

Communications Signal Processing

Description

An introductory course aimed at early stage post-graduate students and industry practitioners wishing to “re-learn” many of the issues and techniques used in today’s communication system implementations.

The course focuses on the fundamental aspects that every communications engineer should know, most of which are equally applicable in wire-line, wireless, and optical communication fields. A broad range of topics are covered ranging from linear system theory and modelling to communication theory fundamental theorems and on to some real world implementation considerations.

The course is delivered by: Prof. A.D. Fagan, Dr. M. Flanagan, and Dr. B. Cardiff all from the School of Electrical, Electronic & Communications Engineering, University College Dublin.

Dates: Monday 16th Dec to Friday 20th Dec 2013
Times: Monday-Thursday: 10:00-12:00 & 14:00-16:00
Friday: 10:00-12:00 only
Location: Room G6, Daedalus Building,
University College Dublin,
Belfield,
Dublin 4.

Course Outline

Section I: Basic signals & systems

- Fourier & Laplace transforms
- Difference equations
- Linear Time Invariant (LTI) systems
- Filters
- Discrete Fourier Transform (DFT)
- Fast Fourier Transform (FFT)

Section II: Digital communications

- AWGN channel
- Modulation schemes
- Error performance
- Pulse shaping
- Matched filtering
- Forward Error Correction (FEC)
- Frequency selective channels
- Signal carrier equalization (Viterbi)
- CDMA
- OFDM

Section III: Implementation issues

- Basic RF architectures
- Non-ideal considerations
- Digital Rx / Tx components
- AFC
- AGC
- Symbol timing