COLLEGE OF ENGINEERING
DEPARTMENT OF ELECTRICAL ENGINEERING
ELEC 351 / Signals and Systems
Fall 20xx

Instructor Information

Name:
Academic title:
Office:
Phone:
E-mail:
Office Hours:
If you need to see me outside of the posted office hours, please set up an appointment with me, either by speaking to me before or after class, or by sending me an e-mail message.

TA Information

Name:
Office:
Phone:
E-mail:

Class/Laboratory Schedule

Lectures:
Laboratory:

Coordinator Information

Course Information

Catalog Description:
Continuous time representation of signals and systems: Signal and system properties; Convolution and time domain response of systems; Fourier series, Fourier transform, and signal spectrum; Laplace transform: Transfer functions; Analog filters; Nyquist Shannon sampling theorem and discrete time signals. Several laboratory experiments to reinforce material from the lectures will be conducted.

Credits:
3

Contact Hours:
Lecture hours: 3 – Lab hours: 1

Prerequisites:
ELEC201 OR (ELEC 210 and ELEC 211)

Textbook(s):
- B. P. Lathi, "Signal Processing and Linear Systems," Oxford University Press, 2nd Edition, 2009, ISBN 978-0195392579.

References:
- Alan V. Oppenheim, Alan S. Willsky, and S. Hamid, "Signals & Systems," Prentice-Hall, 2nd Edition, 1997.

Course Objectives:
To introduce students to the concepts of signal and system classification and analysis both in time domain and frequency domain, to familiarize students with the properties and importance of linear time invariant (LTI) systems, and to expose students to the basics of sampling theorem.

Course Learning Outcomes (CLO):
1. Characterize signals and systems in the time domain.
2. Find the frequency domain representation of a signal or system given its time domain representation and vice versa.
3. Calculate the output from a LTI system given its input and impulse response using time-domain convolution and/or frequency domain transfer function multiplication.
4. Convert a continuous-time signal to a discrete-time signal and vice-versa using the sampling theorem concepts.
5. Use MATLAB to analyze and simulate linear time invariant systems.
6. Understand and use the basic principles of signal acquisition and filtering.

Relationship of Course Learning Outcomes (CLOs) to Student Outcomes (SOs):

Course Learning Outcomes (CLOs)	Related Student Outcomes (SOs)						
	1	**2**	**3**	**4**	**5**	**6**	**7**
1	X		x				
2	X	x					
3	X						
4	X						x
5		x				x	
6		x	x		x		x

Student Outcomes (SOs)

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
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.
3. An ability to communicate effectively with a range of audiences
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
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.
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Topics Covered:

Topics	Chapter	Sections	Weeks
Introduction to signals and systems			1/2
Properties and operations on signals and systems			1 1/2
System representations			1/2
LTI system analysis in the time domain			2
Spectral representation of signals: Fourier series analysis			2
Midterm Exam			
Continuous time Fourier transform			2
System analysis in the frequency domain			1
The Laplace transform and transfer functions			1 1/2
Sampling, aliasing, reconstruction			2
Filters			1
Total			**14**

*Optional

List of Laboratory Experiments Performed:

S. No.	List of Matlab experiments
1.	Matlab fundamentals
2.	Signal generation, properties, and manipulation
3.	Convolution and its applications
4.	Fourier series, Gibbs phenomenon and applications.
5.	Fourier transform, signal amplitude and phase spectrum
6.	Signal sampling, aliasing, and reconstruction
7.	Introduction to Simulink: • Transfer function • Filters

Method of Instruction

2/3 Class lectures every week
1 Lab every week
1 Midterm exam
1 Final exam
Class discussions

Assessment Methods and Grading Policy

The following grading policy cannot be altered without the approval of the department board and head of department authorization.

Homework: 5%
Quizzes: 10%
Lab Assignments **and/or** Project: 10%
Lab Tests: 5%
Midterm Exam(**s**): 30%
Final Exam: 40%

ABET Contribution of Course to Professional Component

Math & Basic Science : 40%
Engineering : 30%
Engineering Design : 20%
General Education : 10%

Computer/Software Usage

Matlab

Laboratory Projects

Same as course project

Course Ground Rules

A reiteration and emphasis of certain rules and course expectations:
- zero tolerance for Cheating & Plagiarism (Refer to University Rules)
- missed exams without prior proper excuse will get ZERO (Refer to University Rules)
- shouldn't be late more than 5 minutes to lectures
- switch off mobiles during the lecture time and remove from your desk
- effective participation required in the class
- collaboration but NOT copying of homework, lab reports and projects is encouraged
- keep abreast of course announcements
- students must use the assigned university e-mail address rather than a personal e-mail address
- use the course discussions groups and email communications with each other and with instructor all through blackboard.
- answer to your emails/course web questions will be within 24 hours on working days (delayed answer on weekends/holidays)
- Students should address technical problems immediately.

