Learning objectives

This course introduces signal processing and systems analysis. Students will learn the fundamental mathematics needed to formulate and solve problems in these areas. The coverage includes: fundamental discrete- and continuous-time signals, definition and properties of systems, linearity and time invariance, convolution, impulse response, differential and difference equations, Fourier analysis, sampling and aliasing, applications in communications. The prerequisites are ECE212 (Circuit Analysis), MAT188 (Linear Algebra), and MAT290 (Advanced Engineering Mathematics).

Instructors

Professor Josh Taylor (course coordinator)
Email: josh.taylor@utoronto.ca
Office: SF1021C
Office hours: TBA

Professor Ali Hooshyar
Email: hooshyar@ece.utoronto.ca
Office: SF1021E
Office hours: TBA

Email policy: The instructors may not always respond to personal emails due to the large size of the class. If you would like to discuss some aspect of the course, please email the Head Administrative TA, the Head Lab TA, or attend one of the instructors’ office hours.

Head Administrative TA

The Head Administrative TA is Majid Raeis. Please contact the Head Administrative TA for all administrative issues (e.g., change of tutorial or lab section, exam re-grades). Only contact the Head Administrative TA by email and from your University of Toronto account. If you know you will miss some parts of the course for personal reasons, inform the Head Administrative TA at least two weeks in advance.

Email: m.raeis@mail.utoronto.ca
Office: BA4177
Office hours: TBA
Head Lab TA

The Head Lab TA is TBA. If you have questions about any aspect of a lab, you should ask the Head Laboratory TA.

Email: TBA
Office: TBA

Course texts and references

There is no required textbook. The course notes are available on the course website under Course Materials. You may find the following supplementary references helpful.

- *Signals and Systems* by Oppenheim, Willsky, and Nawab. Comprehensive and mathematical.
- *Signal Processing First* by McClellan, Schafer, and Yoder. Introductory, less mathematical.

Problem sets

Problem sets will be assigned most weeks. They will not be collected or graded. The purpose of the problem sets is to assist your learning. The quizzes and exams will assume that you have completed and understood all assigned problems.

Lectures

Section LEC0101
- Tuesday 1-2 in MC252
- Wednesday 1-2 in MC252
- Friday 1-2 in MC252

Section LEC0102
- Monday 3-4 in MC254
- Wednesday 3-4 in MC254
- Friday 3-4 in MC254

Section LEC0103
- Tuesday 1-2 in BA1170
- Wednesday 1-2 in BA1170
- Friday 1-2 in BA1170

Tutorials

Tutorials are held every week starting the week of January 14. The tutorial sections are:
- TUT0101: Thursday 3-5 in GB244
- TUT0102: Thursday 3-5 in BA1200
- TUT0103: Thursday 2-4 in MY330
- TUT0104: Tuesday 3-5 in SF2202
• TUT0105: Wednesday 3-5 in LM162
• TUT0106: Thursday 3-5 in BA1210

Labs

• All labs are in SF1013. The lab sections meet as indicated below.
  – PRA0101: Monday 10-12, February 24 & March 9
  – PRA0102: Monday 10-12, February 10 & March 16
  – PRA0103: Wednesday 1-3, February 26 & March 11
  – PRA0104: Wednesday 1-3, February 12 & March 18
  – PRA0105: Tuesday 9-11, February 25 & March 10
  – PRA0106: Tuesday 9-11, February 11 & March 17
• You will work in groups of two. You may choose a partner or ask the lab TAs to help you find one.
• You must turn in your lab report to the TAs by the end of the lab period. Late reports will not be accepted and will receive a grade of zero.
• All labs are based on Matlab. Most students will gain concurrent exposure to Matlab through ECE221.
• If you believe an error has been made in entering one of your lab grades, you should notify the head lab TA within two weeks of when the lab grades were posted. We will not consider requests made after this time period.

Exams

There will be two midterm exams and a final exam. The midterms will be in the evening on Wednesday, February 5 and Thursday, March 5. The location, coverage, and format of each exam will be announced on the course website.

Regrade policy

Grading issues are handled by the Head Administrative TA. Regrade requests will only be accepted within a finite window following an exam or quiz, and will not be accepted during lecture or tutorial. Regrades will only be considered for exams written in pen. We reserve the right to fully regrade any submitted quiz or exam. Therefore, regrading may result in a lower overall grade.

If you believe an error has been made in grading your exam, you should attach a clear, neat, and concise note to your test indicating (i) which questions were graded incorrectly and (ii) why you deserve more points.

Grading

The breakdown of the final grade is:
• 10%: Labs
• 40%: Midterm exams
• 50%: Final exam
Planned coverage

- Fundamentals of continuous time signals
- Fourier series of continuous time periodic signals: the CTFS
- Fundamentals of discrete time signals
- Fourier series of discrete time periodic signals: the DTFS
- Geometric perspectives
- Discrete time systems
- Fourier transform of discrete time aperiodic signals: the DTFT
- Continuous time systems
- Fourier transform of continuous time aperiodic signals: the CTFT
- Sampling of CT signals

Calendar description

Fundamental discrete- and continuous-time signals, definition and properties of systems, linearity and time invariance, convolution, impulse response, differential and difference equations, Fourier analysis, sampling and aliasing, applications in communications.