

## Syllabus

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### 1. Course Staff and Office Hours

Instructor:	Peter Milder peter.milder@stonybrook.edu Light Eng. 231
Office Hours:	Monday and Wednesday, 10:00am–12:00pm
Graduate TA:	TBD
Undergraduate TA:	TBD

*Office hours and locations may change. Please check Blackboard for most up-to-date information.*

### 2. Course Description

Introduction to signals and systems. Manipulation of simple analog and digital signals. Relationship between frequencies of analog signals and their sampled sequences. Sampling theorem. Concepts of linearity, time-invariance, causality in systems. Convolution integral and summation; FIR and IIR digital filters. Differential and difference equations. Laplace transform, Z-transform, Fourier series and Fourier transform. Stability, frequency response and filtering. Provides general background for subsequent courses in control, communication, electronics, and digital signal processing.

Pre- or Corequisite: ESE 271

3 credits

### 3. Textbook

“Signals and Systems,” Alan V. Oppenheim, Alan S. Willsky, S. Hamid Nawab. Second edition, 1996, Prentice Hall. ISBN: 0-13-814757-4

A copy of the textbook is on hold at the Science and Engineering Reserve shelf in the North Reading Room at Melville Library.

### 4. Course Outline

This course covers the most basic theory of signals and systems, which are fundamental for most areas of electrical and computer engineering. The concepts are used in circuits, control, communications, signal processing and many other areas. Because of the wide applicability of the ideas, the course is theoretical and somewhat abstract.

We will cover the following topics in some detail:

1. Signals; continuous-time and discrete
2. Systems, especially linear, time-invariant systems
3. Convolution (continuous-time and discrete-time)
4. Frequency-domain description of signals; Fourier transform and Fourier series
5. Transform-domain and frequency-domain description of systems; Laplace transform
6. Discrete-time signals and systems and transforms; discrete-time Fourier transform (DTFT) and Z-transform; fast Fourier transform (FFT)
7. Realization, characterization, and identification of systems

## 5. Grading

Your grade will be based on assignments (homework and labs), two midterm examinations, and one final examination.

Assignments	30%
Midterm #1	20%
Midterm #2	20%
Final Exam	30%

## 6. Homework and Projects

Assignments will take the form of Homework and project work (Matlab). Assignments will be issued roughly weekly. A full schedule is available on Blackboard. (This schedule will be updated as needed.) All assignments will be due at the *beginning* of class on the assigned day. Please see the Late Homework Policy, below.

This class includes a project component using Matlab. During the first two weeks of class, you will complete a Tutorial assignment to teach you the basics. This will be due (on Blackboard) on September 8.

## 7. Collaboration Policy

You may *discuss* homework assignments with your classmates. (In fact, you are encouraged to do so.) However, you must write up your own solution individually without any help from any other person.

For example, it is fine if you and a friend discuss a problem together, and then separately work out the math and write your own separate solutions. On the other hand, it is not acceptable to share written solutions with another person or to collaboratively create the written solutions together. In other words, the work you turn in must entirely be your own personal effort. It may be helpful to keep in mind the difference between “working with others” and “copying answers.”

If you discuss homework problems with another person in the class, you must write "I discussed this assignment with..." and include the name(s).

For some Lab assignments, you will be sharing work with a partner (when explicitly allowed), but otherwise the same spirit applies. You may not under any circumstances share code with anyone except your partner, but you may discuss ideas with others. Please note: your exams will include questions about the labs, so it is important that you understand all labs independent of your partner.

## 8. Academic Honesty

Any academic dishonesty on the homework or labs will result in a zero grade for the assignment for all parties involved.

All exam work must be entirely your own with no collaboration or outside materials/information. Any academic dishonesty on the midterm exams or the final exam will result in failing the course. The case will be submitted to the College of Engineering's Committee on Academic Standing and Appeals.

## 9. Late Homework Policy

Each student will be given two "late days" for homework assignments. Each late day can be used to turn in one homework assignment one day late. You may not use both late days on one assignment.

Homework assignments are due at the beginning of class (10:00am). Any assignment turned in **after 10:15am** will be considered one day late. **If you are out of late days, no late homework will be accepted.**

Each calendar day counts as one late day. For example, if an assignment is due Thursday at 10:00am, you may turn it in to Prof. Milder by 10:00am on Friday with one late day. To submit an assignment "late," please bring it to Prof. Milder's office (Light Eng. 231). If he is not there, please slide it under the door.

All homework assignments must be turned in on paper.

Late days may not be used on labs.

You can check the number of late days you have remaining on Blackboard. (It is listed in the Gradebook section.)

## 10. Piazza: Online Discussion Forum

This term we will be using Piazza for class discussion. The system is highly catered to getting you help fast and efficiently from classmates, the TA, and myself. Rather than emailing questions to the teaching staff, I encourage you to post your questions on Piazza. On the first day of classes, you will receive a signup link sent to your @stonybrook.edu email address. Find our class page at: <http://piazza.com/stonybrook/fall2017/ese305>

## 11. Schedule

Classes will be held in Javits 111. Class will meet from 4:00–5:20pm on Tuesdays and Thursdays.

Mid-term exams will be given in class on 10/5 and 11/9. The final examination will be given on Monday December 18 from 2:15pm to 5:00 pm.

A full schedule is available on Blackboard. This schedule lists each lecture, its topics, and the corresponding sections of the text. The schedule will be updated as needed.

## 12. Student Learning Outcomes

- an ability to apply knowledge of mathematics, science, and engineering
- an ability to identify, formulate, and solve engineering problems
- an ability to use techniques, skills, and modern engineering tools necessary for engineering practice

## 13. Electronic Communication Statement

Email and especially email sent via Blackboard (<http://blackboard.stonybrook.edu>) is one of the ways the faculty officially communicates with you for this course. It is your responsibility to make sure that you read your email in your official University email account. For most students that is Google Apps for Education (<http://www.stonybrook.edu/mycloud>), but you may verify your official Electronic Post Office (EPO) address at <http://it.stonybrook.edu/help/kb/checking-or-changing-your-mail-forwarding-address-in-the-epo>.

If you choose to forward your official University email to another off-campus account, faculty are not responsible for any undeliverable messages to your alternative personal accounts. You can set up Google Mail forwarding using these DoIT-provided instructions found at <http://it.stonybrook.edu/help/kb/setting-up-mail-forwarding-in-google-mail>.

If you need technical assistance, please contact Client Support at (631) 632-9800 or [supportteam@stonybrook.edu](mailto:supportteam@stonybrook.edu).

## **14. Disability Support Services (DSS) Statement**

If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Disability Support Services, ECC Building, room 128, (631) 632-6748. They will determine with you what accommodations, if any, are necessary and appropriate. All information and documentation is confidential.

Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and Disability Support Services. For procedures and information go to the following web site: <http://www.stonybrook.edu/ehs/fire/disabilities>

## **15. Academic Integrity Statement**

Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty are required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Technology & Management, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at [http://www.stonybrook.edu/commcms/academic\\_integrity/index.html](http://www.stonybrook.edu/commcms/academic_integrity/index.html)

## **16. Critical Incident Management Statement**

Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Judicial Affairs any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures.