The course introduces continuous-time (analogue) signals including an analysis and design of continuous-time systems. After reviewing core concepts in complex numbers, trigonometry, and functions, the course considers three alternate representations (differential equations, impulse response, and Laplace/Fourier transfer function) for linear, time invariant (LTI) systems in the continuous-time domain. The analysis of LTI systems is covered for each of the three representations. Frequency-selective filters are introduced as a special class of LTI systems for which design techniques based on Butterworth, Chebyshev, and Elliptic filters are covered. Applications of continuous-time systems in communications and controls are also presented. Three hours per week lectures and three hours per week lab work and tutorials. Prerequisites: General Prerequisite; SC/MATH 1014 3.00, SC/MATH 1025 3.00. Course credit exclusions: LE/EECS 3451 4.00, LE/SC/CSE 3451 4.00. (NOTE: The General Prerequisite is a cumulative GPA of 4.50 or better over all major EECS courses. EECS courses with the second digit "5" are not major courses.)

LIST OF LEARNING OUTCOMES AND EXAMPLES OF Course Learning Outcome

By the end of the course, the students will be able to:
- Describe a physical process in terms of signals and systems, and describe the properties.
- Calculate the frequency representations of periodic and aperiodic CT signals.
- Compute the steady state outputs of linear time-invariant systems in the continuous-time domain using three different but equivalent techniques: (i) solving differential equations, (ii) convolution with the impulse response, and; (iii) the Fourier (or, alternatively, the Laplace) transform.
- Represent a CT linear time invariant system using its magnitude and phase spectrum.
- Design CT frequency selective filters based on given specifications for the system.
- Analyze practical applications in controls and communication systems using the analysis techniques covered in the course.
- Represent CT signals/systems as discrete-time signals/systems and use MATLAB to analyze and design the CT signals/systems for selected real-world applications.

GRADED ASSESSMENT

The weight distribution of the course components is as follows:
- 10 marked assignments - 1% each, 10% in total
- 4 labs in total - 5% each, 20% in total
• 3 in-class quizzes - 5% each, total 15%
• Midterm test - 20%
• Final exam - 35%

Conversion from numeric to letter grade is applied to the overall mark only and in accordance with the following departmental standard:

<table>
<thead>
<tr>
<th>Grade</th>
<th>F</th>
<th>E</th>
<th>D</th>
<th>D+</th>
<th>C</th>
<th>C+</th>
<th>B</th>
<th>B+</th>
<th>A</th>
<th>A+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Score</td>
<td>&lt;40</td>
<td>&gt;40</td>
<td>&gt;50</td>
<td>&gt;55</td>
<td>&gt;60</td>
<td>&gt;65</td>
<td>&gt;70</td>
<td>&gt;75</td>
<td>&gt;80</td>
<td>&gt;90</td>
</tr>
</tbody>
</table>

ADDITIONAL INFORMATION

You will require the following textbook for this course:
• Mrinal Mandal and Amir Asif, "Continuous and Discrete Time Signals and Systems"
• The book is available at York Bookstore.

ACADEMIC INTEGRITY LINKS
• Senate Policy on Academic Honesty
• Academic Integrity

STUDENT LINKS
• Student Rights and Responsibilities
• Religious Observance
• Academic Accommodation for Students with Disabilities
• Counselling and Disability Services

Many courses utilize Moodle, York University's course website system. If your course is using Moodle, click here to access it.
Moodle @ York University