ECE-809
Digital Communications
Spring 2005

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Introduction

- Objective:

  Communicating a stream of information bits point-to-point through a physical channel.

- Performance Metrics:
  1. Reliability ("Performance" in Fitz's notes.)
     - How often are bits received in error?
  2. Spectral Efficiency
     - How many bits/sec per Hz of bandwidth?
  3. Complexity
     - Translates into cost.

- Performance Limits:

  Shannon established achievable limits on the rate of "reliable" (error free) communication, but did not show how to achieve them in practice. They provide us with a benchmark to measure how good any particular communication scheme is.

Course Format:

- Will rely heavily on Fitz notes; not enough time to cover every detail in class.
- Can expect regular homeworks, a midterm exam, and a final exam.

Course Outline:

1. Complex baseband representation
2. Optimal single-bit communication
3. Optimal multi-bit communication
4. Reduced complexity demodulation
5. Spectrally efficient transmission
6. Frequency selective channels
7. Modulation with memory
8. Maximum likelihood demodulation