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# Digital Communications B

## Finalità

To describe the theoretical foundation of the modern digital communication systems and the elements necessary to their design.

## Programma

**Part 1**

**Transmission systems with memory**

General model of modulated signals. Sequence detection. Error probability evaluation for receivers based on sequence detection. Continuous phase modulations. Trellis-coded modulations. Reduced-state sequence detection. Linear and decision-feedback equalization.

**Part 2**

**Advanced topics**

Sequence detection in the presence of unknown parameters. Per-survivor processing. Turbo codes and iterative decoding. Factor graphs and the sum-product algorithm. Low-density parity-check codes. Space-time codes.

## Attività d'esercitazione

Solution of previously assigned problems.

## Modalità d'esame

Written and oral exam.

## Propedeuticità

None

## Testi consigliati

G. Colavolpe, R. Raheli, Lezioni di Trasmissione numerica, Monte Università Parma editore, 2004.

J. R. Barry, E. A. Lee, D. G. Messerschmitt, Digital communication (third edition), Springer, 2004..

U. Madhow, Fundamentals of digital communication, Cambridge University Press, 2008.