

Information and Codes (CO349)

Coding and Decoding

Herbert Wiklicky
herbert@doc.ic.ac.uk

Department of Computing
Imperial College London

Autumn 2016

Slide 1 of 5

Information and Codes

What will be covered in this course?

- Data and Information Representation
- Data and Information Transmission

We will look at these problems from a quantitative, statistical point of view as well as from an algebraic point of view.

In German, Dutch, Italian, etc: CS is Informatik – Informatica
Information Science rather than **Computer Science**.

Slide 2 of 5

Practicalities

Two Lecturers

Herbert Wiklicky

h.wiklicky@imperial.ac.uk

Teaching $4\frac{1}{2}$ weeks until 31 October

Open-book coursework test on **28 or 31 October**

Mahdi Cheraghchi

m.cheraghchi@imperial.ac.uk

Teaching $4\frac{1}{2}$ weeks from 4 November

Open-book coursework test on **?? November**

Exam: Week 11, **16 December 2016**, 2 hours (3 out of 4).

Different classes, different background, different applications.

Slide 3 of 5

Overview – Information (Theory)

Part I: Information Theory

- Simple Codes and Coding
- Revision: Probabilities
- Information Representation
- Information Transmission
- Information Manifestation

Part II: Coding Theory

- Revision: Linear Algebra
- Linear Codes
- Algebraic Error-Correcting Codes
- Information in Cryptography

Slide 4 of 5

Text Books

- Norman L. Biggs: *Codes - An Introduction to Information, Communication and Cryptography*, Springer 2008.
- Ron Roth: *Introduction to Coding Theory*, Cambridge University Press, 2006.
- David Applebaum: *Probability and Information*, Cambridge University Press, 1996/2008.
- Robert McEliece: *The Theory of Information and Coding*, Cambridge University Press, 2002.
- T.M. Cover, J.A. Thomas: *Elements of Information Theory*, Wiley-Interscience, 2006.
- Robert B. Ash: *Information Theory*, Wiley 1965, reprint: Dover 1980.