

PURDUE UNIVERSITY
School of Electrical Engineering
EE 438 Digital Signal Processing with Applications
Class Information
Fall 1995

Prerequisites: EE 301 and EE 302

Lecturer: Professor Charles A. Bouman
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Office hours: WF 12:30-1:30 or by appointment

Required Texts:

Discrete-Time Signal Processing, Alan V. Oppenheim and Ronald W. Schaffer, Prentice-Hall International, Inc., Englewood Cliffs, New Jersey, ISBN 0-13-216771-9.

Digital Signal Processing Applications, edited by J. P. Allebach, C. A. Bouman, and M. D. Zoltowski, (Custom text available from Follett's book store on West State Street).

Supplementary Text:

A supplementary text entitled "Digital Signal Processing Applications" edited by J. P. Allebach, C. A. Bouman and M. D. Zoltowski will be available in Follett's book store on West State Street. This text will supplement lecture material on image and speech processing.

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 the text does not contain all of the material that we will cover. We will not necessarily do everything the same way that it is done in the text. On questions of terminology, definitions *etc.*, your lecture notes should be relied upon, not the text.

Homework:

Homework will be assigned on a weekly basis. Assignments will be due on Friday at 5:00 PM. Solutions will be handed out on the following Monday. The assignments will be graded and returned to you on the following Friday. There will be no homework assignments due on the week that an exam is given. No late assignments will be accepted for any reason. However, your lowest homework grade will be dropped as discussed below under Computation of Final Grade.

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 be very similar to the homework problems. Needless to say, your understanding of the material will not be improved if you simply copy your solutions from a friend. You will benefit most from the homework if you attempt to do the problems *before* consulting your friends. While it is perfectly reasonable to discuss your approach to solving the problems with a friend, the final write-up of the solution should be your own work.

The grader will have to handle a lot of paperwork for the course, and wade through many pages of handwritten 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 4 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.

Rules for Computer Use:

Rules for the Suns/HPs in MSEE:

- 1) Workstations are to be used for class work/research only; not for games, hours of reading news/mail, etc.
- 2) No remote logins between 8am and 11:30pm; You can remotely log into *1* workstation outside those hours.
- 3) Workstations may not be screen locked for more than 10 minutes (should be long enough to go to the bathroom, but little else).
- 4) Read and observe signs posted in the labs which may have additional rules/policies on them.

Matlab:

Knowledge of the Matlab software environment will be a **required** part of this course. Matlab will be required for solving many weekly homework assignments, and it will also be very useful in the course project. If you are not familiar with Matlab, you are strongly encourage to attend one of the following two ECN short courses:

- 1) *Introduction to Matlab*, Tuesday, September 5th ; 1:30 - 2:30pm; MSEE B12
- 2) *Advanced Matlab*, Tuesday, September 19th ; 1:30 - 2:30pm; MSEE B12
- 3) *Simmulink*, Check ECN short course schedule for time and date.

Matlab will be available in two forms. Version 4.2C will be available on the unix workstations on the first floor of the MSEE building. In addition, you will be able to obtain a full scale version of Matlab for the Macintosh or Windows environment. This includes Simmulink, but no additional toolboxes. As part of the license agreement, you will be required to distroy the software at the end of the semester. To obtain a copy, do the following:

- 1) Buy a price card at the University Book Store or Follett's on West State Street. Specify Mac (5 disks and is \$7.83) or Windows (4 disks is \$6.88) version of Matlab.
- 2) Present your price card and your validated student schedule (to show proof of enrollment in EE 301 or EE 348) at the EE Shop when you pick up the software. You will also need to sign the Matlab Classroom agreement. In order for the software to be installed, you will also need the serial number for the software license. Mac: 39131; Windows: 353184.

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

Laboratory:

The laboratory is in Room EE 63. You will be assigned lab hours which you will observe 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. Each laboratory will consist of a prelab that will be collected at the start of the laboratory period and graded. In addition, you will be required to turn in a sheet recording your in-lab activities.

Examinations:

There will be 3 hour exams. The dates for these exams are fixed as indicated on the attached syllabus, and cannot be changed. **No exams can be made up, or taken early.** Make sure that you will be available to take exams. If you have a conflict with an exam schedule in another

class, report the conflict within the first week of class. **Job interviews, conflicts with other university activities are not considered valid excuses for missing an exam.** If you miss an exam, your exam grade will be recorded as 0, and your final exam will count for that portion of your grade, as discussed below. Always obtain approval from the instructor prior to missing an exam. All examinations will be closed book. No crib sheets will be permitted. However, some tables or formulas may be provided. This will be announced in advance of the exam. Each exam will typically contain 4 or 5 problems that are similar to homework problems. Please schedule your plant trips and interviews so that they do not conflict with exams.

Computation of Final Grade:

Your final grade will be determined as a weighted combination of the homework, laboratory, hour exams, and final exam. Your lowest homework grade will be dropped. If your lowest hour exam grade is less than your final exam grade, then the grade for that exam will be replaced by your final exam grade. 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.

Laboratory	
Formal labs	17%
Design Project	8%
Homework	8%
3 Hour Exams (15% ea.)	45%
Final exam	22%

If you dispute your grade on any homework or hour 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 regrade, please attach a sheet to the front, indicating where you think that your paper was graded incorrectly. Also, date the sheet.

Design Project:

As part of the laboratory, students will work in teams of four on a semester-long design project requiring trade-offs between performance and ``cost". This semester's project will be on tomographic reconstruction, and will require that you develop computationally efficient algorithms for producing high quality images from object projections. The design task will permit a wide variety of solutions, so each design team is likely to make different tradeoffs in their solution to the problem. At the end of the course, additional open laboratory periods will be available so that groups may work on the projects.