



## ELEG 320L (Spring 2023) Syllabus

### Basic Course Information:

**Course Prefix/Number:** ELEG 320L  
**Course Title:** Signals & Systems Laboratory  
**Co-requisite:** ELEG 320  
**Credit:** 1  
**Core/Elective Course:** Core  
**Class Meeting Times:**  
Section 01: Wednesday, 8:00 am-10:45 am  
Section 02: Sunday, 8:00 am-10:45 am  
**Instructional Modality:** Onsite  
**Class Location:** B105

**Instructor:** Amal Alateyah  
**Office Location:** B440  
**Office Phone:** 3738  
**Email:** aalateyah@auk.edu.kw  
**Office Hours:**  
Sunday: 11:00 am-1:00 pm  
Monday: 11:00 am-12:00 pm  
Tuesday: 11:00 am-12:30 pm  
Wednesday: 11:00 am-12:30 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:

A laboratory component for the course ELEG 320 Signals & Systems. The lab syllabus is aligned with the course topics. Implementations are done using hardware circuits and software tools.

### Course Learning Outcomes:

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

Course Learning Outcomes (CLOs)
CLO1: Analyze time-domain signals and linear time-invariant (LTI) system models in MATLAB.
CLO2: Analyze frequency-domain signals and linear time-invariant (LTI) system models in MATLAB using transformation techniques such as Laplace, Fourier, Z, etc.
CLO3: Implement filters in MATLAB.
CLO4: Implement solutions to practical problems related to digital music synthesis, image processing and enhancements, and digital communication.

### Course Delivery/Methodology:

For this course, we will be meeting in person once every week. Materials will be presented through lectures and lab exercises. All lab materials will be posted on Moodle, which can be accessed at <https://lms.auk.edu.kw/>. All required assignment submissions must be made through Moodle. You will be completing the following evaluations for this course: lab exercises, a project, a midterm exam, and a final exam. To successfully complete this course, you must complete the lab exercises correctly and demonstrate them to the instructor before the deadline, complete the project tasks by the posted due dates and times, and perform well in the exams.

### Required Textbook/Required Readings:

There is no textbook for this course; all lab materials including the lab sheets will be provided on Moodle, via the instructor.

### Evaluations and Grading:

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

Evaluation Type	Weight
Lab Exercises	30%
Project	20%
Midterm Exam	20%
Final Exam	30%
<b>Total</b>	<b>100%</b>

Below is a brief description of each evaluation type:

#### Lab Exercises:

The lab exercises consist of signals-related exercises that must be solved in MATLAB code. Students will work in groups of two members to attempt the lab exercises during the lab session.

Students will be required to demonstrate their complete work to the instructor by the beginning of the next lab session.

Project

This is mainly a group assignment where students will be tasked to solve problems related to signals using MATLAB. The project grade will be split between the project report, submitted code, and the demonstration of the project understanding through a quiz. Although the project completion and the report are teamwork, the project quiz will be individual work. More details regarding the project will be shared later in the semester.

Midterm Exam:

The midterm exam will be held in the lab. It will mainly require you to solve problems using MATLAB code. The midterm exam will cover the materials of labs 1-5.

Final Exam:

The final exam will be held in the lab. It will mainly require you to solve problems using MATLAB code. More details will be announced towards the end of the semester.

**AUK Official Grading Scale:**

Letter Grade	Percentage	University Points
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:**

The American University of Kuwait recognizes that class attendance is an important element of students' classroom success. 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 on class attendance. Any student who misses more than 15% of class sessions of any course during a semester should expect to fail, unless s/he submits documented evidence to the course instructor of inpatient medical care, death of an immediate family member, academic instructional activities, or national athletic activities. If excused, students are required to satisfy all coursework due or assigned during their absence as determined by the course instructor. If a student does not submit documented evidence for her/his absence exceeding the limit, it is the student's responsibility to withdraw from the course by the specified deadline, as indicated on 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 is not tolerated under all circumstances. A student shall not engage in plagiarism nor employ nor seek to employ any other unfair means for an examination or in other form of work submitted for assessment. Any person accused of plagiarism shall receive no points and subject to receive a grade of F in the course.

Exams are performed individually and any attempts at cheating or submitting work that is not yours or seeking external assistance will result in a zero in the exam, and a risk of failing the course.

### **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, quoting improperly 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 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. Attending the labs on time is key to being successful in this course. There will be no make-up for labs or exams that you miss. If you do miss a lab, it is solely your responsibility to make sure that you are up to date with all the materials and content that you missed and are ready to participate in the next lab.
2. Students will work in a team of two during the lab session. Each student must demonstrate and explain their work during the lab session by the set due date to receive credit for the lab exercises grade.
3. Students' MATLAB script files are expected to be neatly organized and well commented. They also should start with a comment mentioning the student(s) name(s) and ID#(s).
4. Plagiarism will not be tolerated. Kindly adhere to AUK's code of academic integrity and honesty as detailed in the university's academic catalog.
5. If you fail to demonstrate your work, you will be given no points for the lab exercises.
6. The deadlines to complete and demonstrate the solution to the lab exercises are firm; no extension will be granted.
7. The deadline to complete and submit the project tasks is firm. No extension will be granted.
8. Students are encouraged to use the instructor's office hours as these are opportunities to have in-depth discussions about unclear material and topics.
9. All required special arrangements due to a documented disability must be communicated to the instructor during the first week of the course.
10. Students are expected to follow classrooms etiquette.
11. The use of mobile phones is not allowed for taking notes during the lab time or for recording the lecture.
12. The last day to withdraw from the lab with a "W" grade is Thursday, April 6<sup>th</sup>, 2023.

