ECE 3054: Signals, Systems, and Transforms

Spring 2020
NYU Tandon School of Engineering
Department of Electrical and Computer Engineering

http://eeweb.poly.edu/iselesni/EE3054/
http://eeweb.poly.edu/iselesni/EE3054/lab/

Outline

1. Discrete-time signals and systems
2. Linear time-invariant systems
3. Discrete-time convolution
4. The Z transform
5. The Discrete-Time Fourier transform
6. Continuous-time signals and systems
7. Continuous-time convolution
8. The Laplace transform
9. Fourier analysis for continuous-time signals
10. The Sampling theorem

Texts

1. *Signals & Systems: Theory and Applications* by Ulaby and Yagle (Free download)
   http://fet.eecs.umich.edu/
   http://ss2.eecs.umich.edu/
2. A course packet is available on the course website. The packet contains exercises, the labs, additional notes and examples.

Other texts - optional/reference

1. *The Schaum's outline of Signals and Systems* by Hwei Hsu, McGraw-Hill, 1995. ISBN: 0-07-030641-9.
2. *Signals and Systems* by Oppenheim and Willsky. Publisher: Prentice Hall
3. *Signal Processing First*, by J. H. McClellan, R. W. Schafer, and M. A. Yoder. Publisher: Pearson - Prentice Hall

Prerequisites

Differential Equations or Linear Algebra and Differential Equations (MA 2034)

Instructor

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Homework

HW will be assigned weekly. It is important to do the HW promptly to learn the material, to check your understanding, to keep up with the course, and to do well on the quizzes and tests. ** * Late HWs will not be accepted. * **

Lab

Lab will meet every week. The lab will consist of computer-based exercises using MATLAB. You must bring your laptop to the lab, with MATLAB installed on your computer. The TA will view your progress and engagement during the lab session. At the end of each lab session, you will show your work to the TA.

Lab reports will be submitted on NYU Classes. Students may work together on the labs, however, each student must write up their lab report on their own.

Two lab quizzes will be given. The first lab quiz will cover elementary MATLAB commands. The second lab quiz will cover concepts from lectures and labs together with MATLAB usage. The labs and additional information are on the web at: http://eeweb.poly.edu/iselesni/EE3054/lab/

** * Late lab reports will not be accepted. * **

Software

MATLAB is a required software package for this course. NYU students can download MATLAB.

https://www.nyu.edu/life/information-technology/getting-started/software/matlab.html

https://www.mathworks.com/academia/tah-portal/new-york-university-618777.html

Also, a student version of MATLAB is available online at www.mathworks.com for $99.00. This version includes the Signal Processing Toolbox.

MATLAB manuals are available in PDF format at www.mathworks.com. More Matlab tutorials are available on the web at http://eeweb.poly.edu/iselesni/Matlab/

The earlier in the semester you become comfortable with MATLAB, the better. Read through the MATLAB tutorials.

Quizzes

There will be a quiz nearly every week. Each quiz will cover the previously due homework assignments. Because the material each week builds upon previous course material, each quiz can be considered cumulative.

Quizzes will be closed book, closed notes. **No graphing calculators** are allowed at quizzes or exams. Cell phones are not allowed. Cell phones may **not** be used as calculators or clocks, etc. Cell phones must be put into bags/backpacks and placed at the front of the exam room.

Grading

The following grading scheme (subject to change) will be used to compute the weighted average for each student. The course grade will be based on the weighted average.

Grades will be posted in the online grade book. You may monitor your progress in the course grade book.

Homework	10 %
Lab reports	10 %
Matlab quizzes	10 %
Final exam	20 %
Quizzes	50 %

In the event of academic dishonesty, a score of zero may be given for the item. Additionally, the grade for the course may be reduced, including a failing grade for the course.

Moses Center Statement of Disability

If you are student with a disability who is requesting accommodations, please contact New York University's Moses Center for Students with Disabilities (CSD) at 212-998-4980 or mosescsd@nyu.edu. You must be registered with CSD to receive accommodations. Information about the Moses Center can be found at http://www.nyu.edu/csd. The Moses Center is located at 726 Broadway on the 3rd floor.

NYU School of Engineering Policies and Procedures on Academic Misconduct

Introduction: The School of Engineering encourages academic excellence in an environment that promotes honesty, integrity, and fairness, and students at the School of Engineering are expected to exhibit those qualities in their academic work. It is through the process of submitting their own work and receiving honest feedback on that work that students may progress academically. Any act of academic dishonesty is seen as an attack upon the School and will not be tolerated.

Furthermore, those who breach the School's rules on academic integrity will be sanctioned under this Policy. Students are responsible for familiarizing themselves with the School's Policy on Academic Misconduct.

Definition: Academic dishonesty may include misrepresentation, deception, dishonesty, or any act of falsification committed by a student to influence a grade or other academic evaluation. Academic dishonesty also includes intentionally damaging the academic work of others or assisting other students in acts of dishonesty. Common examples of academically dishonest behavior include, but are not limited to, the following:

1. Cheating: intentionally using or attempting to use unauthorized notes, books, electronic media, or electronic communications in an exam; talking with fellow students or looking at another person's work during an exam; submitting work prepared in advance for an in-class examination; having someone take an exam for you or taking an exam for someone else; violating other rules governing the administration of examinations.
2. Fabrication: including but not limited to, falsifying experimental data and/or citations.
3. Plagiarism: intentionally or knowingly representing the words or ideas of another as one's own in any academic exercise; failure to attribute direct quotations, paraphrases, or borrowed facts or information.
4. Unauthorized collaboration: working together on work that was meant to be done individually.
5. Duplicating work: presenting for grading the same work for more than one project or in more than one class, unless express and prior permission has been received from the course instructor(s) or research adviser involved.
6. Forgery: altering any academic document, including, but not limited to, academic records, admissions materials, or medical excuses.