The University Of Sheffield.

Electronic & Electrical Engineering.

EEE317 PRINCIPLES OF COMMUNICATIONS

Credits: 10

Course Description including Aims

This course considers the theory and techniques used by a wide range of communication systems, particularly the more recent digital systems.

The main aim is to create a theoretical background that applies to all communication systems and is not affected by any particular technology.

Outline Syllabus

Noise in AM and FM Modulation Systems. Comparison of analogue and digital modulation techniques. Matched filtering. Information and entropy. M-Ary signaling. Error correction. Spread spectrum objectives and techniques. PN codes. Examples of digital communication systems. Guest lecturer material will provide information on design of modern systems and commercial context.

Time Allocation

24 lectures plus 12 hours of additional support material.

Recommended Previous Courses

Mathematical knowledge equivalent to AMA242 "Mathematics III" is useful. Knowledge equivalent to EEE206 "Communication Systems" is essential

Assessment

2 hour examination, answer 3 questions from 4

Recommended Books

Sklar, B	*Digital Communications, 2nd ed*	Prentice-Hall
Young, P.H	*Electronic Communication Techniques, 3rd ed*	Prentice-Hall
Ziemer	*Introduction to digital communications, 2nd ed*	Prentice-Hall
Benoit	*Digital television, 2nd ed*	Elsevier

Objectives

By the end of the unit a successful student will be able to

1. Calculate the signal to noise performance for a range of analogue modulation systems.

2. Understand that the signal to noise performance of an FM system can change abruptly with received signal strength, and the benefits of pre-emphasis and de-emphasis FM systems.

3. Understand what is meant by a matched filter as well as being familiar with various implementations thereof.

4. Understand what is meant by information and entropy, as well as some techniques to increase effective signalling speed of a channel.

5. Calculate the probability of error and know of some techniques to improve the error performance of a communications link.

6. Demonstrate familiarity with the properties and use of PN codes.

7. Display knowledge of some basic SS architectures and the benefits they offer.

8. Show awareness of some forms of M-Ary signalling and the inherent trade-offs between signalling speed and bandwidth efficiency.

9. Understand how the architecture and mode of operation of a COFDM system improves performance.