Course number
ENGR2410

Course title
Signals and Systems

Semester(s) covered
Spring 2013

Instructor
José Oscar Mur-Miranda, jomm@olin.edu, (781)292-2544

Course Assistants
Dan Kearney, Sasha Sproch, Patrick Varin, Jason Zhu

Designation as ‘required’ or ‘elective’ course
Required electrical and computer engineering core

Course (catalog) description
Linear system theory is a powerful set of mathematical tools used broadly across science and engineering. Signals represent the transfer of information or power, while systems represent operations on these signals. This course presents fundamental concepts from linear systems such as convolution, impulse and step response, Fourier transforms, sampling and modulation. These concepts are presented within the framework of linear operators and/or transforms in discrete and/or continuous time. Applications include filters, system identification, deconvolution, feedback and control, and communications.

Prerequisites
Modeling and Control and First-year physics and math or equivalent

Recommended reference textbook(s)

Course website
http://faculty.olin.edu/jmurmiranda/sigsys/2013/index.htm

Course objectives
By the end of the course, the students should be able to:
• Understand the concept of a transform.
• Analyze 1st and 2nd order systems using frequency domain concepts and techniques.

**Topics covered**
• 1st and 2nd order step, impulse and frequency response
• Transfer function and its relation to the impulse response
• Fourier and Laplace transforms
• Pole/zero representation of linear, time-invariant (LTI) systems
• LTI system stability
• Power and energy in LTI systems
• Applications such as filters, modulation, and sampling

**Class/laboratory schedule and location**
MR 1 pm - 2:50 pm in AC304

**Relationship of course to program outcomes (Olin competencies) and method of assessment**
Extensive development of Quantitative Analysis at an intermediate level will be assessed through 10 problem sets (3% each dropping the two lowest scores, 24% total), 8 quizzes (8% each dropping the two lowest scores, 48% total), a project (18%), and a 10% professionalism grade to be determined by the course staff.

**Course policies**
Students are expected to arrive on time to class and remain engaged while in the classroom. Laptops will be closed during class. All work must be clear, intelligible and neat. Students may collaborate on problem sets problems, but the work handed in must be individual and reflect the individual’s own effort and understanding. Problem sets are due at the end of the day on Monday. The score for late problem sets will decrease 1 point out of 10 every day late with a maximum penalty of 5 points. The two lowest problem set scores will be eliminated to allow for unforeseeable circumstances. **Collaboration is not allowed on quizzes.** Quizzes are due at the end of lecture on Thursday and limited to one continuous hour of individual work. Students may only use a page of notes during the quizzes. **Late or missed quizzes will be given a score of zero. Any excuses must come directly from the Office of Student Life.** The two lowest quiz scores will be eliminated to allow for unforeseeable circumstances. In case of doubt, students are expected to base their behavior on the values expressed in the Honor Code.

**Classroom assessment**
As implied in the “Do Something” clause of the Honor Code, students will be expected to be active stewards of their learning and provide feedback as necessary. The instructor will also hold feedback sessions with the students at regular intervals.

**Person(s) who prepared this description**
José Oscar Mur-Miranda

**Date of preparation**
January 21, 2013