General Course Information

Staff

Lecturer:
Prof. Vivek K Goyal (vgoyal@mit.edu), Room 36-690, ×4-0367
Office hours: Mondays 3-4pm in Room 36-462

Teaching Assistant:
Serhii M. Zhak (zhak@mit.edu), Room 38-280, ×2-2279
Office hours: Tuesdays noon-1pm and Fridays noon-1pm in Room 24-322

Course Secretary:
Eric Strattman (ejstratt@mit.edu), Room 36-615 (×3-4021) and Room 36-680 (×4-7677).

Note: Missed handouts are not available from the course secretary. They can be found in the appropriately labeled file cabinet in the 6th floor lobby of Building 36, across from the elevators.

Lectures

Lectures: Monday and Wednesday 11:00 am – 12:30 pm  Rm. 1-150
A separate handout gives the tentative schedule of lecture topics. If there are significant changes, the schedule will be updated on the course website.

Texts

There is no required textbook to purchase. Portions of the manuscript

_The World of Fourier and Wavelets_, M. Vetterli, J. Kovačević, and V. K. Goyal,

will be handed out in class and will be the primary text.

Suggested References:

Prerequisites

The primary course prerequisites are Linear Algebra (18.06) and Discrete-Time Signal Processing (6.341) or Principles of Digital Communications (6.450), or the consent of the instructor. That said we will relax the 6.341 or 6.450 prerequisite to a strong grasp of the materials and concepts covered in the following chapters of the 6.341 text (Oppenheim and Schafer with Buck):

- Chapter 2: Discrete-Time Signals and Systems
- Chapter 3: The z-Transform
- Chapter 4: Sampling of Continuous-Time Signals

The first two problem sets provide a basis for reviewing some of this background.

It is important to understand clearly that this is an advanced graduate subject. Consequently, in addition to the formal prerequisites, we assume you have an interest in and commitment to understanding concepts in depth. Therefore there will only be four HW problem sets, one midterm and no final. We do, however, expect a significant and novel term project.

Office Hours

The staff encourages your participation during office hours and will announce any deviations in availability. Under unusual circumstances it is possible to arrange a brief meeting with the lecturer or TA outside the specified times.

Web page

The class web page is located at:

http://web.mit.edu/6.342/www

This page will transfer you to the class Stellar web site. You must be registered for the class and have your MIT Personal Certificate to access the web site. If you are listening in on the class, please email the TA so that you will be allowed access to the site.

Exam

There will be one exam half way through the semester. The exam will be conceptual and comprehensive, and will cover material through Lecture 15 and Problem Set 4. The exam date (put it into your calendar now!) is:

Midterm Exam: Wednesday, April 11 7:30 pm – 10:00 pm Room 36-155

The exam is in the evening so that we can reduce (nearly eliminate) time pressure. More details will be provided well in advance of the exam.

There will not be a final exam, as we expect you to submit a significant term project at the end of the semester.
Homework

Homework assignments will generally be handed out in lecture on Wednesdays and be due two weeks later; see attached schedule for specifics. Some parts of the homework may involve MATLAB exercises. It is assumed that you already have some familiarity with MATLAB.

There will be approximately 4 problem sets, assigned every other week in the first half of the semester. Do not be misled by the relatively few points assigned to homework grades in the final grade calculation. While the grade that you get on your homework is at most a minor component of your final grade, working the problems is a crucial part of the learning process and will invariably have a major impact on your understanding of the material (and, in turn, your exam performance and final grade!).

Moderate collaboration in the form of joint problem solving with one or two classmates is permitted and even encouraged provided your write-up is your own. In making up the exams and in assigning final grades, we will assume that you have worked all the assigned problems.

Problem sets must be handed in at the beginning of the lecture in which they are due, and solutions will be available at the end of the lecture on the same days. Consequently, late problem sets cannot be accepted. Each problem set that you turn in will be given a score of 0, 1, or 2. A score of 2 is given for a good effort on all or most of the problems (even if not with uniform success); 1 for a reasonable attempt, but with significant gaps; and 0 when there is little evidence of any original thought or effort. For additional feedback on the problems, come to any of the staff’s open hours after you have had a chance to look through the solutions we hand out.

MATLAB-Based Homework Exercises

One of the best ways to learn much of the material in this course is to explore the main concepts with MATLAB. Each problem set, in addition to traditional homework problems, will have MATLAB-based problems or sections of problems. To access MATLAB on Athena, type:

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add matlab
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Course Grade

The final grade for the course is based on our best assessment of your understanding of the material, as well as your commitment and participation. The exam, problem sets, and term project are combined with the following rough weighting to give a preliminary final grade:

- Problem Sets: 15%
- Midterm: 35%
- Term Project: 50%

However, this provides only a starting point for assigning the final grade. Other factors, such as interaction with the staff and participation in lecture, can make a difference in the final grade. We know that the final grade is important to you and we take the process seriously.