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

Deadlines are strict and firm, no extension will be granted. Late work will not be accepted.

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

There will be no make-up for labs or exams that you miss.

### **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 (ELEG 320L, 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 respond to questions via email or posted on the discussion forum within 24 hours of receiving them; if I do not respond within 24 hours, please resend the email. Please note I normally respond during weekdays, especially during office hours. Emails sent on holidays or weekends will be responded to on the next working day.

### Technology Issues:

Any required assignment submission must be made through Moodle. This includes lab exercises files (when required) and the project submission. However, if you experience trouble submitting an assignment due to technology or internet issues and you are unable to submit your assignment through Moodle, please send me an email at [aalateyah@auk.edu.kw](mailto:aalateyah@auk.edu.kw) and include the **completed** assignment. Please make sure that you email me the assignment **before** the deadline as this documents that you did finish everything by the due date and time, but you had a technology issue. This will ensure that your assignment will be accepted, and you will not miss the submission deadline. Once the technology or internet issue is resolved, please upload the assignment to Moodle. In general, always be sure to frequently save your files and keep backups of your assignments.

For work submission, it is the student's responsibility to ensure submitting the correct file. It is good practice to check/ download the file you intend to submit to make sure it is the correct file, and that the submission is successful.

### Course Schedule:

Section 1 (Wednesday):

Date	Week	Lab#	Scope
2/8	1	-	No lab
2/15	2	<b>1 &amp; 2</b>	Introduction to MATLAB
2/22	3	<b>1 &amp; 2</b>	Introduction to MATLAB (cont.)
3/1	4	-	No lab (National & Liberation Days/ Spring Break)
3/8	5		Review
3/15	6	<b>3</b>	Basic Signals and Signals Classification
3/22	7	<b>4</b>	Convolution, Deconvolution, Cross-Correlation, and Autocorrelation, and LTI Systems & their Interconnections
3/29	8	<b>5</b>	Basic Applications in Image Processing
4/5	<b>9</b>		Review
4/12	10		<b>Midterm Exam</b>
4/19	11	<b>6</b>	Digital Music Synthesis, ADSR Envelope
4/26	12	<b>7</b>	Fourier Transform and Inverse Fourier Transform, Filter Design
5/3	13	-	No lab (Eid El-Fitr)
5/10	14	<b>8</b>	Laplace Transform, Inverse Laplace Transform, Obtaining the Zero-Pole Diagrams, Residues, Bode Plots, Step, Frequency, and Impulse Response
5/17	15	<b>9</b>	Z-Transform, Inverse Z-Transform
5/24	16		<b>Project Quiz &amp; Demonstration + Review</b>
5/31	17		<b>Final Exam, Project Report &amp; Files Submission is Due</b>
6/7	18	-	No lab (University Final Exams Week)

Section 2 (Sunday):

Date	Week	Lab#	Scope
2/5	1	-	No lab
2/12	2	<b>1 &amp; 2</b>	Introduction to MATLAB
2/19	3	-	No lab on Sunday (Prophet's Ascension) → Make up on March 18 <sup>th</sup>
2/26	4	-	No lab (National & Liberation Days/ Spring Break)
3/5	5	<b>1 &amp; 2</b>	Introduction to MATLAB (cont.)
3/12	6	<b>3</b>	Basic Signals and Signals Classification
<b>3/18</b>			Review
3/19	7	<b>4</b>	Convolution, Deconvolution, Cross-Correlation, and Autocorrelation, and LTI Systems & their Interconnections
3/26*	8	<b>5</b>	Basic Applications in Image Processing
4/2	<b>9</b>		Review
4/9	10		<b>Midterm Exam</b>
4/16	11	<b>6</b>	Digital Music Synthesis, ADSR Envelope
4/23	12	<b>7</b>	Fourier Transform and Inverse Fourier Transform, Filter Design
4/30	13	-	No lab (Eid El-Fitr)
5/7	14	<b>8</b>	Laplace Transform, Inverse Laplace Transform, Obtaining the Zero-Pole Diagrams, Residues, Bode Plots, Step, Frequency, and Impulse Response
5/14	15	<b>9</b>	Z-Transform, Inverse Z-Transform
5/21	16		<b>Project Quiz &amp; Demonstration + Review</b>
5/28	17		<b>Final Exam, Project Report &amp; Files Submission is Due</b>
6/4	18	-	No lab (University Final Exams Week)

\*Ramadan begins. Schedule might be adjusted.

**Syllabus Changes:**

There may be changes to the course schedule or course policies during the semester. Any changes will be announced 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
2	X	X			X	X	X
3	X	X			X	X	X
4	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.