by the Dean.
3. Absences for medical care (supported by a doctor's note), the death of an immediate family member (documented by a death certificate), or nationally recognized athletic activities require approval from the Vice President for Student Affairs and must be requested by email through the Office of Student Affairs at [studentaffairs@auk.edu.kw](mailto:studentaffairs@auk.edu.kw).
4. Students must inform the Office of Student Affairs of any absence within **five (5) business days** from the date on the supporting document (e.g., doctor's note, official notice) by email. Late submissions will generally not be accepted. If documentation is not immediately available, students must still notify the Office of Student Affairs within the same timeframe and provide the document once it becomes available. Failure to do so may result in the absence being considered unexcused.
5. Once an absence has been approved, students are expected to inform their instructors by forwarding the approval email within **two (2) business days**. Without informing your professors, you may not be able to make up missed exams, assignments, or coursework.
6. If excused, students are required to satisfy all coursework due or assigned during their absence as determined by the course instructor.

7. If a student does not submit documented evidence for absences exceeding the limit, it is the student's responsibility to withdraw from the course by the specified deadline in the academic calendar. Students who withdraw from a course receive a grade of W. Students who do not withdraw from a course nor submit supporting documents for excessive absences will receive a grade of FN (failure for non-attendance).

### **Code of Academic Honesty and Integrity:**

Upon admission to the American University of Kuwait, students agree to act responsibly in all areas of academic, personal, and social conduct and to take full responsibility for their individual and collective action. Such regulations are found in the American University of Kuwait Catalogue, Student Handbook, and the AUK website at [www.auk.edu.kw](http://www.auk.edu.kw). Any question of interpretation regarding the code of academic honesty and integrity shall be reported to the appropriate academic dean. The Code shall be reviewed annually at the discretion of the academic deans. Any student or student organization found to have committed the cited violations or misconduct, either on or off campus, is subject to the disciplinary sanctions outlined in adjudication procedures.

### **Plagiarism:**

The term "plagiarism" includes, but is not limited to, an attempt of an individual to claim the work of another as the product of his or her own thoughts, regardless of whether that work has been published. Plagiarism includes, but is not limited to, improperly quoting or paraphrasing text or other written materials without proper citation on an exam, term paper, homework, or other written material submitted to an instructor as one's own work. Plagiarism also includes handing in a paper to an instructor that was purchased from a term paper service or downloaded from the Internet and presenting another person's academic work as one's own.

### **Cheating:**

The term "cheating" includes but is not limited to, copying homework assignments from another student; working together with another individual on a take-home test or homework when not approved by the instructor, looking at and/or copying text, notes or another person's paper during an examination when not permitted to do so. Cheating also includes the giving of work information to another student to be copied and/or used as his or her own. This includes but is not limited to giving someone answers to exam questions either when the exam is being given or after having taken an exam; informing another student of specific questions that appear or have appeared on an exam in the same academic semester; giving or selling a term paper, report, project, or other restricted written materials to another student.

### **Academic Support:**

The Writing and Tutoring Center (WTC) focuses on empowering students to become independent and successful learners by developing their literacy skills, enhancing their understanding, and helping them improve their academic and study skills. WTC offers tutoring and writing consultations to all AUK students and collaborates with academic departments to continuously develop more effective learning support and classroom workshops. WTC also works with faculty and other support units on campus to recognize and respect the rights and equality of all who seek assistance. Students can schedule appointments through the TutorTrac online appointment system, or they can drop in for assistance. The center also uses various digital platforms to conduct online operations.

### **Disability Accommodations:**

AUK provides an equal and inclusive educational environment in order to enable all students to meet and perform requisite academic standards and to participate in the opportunities and activities of its community. If you believe you can benefit from accommodations for a learning, physical, or mental health disability, [click here to book a session through the Counseling Center/Disability Services Booking Page](#), to ask about disability services at AUK, initiate an accommodation plan, or receive disability services. You can also email [counseling@auk.edu.kw](mailto:counseling@auk.edu.kw) if you need assistance in booking a session.

