The University Of Sheffield.

Electronic & Electrical Engineering.

EEE6033 DIGITAL SIGNAL PROCESSING

Credits: 10

Course Description including Aims

1. To introduce fundamental ideas of digital signal processing (DSP), its limitations and its advantages.
2. To give the student a working knowledge of basic DSP operations, as well as a solid theoretical understanding of their behaviour.
3. To make the student aware of the options available when constructing a DSP system.

Outline Syllabus

Discrete-time signals and systems, z-transform, sampling of continuous-time signals, discrete-time Fourier transform (DTFT), transform analysis of linear time-invariant (LTI) systems, structures for discrete-time systems, discrete Fourier transform (DFT), fast Fourier transform (FFT), finite impulse response (FIR) filter design techniques: window method and frequency sampling method, infinite impulse response (IIR) filter design techniques: impulse invariance method and bilinear transform method.

Time Allocation

24 hours of lectures

Recommended Previous Courses

EEE201 “Signals and Systems”

Assessment

2 Hour Examination

Recommended Books

Ifeachor & Jervis	*Digital Signal Processing - A practical approach*	(Addison-Wesley)
Proakis & Manolakis	*Digital Signal Processing - Principles, algorithms and applications, second edition*	(Macmillan student edition)
Meddins, B	*Introduction to digital signal processing*	(Newnes)
Mulgrew, Grant and Thompson	Digital signal processing : concepts and applications	(Palgrave Macmillan)
Oppenheim and Schafer	Discrete-time Signal Processing	(Prentice Hall)

Objectives

At the end of the course, the student will be able to

1. Understand the necessary changes of choosing a digital solution when processing signals.
2. Understand and exploit the relationship between the time and frequency domain representations of linear time-invariant (LTI) discrete-time systems and the signals passing through them.
3. Design simple FIR and IIR filters to satisfy desired performance specifications.
4. Demonstrate a broad knowledge of well-known digital signal processing tools.