Digital Signal Processing

Department of Electronic Engineering
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Syllabus Outline

- **Foundations of Digital Signal Processing (DSP)**
  DSP Overview, Analog Signal Analysis, Discrete-Time Signals and Systems, Sampling and Reconstruction of Analog Signals

- **Discrete-Time Signal Analysis Tools**
  z-Transform, Discrete-Time Fourier Transform (DTFT), Discrete Fourier Series (DFS), Discrete Fourier Transform (DFT)

- **Digital Filters**
  Realization and Design of Finite Impulse Response (FIR) Filters and Infinite Impulse Response (IIR) Filters

- **Application Case Studies**
  Interference Cancellation, Spectral Analysis
Intended Learning Outcomes

On completion of this course, you will be able to

- Classify discrete-time signals and systems
- Convert signals between continuous-time and discrete-time domains
- Explain the relationship between different discrete-time signal analysis tools
- Analyse discrete-time signals and systems using appropriate transforms
- Design digital filters according to predefined specifications such as filter shapes, passband ripple and frequency as well as stopband attenuation and frequency
- Realize digital filters using different structures
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<thead>
<tr>
<th>Date</th>
<th>Lecture</th>
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<tbody>
<tr>
<td>13 Jan.</td>
<td>Lecture 1</td>
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<td>20 Jan.</td>
<td>Lecture 2</td>
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<td>Test 1</td>
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<td>Test 2</td>
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## Assessment

### Coursework:
- 2 Assignments: 6%
- 2 MATLAB Exercises: 8%
- 2 Tests: 26%

### Examination:
60%

To pass the course, at least 35% of coursework AND examination marks are required. All tests and examination are open book format.

**Act of academic dishonesty** (e.g., plagiarism, submission for assessment of material that is not your own work) will be liable to disciplinary actions.
Book List

Textbook:

References:
MATLAB Resources


http://www-h.eng.cam.ac.uk/help/tpl/programs/matlab.html
