

# RYERSON UNIVERSITY

Department of Electrical and Computer Engineering

**ELE532 - Signals and Systems- Winter 2006**

Course Information

www.ee.ryerson.ca/~courses/ele532/

## PROFESSORS:

Name	Office	Ext.	Email	Counseling Hours
Prof. Javad Alirezaie	ENG 452	6092	jalireza@ee.ryerson.ca	TBA
Prof. Soosan Beheshti	ENG 425	4906	soosan@ee.ryerson.ca	TBA

## LECTURE HOURS:

Sections	Monday	Tuesday	Wednesday	Thursday	Friday
1, 2, 3, 4	10:00am-11:00am				11:00am-1:00pm
5, 6, 7, 8	10:00am-11:00am				12:00pm-2:00pm

## COURSE STRUCTURE:

This course deals with a number of important new concepts. It builds on the basic mathematics courses of your first two years to develop a foundation for the analysis and design of engineering systems. It is important not only to understand the concepts, but also to be able to apply them in modeling and problem solving contexts. We believe the best way for you to learn and be able to use this material is to get as much first-hand, active experience with it as possible. To that end, this course will be combination of lecture segments and tutorial/labs in a sort of workshop/problem solving environment. We will use the lecture segments to introduce the ideas and set up the problems. You will then have the opportunity to work in the labs and tutorials to explore the ideas and solve the problems in a setting where you can get immediate help and feedback from the instructor as needed. Of course, additional problems from the text, as will be given in the lectures, and should be done as homework to further reinforce the material. You will benefit most from the class session by having read the relevant sections of the text in advance.

Homework problems will be assigned in class and posted on the course web page. Solutions to homework will be provided in Tutorial sessions. Quizzes will be given in class according to the schedule provided below. There will not be any make up quizzes for any missed Quizzes. There will be a closed book midterm test during the lecture period and also a 3-hour closed book final exam.

## COURSE OUTLINE AND PLAN:

1. Representations of signals.
2. Representations of linear time-invariant systems.
3. Continuous-time signals and systems analysis.
4. Transfer function; impulse response; step response.
5. The convolution integral and its interpretation.
6. Laplace transforms.
7. Fourier analysis for continuous-time signals and systems.

## PREREQUISITES:

**Mathematics:** The course is fairly mathematical and students should have a good grasp of complex numbers and complex functions.

**Basic calculus:** Function limit (L'Hospital's rule), continuity differential calculus (Differentiating functions, investigating functions with the help of first and second derivatives), integral calculus (indefinite integrals, definite integrals). Elements of linear algebra (vectors, arrays).

**Engineering:** Basic linear circuit theory (RLC circuits), input/output Transfer Function, Sinusoidal steady-state transient response.

REQUIRED TEXTBOOK	<b>Linear Systems and Signals, by B.P. Lathi, second edition 2005, ISBN: 0195158334.</b>
OPTIONAL TEXTBOOK	<b>Signals and Systems, M. J. Roberts, McGraw Hill, 2004, ISBN: 0-072930446.</b>

## FROM THE TEXTBOOK:

Signals and Systems Representations	<b>Chapter 1</b> (1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7)
Time-domain Analysis of Continuous-time Systems	<b>Chapter 2</b> (2.1, 2.2, 2.3, 2.4, 2.6, 2.8, 2.9)
Continuous-time Signal Analysis: The Fourier Series	<b>Chapter 6</b> (6.1, 6.2, 6.3, 6.4)
Continuous-time Signal Analysis: The Fourier Transform	<b>Chapter 7</b> (7.1, 7.2, 7.3, 7.4, 7.5, 7.6, 7.7, 7.8, 7.9)
Sampling: Discrete Time Signals	<b>Chapter 8</b> (8.1, 8.2, 8.3, 8.4)
The Laplace Transform	<b>Chapter 4</b> (4.1, 4.2, 4.4, 4.6)

## COURSE EVALUATION:

<b>Quizzes</b> (~bi-weekly: 4 x 3%)	12%	September <b>18</b> ; October <b>2</b> ; November <b>6, 20</b>
<b>Labs</b> (~bi-weekly: 4 x 3%)	12%	Starting week of <b>September 18, 2006</b>
<b>Midterm Test</b>	26%	Tentatively, Friday <b>October 20, 2006</b>
<b>Final Exam</b>	50%	T.B.D

## IMPORTANT NOTE:

- It is the students' responsibility to regularly check the course web page for updates and announcements

## NOTE: Ryerson University Policy

- "All of the required course specific written reports will be assessed not only on their technical or academic merit, but also on the communication skills of the author as exhibited through these reports."
- "All students are required to activate and maintain a Ryerson University central Matrix e-mail account which shall be an official means by which they will receive University communications." It is also recommended that, where possible, students utilize these accounts for communicating with their instructors.
- The course evaluation will be carried out in week 10-11 of the semester.