

PURDUE UNIVERSITY
School of Electrical and Computer Engineering
ECE 438 Digital Signal Processing with Applications
Course Information
Fall 2007

Prerequisites: ECE 301 and ECE 302

Instructor: Professor Charles Bouman
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Class: MWF 10:30 -11:20 AM; EE 117

Laboratories: Lab 1: T 7:30 AM - 10:20 AM; MSEE 184
Lab 2: T 11:30 AM - 2:20 PM; MSEE 184
Lab 3: Th 2:30 PM - 5:20 PM; MSEE 184

Course Web Site: <http://www.ece.purdue.edu/~bouman/ee438>

Lab Web Site: <http://www.purdue.edu/vise/ee438L>

Required Text:

None. Course notes will be posted on the course web site.

Recommended Texts:

Digital Signal Processing, 3rd edition, John G. Proakis and Dimitris G. Manolakis, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, ISBN 0-13-373762-4, 1996.

Digital Signal Processing, 2nd edition, Sanjit K. Mitra, McGraw-Hill, New York, NY, ISBN 0-07-252261-5, 2001.

Course Outcomes:

A student who successfully fulfills the course requirements will have demonstrated:

- i. an understanding of linear time invariant systems;
- ii. the ability to manipulate discrete parameter signals;
- iii. knowledge of how to use linear transforms;
- iv. the ability to apply linear system analysis to engineering problems.

Lecture:

It is essential that you attend the lecture and take complete and accurate notes. While this is generally a good idea with any course, it is particularly important in this course, because there does not exist a textbook containing all of the material that we will cover.

Homework:

Homework will be assigned on a weekly basis, except the first week, exam weeks, and Thanksgiving break. Assignments will be due on Friday in class. They will be distributed on the preceding Friday. No late assignments will be accepted. Your lowest homework score will be dropped.

Only one or two problems will typically be graded on each homework. Therefore, if you do not attempt every problem on a homework, you may receive a zero for that homework (on the other hand, if you only solve one problem, there is a chance that you will get full points for the whole homework).

The homework is a very important part of the course. You may read your lecture notes and the text, and think that you understand the material. However, when you attempt to work the homework problems, you will frequently find that you actually did not understand the material as well as you thought you did. Also, the problems on the exams will often be similar to the homework problems.

Rules for Preparing your Solutions:

It will be to your benefit in terms of maximizing your grade, and will be greatly appreciated by us if you adhere to the following four rules when preparing your assignments:

- 1) Do not use paper torn out of a spiral bound notebook.
- 2) Write on only one side of each page.
- 3) Put the problems in the proper order.
- 4) Staple the pages together before turning in the assignment.

MATLAB:

Knowledge of the MATLAB software environment will be a required part of this course. MATLAB is an integral part of the laboratory and will be required for solving many weekly homework assignments.

If you choose to work with others on MATLAB homework assignments, you must list all collaborators' names at the top of the assignments. Remember that you will be responsible for knowing MATLAB in exams, so you are encouraged to work as independently as possible.

Laboratory:

The laboratory is in Room MSEE 184, the Video and Image Systems Engineering (VISE) Lab. You will be assigned to a 3 hour lab session which you must attend each week during the entire semester. You must attend and attempt the labs to pass the course since you do get an hour of lab credit. All laboratory material is available at the web site listed at the top of this handout. You are responsible for printing out and reviewing the labs in advance of your laboratory session. Each lab session (except for the labs during the first week of the semester) will begin with a quiz covering the basic concepts underlying that week's experiment or related lecture material. ***All lab sections will meet during the first week of the semester.***

You will also be able to use the laboratory to work on ECE 438 homework or laboratory experiments during periods when it is not scheduled for use. Please observe the rules for laboratory use posted at the lab web site.

PLEASE DO NOT REBOOT VISE MACHINES UNDER ANY CIRCUMSTANCES!

These machines are often used to run computationally intensive numerical simulations for various research projects. These jobs are run in the background and sometimes take days and even weeks to complete. Rebooting one of these machines will discontinue all its background jobs and can therefore be very damaging to various faculty and graduate students. If your workstation is “frozen” please report it to your TA and move to another workstation.

Examinations:

There will be three 50-minute in-class exams. The dates for these exams are fixed and cannot be changed:

EXAM 1: September 21 10:30-11:20 AM

EXAM 2: October 19 10:30-11:20 AM

EXAM 3: November 16 10:30-11:20 AM

Please schedule your plant trips and interviews so that they do not conflict with the exams. There will be no makeup examinations. All examinations will be closed book.

Help Session:

We will be holding a weekly help session. During the weeks of midterm exams, the help sessions will serve as a review for the exam. You will benefit from attending this help session, not only because you can get answers to your questions; but also because you can learn what questions your classmates have, and what the answers are for those questions, as well.

Computation of Final Grade:

Your final grade will be determined as a weighted combination of the homework, laboratory, midterm exams, and final exam. Your letter grade will be based solely on your weighted final grade. This means that failure to do the homework or laboratory assignments can definitely hurt your grade, regardless of how well you do on the exams.

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| Laboratory | 15% |
| Homework | 10% |
| Three midterm exams (15% ea.) | 45% |
| Final exam | 30% |

If you dispute your grade on any homework or exam, you have *one week* from the date that the graded paper was returned to you to request a change in the grade. After this time, no further change in grade will be considered. When you return your paper for a re-grade, please attach a sheet to the front, indicating where you think that your paper was graded incorrectly. Also, date the sheet. We reserve the right to re-grade the whole paper. ***Only written re-grade requests will be considered, both for homeworks and for exams.***

Academic Dishonesty

The ECE faculty expect every member of the Purdue community to practice honorable and ethical behavior both inside and outside the classroom. Any actions that might unfairly improve a student's score on homework, quizzes, labs, or examinations will be considered cheating and will not be tolerated. Examples of cheating include (but are not limited to):

- Sharing results or other information during an examination.
- Bringing forbidden material or devices to an examination.
- Working on an exam before or after the official time allowed.
- Requesting a re-grade of answers or work that has been altered.
- Submitting homework or lab report that is not your own work or engaging in forbidden homework or lab collaborations.
- Possession of another person's laboratory solutions or report from the current or previous years.
- Reference to, or use of another person's laboratory solutions or report from the current or previous years.
- Allowing another person to copy your laboratory solutions or work.
- Representing as your own work anything that is the result of the work of someone else.

Academic dishonesty will likely result in a failing grade for the entire course. Please note that after the exam papers are graded, they may be copied; therefore, requesting a re-grade of an exam which has been altered will automatically result in a failing grade for the course. All occurrences of academic dishonesty will be reported to the Assistant Dean of Students and copied to the ECE Assistant Head for Education. If there is any question as to whether a given action might be construed as cheating, please see the professor or the TA before you engage in any such action.

Students are encouraged to discuss homework problems with each other; however, the final write-up of the solution should be your own work. Handing in a machine or hand copied version of another student's homework solutions is considered a form of academic dishonesty.

Please also refer to the laboratory ethics guidelines at <http://www.purdue.edu/vise/ee438L/lab0/pdf/lab0.pdf>

Web Site:

Copies of all class handouts including this one will be available at the ECE 438 web site <http://www.ece.purdue.edu/~bouman/ee438> .