Use of AI Tools including ChatGPT

"In accordance with Article 6 of the Student Code of Conduct at Qatar University, academic violations include a range of actions, one of which pertains to submitting work that is not the individual's own production. This includes using creative artificial intelligence tools such as ChatGPT to produce content, images, videos, or programming code and presenting it as original work. Therefore, students are cautioned that using artificial intelligence tools such as ChatGPT or any similar tools to produce academic content and present it as their own work is considered plagiarism, exposing the student to disciplinary penalties as stipulated in Qatar University's Student Code of Conduct. In light of this, we urge all students to adhere to ethical standards in all assignments and academic work, and to seek guidance from the course instructor when unsure about the proper and ethical use of artificial intelligence sources in completing assignments, duties, and academic tasks."

University Code of Conduct

QU expects its students to adopt and abide by the highest standards of conduct in their interaction with professors, peers, staff members and the wider university community. Moreover, QU expects its students to act maturely and responsibly in their relationships with others. Every student is expected to assume the obligations and responsibilities required from them for being members of the QU community.

As such, a student is expected not to engage in behaviors that compromise their integrity, as well as the integrity of QU. Further information regarding the University Code of Conduct may be found on the web at http://www.qu.edu.qa/students/code-of-conduct

Support for Students with Special Needs

It is Qatar University policy to provide educational opportunities that ensure fair, appropriate and reasonable accommodation to students who have disabilities that may affect their ability to participate in course activities or meet course requirements. Students with disabilities are encouraged to contact their Instructor to ensure that their individual needs are met. The University through its Inclusion and Special Needs Support Center will exert all efforts to accommodate for individuals' needs.

Contact Information for Inclusion and Special Needs Support Center:
Tel-Female: (00974) 4403 7972
Tel-Male: (00974) 4403 7946
Location: Student Activities Building
Email: specialneeds@qu.edu.qa

Academic Support and Learning Resources

The University Student Learning Support Center (SLSC) provides academic support services to male and female students at QU. The SLSC is a supportive environment where students can seek assistance with academic coursework, writing assignments, transitioning to college academic life, and other academic issues. SLSC programs include: Peer Tutoring, the Writing Lab, Writing Workshops, and Academic Success Workshops. Students may also seek confidential academic counseling from the professional staff at the Center.

Contact Information for Students Support and Learning Resources:
Tel: (00974) 4403 3870
Fax: (00974) 4403 3871
Location: Female Student Activities Building
E-mail: learningcenter@qu.edu.qa

College of Engineering Learning Support

The Engineering Success Oasis (ESO) provides academic support services to all students registered in Engineering courses at QU. We provide academic assistance through group and one-on-one tutoring, tailored major programs, and various workshops. Support schedules are announced at the beginning of semesters.

Contact Information for College of Engineering Learning Support:
Females
Tel: (00974) 4403 6380
Email: CENG.SuccessOasis.F@qu.edu.qa

Males
Tel: (00974) 4403 6380
Email: CENG.SuccessOasis.M@qu.edu.qa

Sessions' Booking
Females
1- One-to-one sessions' registration via Simplybook:
https://crulearningfemales.simplybook.me
2- Weekly sessions via email invitation from Engineering Success Oasis (ESO)

Males
1- One-to-one sessions' registration via Simplybook:
https://crulearningmales.simplybook.me
2- Weekly sessions via email invitation from Engineering Success Oasis (ESO)

Student Complaints Policy

Students at Qatar University have the right to pursue complaints related to faculty, staff, and other students. The nature of the complaints may be either academic or non-academic. For more information about the policy and processes related to this policy, you may refer to the student handbook.

Declaration

This syllabus and contents are subject to changes in the event of extenuating circumstances. The instructor (with approval of the Head of Department) reserves the right to make changes as necessary. If changes are necessitated during the term of the course, the students will be notified by email communication and posting the notification on the online teaching tool Blackboard. It is the student's responsibility to check on announcements made while they were absent.

Faculty Name:
Last Modified:
Date: