COURSE CALENDAR DESCRIPTION

This course introduces fundamental concepts, principles and algorithms of digital signal processing (DSP), including DFT, FFT, digital filter design and analysis of digital systems. It also covers some selected DSP applications, such as embedded DSP system design, speech and audio processing, image processing, etc. Three lecture hours per week. Twelve supervised laboratory hours. Prerequisites: General prerequisite; LE/EECS 3451 4.00 or LE/EECS 3602 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.)

INSTRUCTOR(S)

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<th>Name</th>
<th>Section / Format / Term</th>
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<tr>
<td>Hooshyar, Ali</td>
<td>Sec. M / LECT / W</td>
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TOPICS AND CONCEPTS

The topics to be covered may include:

Part A
- DSP theory Review of discrete-time systems and sampling
- Review of Z-transforms
- Discrete Fourier transform (DFT)
- Fast Fourier transform (FFT)
- Digital filter design - classical filter theory, FIR filters, IIR filters, filter banks, adaptive digital filters, spectral estimation and analysis

Part B: DSP applications (selectively covered by the instructor)
1. Embedded DSP systems: Introduction to DSP processors, architecture and programming, design of embedded DSP systems with TMS320 series
2. Speech and audio processing: Digital waveform coding: PCM, u-law, A-law, Time domain analysis, Short-time spectrum analysis, Linear prediction analysis, Pitch detection and tracking, Speech coding, Music processing
3. Image processing: Two-dimensional signals and systems, Image compression, Image enhancement and restoration, radar and sonar signal processing: array signal processing

This course is designed to cover most of DSP theory and algorithms and some selected important DSP applications. In lab projects, students will design and implement some DSP systems in selected application areas, such as speech and audio processing or image processing, by using either particular DSP hardware (such as TMS 320 series DSP chips) or software simulation, to get hands-on experience of DSP system design.

ADDITIONAL INFORMATION
ACADEMIC INTEGRITY LINKS
- Senate Policy on Academic Honesty - http://secretariat-policies.info.yorku.ca/policies/academic-honesty-senate-policy-on/
- Academic Integrity - http://lassonde.yorku.ca/academic-integrity

STUDENT LINKS
- Student Rights and Responsibilities - http://oscr.students.uit.yorku.ca/student-conduct
- Religious Observance - https://w2prod.sis.yorku.ca/Apps/WebObjects/cdm.woa/wa/regobs
- Counselling and Disability Services - http://cds.info.yorku.ca/

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