

Boston University
Department of Electrical and Computer Engineering
EC401 SIGNALS AND SYSTEMS

Information Sheet

Professor:	Prakash Ishwar, pi@bu.edu Pho440, 8 St. Mary's Street, 617-358-3499, (e-mail is more reliable)										
Office Hours:	WR 8:30-9:30am										
Teaching Assistant:	Andy (Zhu) Chen, chenz@bu.edu Pho424, 8 St. Mary's Street, 617-353-0175, (e-mail is more reliable)										
Discussions:	MTW (see website for detailed schedule and exceptions)										
Office Hours:	WRF (see website for detailed schedule and exceptions)										
Class:	TR 12-2, Pho210										
Laboratory:	MF Pho307 (see website for detailed schedule and exceptions)										
Web Site:	http://courseinfo.bu.edu/courses/09fallengec401_a1/index.html										
Required Text:	Oppenheim, Willsky & Nawab, "Signals & Systems," 2 nd Ed, Prentice Hall, 1997, ISBN:0-13-814757-4										
Prerequisites:	CAS MA 226 Differential Equations ENG EK 307 Electric Circuit Theory										
Homework/Labs:	<p>Homework will be assigned roughly weekly. They are for you to clear up your confusions with the material through extended thought, to develop proficiency through practice, and to learn the concepts. They must be handed in by the date they are due. <u>No late homework will be accepted.</u> Doing the homework will be <u>essential</u> to your understanding of the material. Do not wait until the last minute before starting the homework!</p> <p>MATLAB Laboratory exercises will be assigned roughly bi-weekly. They are for you to gain practical exposure to the concepts in the class. They should take roughly 1-2 hours and not be black holes of effort!</p>										
Exams:	<p>There will be 2 exams during the semester and a final during the final exam period. At present these are scheduled on the following dates:</p> <p>Midterm 1 – Thursday October 8 Midterm 2 – Thursday November 12 Final – Saturday December 19, 9am</p>										
Grading:	<table><tr><td>Homework</td><td>20%</td></tr><tr><td>Laboratory</td><td>10%</td></tr><tr><td>Midterm 1</td><td>20%</td></tr><tr><td>Midterm 2</td><td>20%</td></tr><tr><td>Final</td><td>30%</td></tr></table>	Homework	20%	Laboratory	10%	Midterm 1	20%	Midterm 2	20%	Final	30%
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Final	30%										

Course Policies

Academic Conduct:

The student handbook defines Academic Misconduct as follows: "Academic misconduct occurs when a student intentionally misrepresents his or her academic accomplishments or impedes other students' chances of being judged fairly for their academic work. Knowingly allowing others to represent your work as theirs is as serious an offense as submitting another's work as your own." This basic definition applies to SC401. If you are ever in doubt as to the legitimacy of an action, please talk to me immediately. The penalties for plagiarism at BU are severe.

Make-ups

There will be no make-up exams. If you have a legitimate excuse, such as illness as documented by a doctor's note, then the scores of your other exams will be weighted more highly to compensate for the missed exam. If you do not have a legitimate excuse, you will be given a grade of zero for the exam.

Incompletes

Incompletes will not be given to students who wish to improve their grade by taking the course in a subsequent semester. An incomplete may be given for medical reasons where a doctor's note is provided. The purpose of an incomplete is to allow a student who has essentially completed the course and who has a legitimate interruption in the course, to complete the remaining material in another semester. Students will not be given an opportunity to improve their grade by doing "extra work".

Homework, Dates, Etc.

Homeworks are due by the end of the day on the date stated. Late homeworks will not be accepted. No homework scores will be dropped.

Students are responsible for being aware of the drop dates for the current semester. Drop forms will not be back-dated.

Course Objectives

Provide students with:

- A thorough understanding (and appreciation!) of the nature of continuous and discrete signals and their applications in engineering.
- Knowledge of common terminology
- Experience in the characterization of signals and systems
- Understanding and experience in the use of transform methods for signal classification and system analysis

Course Syllabus

	Topic Description	# Lect	Reading
I	Fundamental Signal and System Representations and Properties <ul style="list-style-type: none"> • Signal properties, representation and manipulation. System properties, and Linear Time-Invariant (LTI) systems 	3	Chapters 1 and 2
II	The Fourier Series <ul style="list-style-type: none"> • Decomposition of continuous periodic signals. Properties, examples and applications 	3	Chapter 3
III	The Fourier Transform <ul style="list-style-type: none"> • Representation of aperiodic signals. Discrete-time and continuous time transforms. Properties, examples and applications. 	4	Chapters 4 and 5
IV	Time and Frequency Characterization of Signals <ul style="list-style-type: none"> • Magnitude and phase representation. Time and frequency domain analysis 	2	Chapter 6
V	Sampling and Reconstruction <ul style="list-style-type: none"> • The sampling theorem. Sampling and reconstruction with examples. Effects of undersampling/aliasing. 	3	Chapter 7
VI	The Laplace Transform <ul style="list-style-type: none"> • The transform and inverse transform. Properties and applications. Analysis of continuous-time systems. 	4	Chapter 9
VII	The Z-Transform <ul style="list-style-type: none"> • The transform and inverse transform. Properties and applications. Analysis of discrete-time systems. 	2	Chapter 10
VIII	Linear Feedback Systems <ul style="list-style-type: none"> • Examples. Applications of feedback. Systems analysis and stability. 	2	Chapter 11

Course Schedule

Labs		Homeworks				
Out	Due	Out	Due	Lec #	Date	Comment
1		1		1	R 9/3	First class
2	1	2	1	2 3	T 9/8 R 9/10 F 9/11	
	2	3	2	4 5	T 9/15 R 9/17 F 9/18	
3		4	3	6 7	T 9/22 R 9/24 F 9/25	
	3		4	8 9	T 9/29 R 10/1 F 10/2	
		5		10	T 10/6 W 10/7 R 10/8	Last day to drop w/o a "W" Exam #1
4		6	5	11	T 10/13 R 10/15 F 10/16	No class due to Monday schedule
	4	7	6	12 13	T 10/20 R 10/22 F 10/23	
5		8	7	14 15	T 10/27 R 10/29 F 10/30	
	5		8	16 17	T 11/3 R 11/5 F 11/6	
		9		18	T 11/10 R 11/12	Exam #2, Last day to drop w/ a "W"
		10	9	19 20	T 11/17 R 11/19 F 11/20	
				21	T 11/24 W 11/25	Thanksgiving Break
6		11	10	22 23	T 12/1 R 12/3 F 12/4	
	6		11	24 25	T 12/8 R 12/10 F 12/11	Last day of classes
				F	Sat 12/19	Final 9-11am
Winter Break						

Reading

Chapter 1:	Sections 1.0-1.7
Chapter 2:	Sections 2.0-2.4, 2.6 Optional: Section 2.5 on singularity functions
Chapter 3:	Sections 3.0-3.3, 3.5-3.8, 3.12 Optional: Sections 3.9-3.11
Chapter 4:	Sections 4.0-4.6, 4.8
Chapter 5:	Sections 5.0-5.6, 5.9
Chapter 6:	Sections 6.0-6.2
Chapter 7:	Sections 7.0-7.4, 7.6 Optional: Sections 7.5
Chapter 8:	Sections 8.0-8.5
Chapter 9:	Sections 9.0-9.8, 9.10
Chapter 10:	Sections 10.0-10.8, 10.10