

DEPARTMENT OF ELECTRICAL & COMPUTER ENGINEERING (ECE)

University of Washington

Autumn Quarter 2018

Course: EE P 502A

Title: Analytical Methods for Electrical Engineering

Credit: 4 Units

Time: Lecture is on Wednesdays, 6:00-7:50 PM in EEB 105; help session is on Wednesdays, 8:00-8:50 PM in EEB 105.

Course Goal: This course is a review of the analytical methods you learned in your undergraduate studies.

Instructor: Yana Sosnovskaya (4th year PhD student, graduate researcher at Biorobotics Lab, conducting research in surgical robots, email: ysos@uw.edu)

Instructor Office Hours: Monday (6pm - 8pm), room Sieg Hall 128

Teaching Assistant: Jared Nakahara (PhD student, email: jarednak@uw.edu)

TA Office Hours: Saturday (1pm – 2:30pm), room Sieg Hall 128

Graders: 2nd year PMP student, Harshit Kyal (email: harshitk@uw.edu)

Homework: There will be weekly homework (eight over the quarter).

Labs: There will also be four MATLAB labs due over the quarter. Report is required for all labs with submitted separate .m-files. If no report is submitted, student will get -15% penalty for the lab.

Late policy: Every late day deducts -10% for Labs/homework. No homework and Labs will be accepted after **3 days late**.

Recommended textbooks (optional):

- Alan V. Oppenheim, Alan S. Willsky, “*Signals and Systems*”, 2nd edition.
- Hwei P.Hsu, “*Signals and Systems*”, Schaum’s outlines, 3rd edition.

Topics/Approximate time table:

- 1. September 26:** Course introduction, Math review, Signals and Classification of Signals, Introduction to MATLAB; Hand out Problem Set 1, Lab 1, and optional Problem Set 0.
- 2. October 3:** Continuous-time signals and systems. Problem Set 1 due. Hand out Problem Set 2.
- 3. October 10:** Continuous-time signals and systems: Convolution Integral. Problem Set 2 and Lab 1 due. Hand out Problem Set 3 and Lab 2.
- 4. October 17:** Fourier Series. Problem Set 3 due. Hand out Problem Set 4.
- 5. October 24:** Fourier Transform. Problem Set 4 and Lab 2 due. Hand out Problem Set 5 and Lab 3.
- 6. October 31:** Discrete-time linear systems. Problem Set 5 due. Hand out Problem Set 6.
- 7. November 7:** Discrete-time linear systems: Convolution Sum. Problem Set 6 and Lab 3 due. Hand out Problem Set 7.
- 8. November 14:** Frequency-Selective Filters. RC filters for real-time signal processing. Problem Set 7 is due. Hand out Lab 4 and Problem Set 8.
- 9. November 21:** Thanksgiving, No class =)
- 10. November 28:** Basic image processing, 2D convolution. Role of image processing in Computer Vision. Lab 4 due.
- 11. December 5:** Additional advance topic and course wrap up. Hand out final exam which is take-home and will be due during Finals' Week. Problem Set 8 due.

Grading:

- 1. Problem Sets:** 40%
- 2. Labs:** 30%
- 3. Final Exam:** 20%
- 4. Participation:** 10% (participation in optional quizzes, answering on student's questions on canvas page, etc.)

Access and Accommodations for students with disability: Your experience in this class is important to me. If you have already established accommodations with Disability Resources for Students (DRS), please communicate your approved

accommodations to me at your earliest convenience so we can discuss your needs in this course.

If you have not yet established services through DRS, but have a temporary health condition or permanent disability that requires accommodations (conditions include but not limited to; mental health, attention-related, learning, vision, hearing, physical or health impacts), you are welcome to contact DRS at 206-543-8924 or uwdrs@uw.edu or disability.uw.edu. DRS offers resources and coordinates reasonable accommodations for students with disabilities and/or temporary health conditions. Reasonable accommodations are established through an interactive process between you, your instructor(s) and DRS. It is the policy and practice of the University of Washington to create inclusive and accessible learning environments consistent with federal and state law.