### **Course Policies/Student Responsibilities:**

1. Students will work in groups and should divide the work uniformly between them.
2. Each group must prepare a collective report. It is your responsibility to ensure that your group's submissions follow the guidelines as each group member will receive the same grade on the lab report. Only one report per group must be submitted through Turnitin before the specified deadline.
3. If you miss a lab session, you will be given no points for that lab.
4. Your reports will be checked for plagiarism using Turnitin. Any report that you claim to be yours and that any content of it belongs to online resources, other groups, or derived from external help (including paraphrasing tools) will result in a zero for that report, and a risk of failing the course.
5. Any attempt to seek external assistance during an exam or to submit an exam solution that is not yours will result in a zero for that exam, and a risk of failing the course.
6. Students are recommended to review their lab grades once posted on Moodle to verify them. Any issue with the grades should be brought to the instructor's attention within one week of the date of post. After one week of posting any assessment grade, grades will not be subject to any further discussion.
7. The last day to withdraw from the lab with a "W" grade is April 9<sup>th</sup>, 2026.
8. Students are expected to follow classroom etiquette and fully respect safety rules.
9. Students are encouraged to use the instructor's office hours as these are opportunities to have in-depth discussions about unclear material and topics.

### **Late and Missing Work Policy:**

1. Students who miss a lab or are unable to complete the tasks due to a valid excuse must complete the work and demonstrate it to the instructor **within one week** of the lab session in order to receive the grade.
2. Deadlines are strict and non-negotiable. Submissions made past the deadline will incur 50 pts deduction.

### **Make-Up Work Policy:**

If you do miss a lab, it is solely your responsibility to catch up on all missed material and ensure that you are prepared to participate in the next lab.

Make-up examinations are permitted only in cases of documented inpatient hospital admission, the death of an immediate family member (supported by a death certificate), or participation in nationally recognized athletic activities. All requests require approval from the Vice President for Student Affairs and must be submitted by email through the Office of Student Affairs at [studentaffairs@auk.edu.kw](mailto:studentaffairs@auk.edu.kw).

### Communication Policy:

Please be sure to use your **official AUK email account, write your full name, and indicate which class and section you are taking (Class #, day/time section)** when you send me an email. If you have a question, please check the syllabus first and if your question is not answered there, then please feel free to send an email and I will be happy to clarify. I will respond to questions via email within 24 hours of receiving them; if I do not respond within 24 hours, please re-send the email.

### Technology Issues:

All submissions must be submitted through Moodle. However, you may experience trouble submitting your work due to technology or internet issues. If such a situation does arise and you are unable to submit your work through Moodle, please send me an email at [fbadreddine@auk.edu.kw](mailto:fbadreddine@auk.edu.kw) and include the completed work. Please make sure that you email me the work before the deadline as this documents that you did finish everything by the due date and time, but that you just had a technology issue. This will ensure that your work will be accepted, and you will not receive a late penalty. Once the technology or internet issue is resolved, please upload the report to Moodle. In general, always be sure to frequently save your files and keep backups of your work.

### Course Schedule:

Week	Date	Topic
1	1 Feb	No Lab – Add/Drop Week
2	8 Feb	Electrical Lab Safety Orientation + Introduction to PLC – Part 1
3	15 Feb	Introduction to PLC – Part 2
4	22 Feb	Lab 1: Introduction to TIA Portal
5	1 March	Lab 2: Implementing Logic Gates
6	8 March	Lab 3: Implementing Burglar Alarm System
7	15 March	Lab 4: Introduction to Math Functions
8	22 March	No Lab – Eid El Fitr
9	29 March	Review
10	5 April	Midterm Exam
11	12 April	Lab 5: Introduction to PLC Timers
12	19 April	Lab 6: Automatic Car Washing System
13	26 April	Lab 7: Introduction to PLC Counters
14	3 May	Lab 8: Introduction to HMI
15	10 May	Review
16	17 May	Final Exam
17	24 May	No Lab – Waqfat Arafat & Eid Al Adha
18	31 May	No Lab – University’s Final Exam Week

### Syllabus Changes:

There may be changes to the schedule and syllabus during the semester. When this happens, I will inform you in class and over email.

**Mapping to ABET Student Outcomes:**

	SO-1	SO-2	SO-3	SO-4	SO-5	SO-6	SO-7
1	X	X		X	X	X	X
2	X	X		X	X	X	X
3	X	X		X	X	X	X
4	X	X		X	X	X	X
5	X	X		X	X	X	X
6	X	X		X	X	X	X
7	X	X		X	X	X	X
8	X	X		X	X	X	X

- SO-1. an ability to apply identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
- SO-2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
- SO-3. an ability to communicate effectively with a range of audience.
- SO-4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
- SO-5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
- SO-6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions.
- SO-7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.