EEL 3135

Signals And Systems

Section: U01

In Person

Spring Term 2026

Course Meeting Information

Examples:

Classes are scheduled from 3:30 PM to 4:45 PM at EC 2832

Professor Information

Jean Andrian

Roles: Primary Instructor

Email: andrianj@fiu.edu

Phone: 305 348 2115 or 786 523 8976

Office Hours: Mondays and Wednesdays 2:00 PM to 3:00 PM

Office Location: EC 3915

Department or Academic Unit: Electrical and Computer Engineering

Course Prerequisites

Course prerequisites, if any, are listed below.

Prerequisite: EEL 3120 or MAS 3105 or BME 2740 for BME students Corequisite: MAP2302

Course Description

Use of Fourier analysis in electrical and electronic systems. Introduction to probability theory, linear algebra and complex variables. (3 credits)

Textbook and Course Materials

no book required

Required/Recommended: N/A

Authors: N/A

Publisher: N/A

Publication Date: N/A

Copyright Date: N/A

ISBN 10: N/A

ISBN 13: N/A

Chapters/Pages: N/A

Panther Book Pack

Get all required course materials for $20.50 per undergrad credit hour through Panther Book Pack. You'll be charged automatically unless you opt out within 3 days after the add/drop deadline.

For more details, to compare costs, and to learn how to access your course materials, visit the Panther Book Pack information page on FIU OneStop.

Student Learning Outcomes/Objectives

- **To give students the necessary mathematical tools for upper-level courses in communication systems, control systems, and digital signal processing**

Expectations of the Course

Please visit the following websites:

http://academic.fiu.edu

http://drc.fiu.edu

Academic Misconduct : For work submitted, it is expected that each student will submit their own original work. Any evidence of duplication, cheating or plagiarism will result at least a failing grade for the course.

Deadlines: Assignments are due at the beginning of the class period on the date specified. Assignments submitted late (within one week) will receive half credit.

To get assistance try to see the instructor by appointment.

Students are encouraged to ask questions and to discuss the course topics with the instructor and with each other.

Cell phones are not allowed to be used in class.

Instructor reserves the right to change course materials or dates as necessary.

Exam policy

1. **Make sure to complete the assigned homework in order to do well in the exam.**
2. **All exams are closed notes.**
3. **Use of any electronic device with keyboard is prohibited. This also applies to cell phones with messaging systems.**
4. **No discussion is permitted during the exams.**
5. **Instructor is not compelled to give credit for something he cannot read or follow logically.**
6. **Cheating is considered a serious offense. Students who are caught will receive the appropriate consequences.**

Assignments & Assessments

Discussion Forums

Keep in mind that your discussion forum postings will likely be seen by other

members of the course. Care should be taken when determining what to post.

Discussion Forum Expectations:

- **Provide clear guidance on the expectations and requirements**
- **Available dates (unlimited or for a specific time)**
- **Criteria for evaluating the originality and quality of students' comments and grade credit expected**
  (Rubric is highly encouraged)
- **The expected turn-around time for feedback or grades.**

Assignments

- **Provide clear guidance on the expectations and requirements**
- **Provide due dates and late assignment policies**
- **Define if it is an individual or group assignment (groups: Let the students know how the groups will be formed)**
- **Specify and describe how to submit assignments**
- **State the criteria for evaluation (Rubric or list of criteria)**
- **The expected turn-around time for feedback or grades**

Quizzes

In order to mitigate any issues with your computer and online assessments, it is very important that you take the Practice Quiz from each computer you will be using to take your graded quizzes and exams. Assessments in this course are not compatible with mobile devices and should not be taken through a mobile phone or a tablet.

- **List all assessments (i.e. graded or practice)**
- **Provide the dates and times when assessments will become available (i.e. From Monday 10:00 am – Tuesday 11:59 pm)**
- **Provide assessment duration (i.e. 30 minutes, 1 hour)**
- **Provide details for results**
- **When will students be able to see the results (i.e. Immediately after the exam, after the availability period has ended, or not at all)**
- **What will they be able to see the results (i.e. Total score only, all of the questions and answers, etc.)**
- **The expected turn-around time for feedback or grades**

Grading

Grading Scheme:

Homework	10%
Midterm and final	70% (35% each)
Project	20%
Total	**100%**

Grading Scale:

Letter	Range (%)	Letter	Range (%)	Letter	Range (%)	Letter	Range (%)	Lette
A	95-100	**A-**	90-94	**B+**	86-89	**B**	83-85	**B-**
Letter	Range(%)	Letter	Range(%)	Letter	Range(%)	Letter	Range(%)	Lette
C+	76-79	**C**	73-75	**C-**	70-72	**D**	60-69	**F**

Canvas Schedule

Due Date	Assignment Name	Assignment Type	Points
	Midterm	Assignment	100
1/19/26	Homework 1	Assignment	100
2/12/26	Homework 2	Assignment	100
3/1/26	Homework 3	Assignment	100
4/13/26	Homework 5	Assignment	100
4/17/26	Project	Assignment	100

Schedule of Topics

Week-1 : Review of complex numbers: rectangular and polar forms.

Week-2: Complex numbers: nth roots, quadratic equation.

Week-3 : Introduction to signals and systems. Signals: classification. Signal transformations.

Week-4 : Elementary signals: impulse, step, and ramp functions, real and complex exponential functions.

Week-5 : Properties of the impulse (delta) function, energy and power signals.

Week-6 : General definition and description of a system. Linear systems, Time-invariant systems, and Linear and Time-Invariant (LTI) systems. Project will be available.

Week-7 : Impulse response and step response of an LTI system. Convolution

integral. Graphical convolution method.

Week-8 : Causal, BIBO stable LTI systems. LTI response to a sinusoidal input. LTI systems summary.

Week-9 : Midterm exam. Introduction to Fourier analysis. Three Fourier series representations of periodic signals. Calculations of complex exponential Fourier series coefficients.

Week-10 : Calculation of Trigonometric Fourier Series coefficients. Trigonometric Fourier Series of odd and even signals. Compact Trigonometric Fourier Series.

Week-11 : Magnitude, Amplitude, and Phase plots of Fourier coefficients. Fourier Series an LTI systems. The average power of a periodic signal in terms of Fourier series coefficients. Summary of the Fourier representation of periodic signals. Sufficient conditions for the existence of Fourier Series (Dirichlet conditions for Fourier Series).

Week-12 : Introduction and derivation of the Fourier Transform and its inverse. Conditions for the existence of Fourier transform (Dirichlet conditions for Fourier transform). Fourier transforms of common signals.. Properties of Fourier transform.

Week-13 : Introduction to Laplace Transform. Laplace Transform representation of signals. Convergence of the Laplace Transform. The s-plane, poles and zeros.

Week-14 : Thanksgiving. Properties of the Laplace Transform. Initial an Final value theorems. Inversion of the unilateral Laplace Transform.

Week-15 : Solving differential equations using Laplace Transform. Stability and transfer function.

Week-16 : Final exam, project due on exam day.

This is a tentative outline of the course. It is subject to change with written notice.

Nondiscrimination Statement

The **Office of Civil Rights Compliance and Accessibility** (CRCA) is responsible for ensuring that FIU maintains a workplace and learning environment free from discrimination, where current and prospective faculty, staff, and students are treated equitably. If any student, employee, or applicant has a sincere and reasonable belief that they have been discriminated against or harassed based on age, color, disability, marital status, ethnic or national origin, race, religion, retaliation, sex, or any other protected category, they can report their concerns to the CRCA team through report.fiu.edu.