ECE 320
Course Overview Handout

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Lecture: Monday 2:00, 269 Everitt Lab

Lab: 251 Everitt Lab, 244-1360
Mon., Fri.: 3–5
Tue., Wed., Thurs.: 2–4

Web page: http://www.ews.uiuc.edu/~ece320

Recommended Text: Texas Instruments, *TMS320C54X DSP Reference Set Volume 1: CPU and Peripherals, Volume 2: Mnemonic Instruction Set*, and *Volume 4: Applications Guide*. These documents are available in PDF and PS formats on the course web page in the "handouts" section and are also available in hard copy in the lab. It is not necessary to purchase any texts for this course, and we ask that you **do not** print the manuals on the lab printer.

Office hours: Office hours are held in the lab. Times will be announced later.

1 Introduction

The intent of this course is to familiarize students with the fundamentals of operating and analyzing real-time digital signal processing (DSP) systems including the theory required, the hardware used to sample and process the signals, and the software environment used to control the system. The theory is primarily those DSP concepts covered in ECE 310 including sampling, convolution, filtering, filter-design, modulation, and multirate processing (interpolation and decimation). The DSP hardware consists of an analog-to-digital (A/D) and digital-to-analog (D/A) converters and a TI-549 DSP to perform the processing.

2 Schedule

The first half of the course consists of semi-self-paced labs in which you will learn the specifics of the TI-54X DSP, its assembly language, and its compilers. For the second half of the semester, you are to select and complete a real-time DSP-related project. Note in the schedule below that, except for the first week of class, a "lab week" starts on a Tuesday and ends on the following Monday.

Dates	Lecture	Lab	Requirements
Jan. 14 – 21	Introduction	Lab 0: Lab Orientation	
Jan. 22 – 28	TI Assembly Language	Lab 1: FIR Filtering	
Jan. 29 – Feb. 4	FIR / IIR Filters	Lab 2: IIR Filtering	*Lab 1 oral quiz*
Feb. 5 – 11	Compilers	Lab 3: Multirate FIR Filtering	*Lab 2 oral quiz*
Feb. 12 – 18	FFTs	Lab 4: Spectrum Analyzer	*Lab 3 oral quiz*
Feb. 19 – 25	Digital Communications	Lab 5: Digital Communications	*Lab 4 oral quiz*
Feb. 26 – Mar. 4	Special Topics	continue Lab 5	
Mar. 5 – 11	Special Topics	Project Lab 1	*Lab 5 oral quiz* *Project Abstract Due*
Mar. 12 – 25	Special Topics	Project Lab 2	*Project quiz 1*
Mar. 26 – Apr. 1	Special Topics	Project Topic Feedback	*Project quiz 2*
Apr. 2 – 8	Special Topics	Design Review Presentations	*Review Slides Due*
Apr. 9 – 15	Special Topics	Project	*Pass Design Review*
Apr. 16 – 22	Special Topics	Project	
Apr. 23 – 29	Special Topics	Project	
Apr. 30 – May 1			*Project Demonstrations*
May 1			*Project Reports Due*

3 Grading

The structured laboratory segment will count for 50% of the total grade, based on completion of, and oral examination over, the weekly exercises with each student quizzed individually. Labs are worth 10 points, usually with 1 point for prelab completion, 4 points for working code, and the remaining 5 points for quiz performance. We emphasize that grading in this class is based heavily on your demonstration of course material, rather than exams or submitted assembly code.

The project will count for 50% of the total grade, with 20% of the total grade dependent on technical work on and oral demonstration of the project, and 10% of the grade dependent on the completeness and quality of the design review, 10% for the final report and 5% each on project labs.

It is expected that each student will attend and participate in scheduled class and laboratory meetings and report on progress, or will make **prior** other arrangements with the instructor or T.A.s. The final grade may be penalized if this does not occur.

Assignments: All graded assignments, including prelab exercises, DSP code, and final project materials, must be submitted to receive a grade in the course. All assignments other than the final report and presentation are due at the start of your scheduled laboratory meeting. You must have your code complete before the class begins on the day the lab will be quizzed. We reserve the right to consider code late if it is not complete before the start of the lab session in which it is due. A late penalty of 50% will be assessed for assignments less than a week late, and no credit will be given for assignments more than one week late. In addition to these policies, the final project abstract must be submitted and approved before project labs or project work are accepted for grading. Similarly, the design review must be passed before demonstration, report submission, or grading of the final project is allowed.

Quizzes: All lab quizzes must be taken during the lab on the day the lab is due. You must take the quiz during your assigned laboratory period even if your lab assignment is not complete. Any quiz not taken during its assigned laboratory period will be assigned a zero grade unless other arrangements are made in advance with your section TAs or Professor Bresler. Exceptions to this policy will be granted only for excuses recognized by the College of Engineering.

4 Lab Access

We will meet in the lab for two hours during the week at the assigned times. In addition, you will be able to access the lab at any time during the semester using a keycard.

Completion of your lab assignments will generally entail additional lab time outside of the scheduled hours. Basic rules of courtesy must be followed when in the lab. Please do not remove any lab equipment, books or manuals from the lab at any time. Do not bring food or drink into the lab. If you would like to listen to music as you work, please use headphones.

Keycard Access: Off-hour lab time is available by way of keycard access into Everitt Lab as well as the DSP Lab through room 251. Those students who currently have keycards should already have their cards activated for the DSP lab. If you are registered for the class and do not have a keycard, please request one in room 153 E.L..