

## Mathematics of Engineering Systems

Classes held at Stirling Hall 412A, Mon 8:30-9:20, Tue 10:30-9:20, Thu 9:30-10:20 Tutorial session, Tue 17:30-18:20, Room TBA.

### Course Information

This course is concerned with the mathematical foundations of systems theory and its practical use in signal processing, communications and control system applications.

- Instructor: Serdar Yüksel, Jeffrey Hall 415, Phone: 533-2429, E-mail: [yuksel@mast.queensu.ca](mailto:yuksel@mast.queensu.ca)
- Marker and TA: TBA
- Office Hour: Tuesdays: 13:00-14:00
- Text: *Modern Signals and Systems*, by H. Kwakernaak and R. Sivan,  
(Copies of this book are available at the Queen's Bookstore)  
Supplemental Notes will be posted on the course web site
- References: Math 334 Lecture Notes by Andrew D. Lewis  
*Signals and Systems*, A. V. Oppenheim, A. S. Willsky and S. Nawab
- Announcements: Visit <http://www.mast.queensu.ca/~math335> regularly for announcements, homeworks etc.
- Grading: Homework Assignments 15%; Project 7.5%, Midterm 35% each, Final 42.5%

### Topics

- Signals and Transformations
- Normed Spaces, Hilbert Spaces
- Projection Theorem and Orthogonal Bases
- Fourier Series
- Distribution Theory and Weak Convergence
- Systems
- Fourier, Z and Laplace Transforms
- Applications in Signal Processing: Estimation, Sampling Theorem and Digital Filtering
- Applications in Communications: Modulation, Multiplexing and Information Transmission
- Applications in Automatic Control: Feedback and Stability