



# Digital Communications

## Telecommunications Engineering

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## Author



Marcelino Lázaro

Marcelino Lázaro was born in Carriazo, Cantabria, Spain, in 1972. He received the “Ingeniero de Telecomunicación” and “Doctor Ingeniero de Telecomunicación” degrees from the Universidad de Cantabria, Spain, in 1996 and 2001, respectively.

From 1996 to 2002, he was with the Departamento de Ingeniería de Comunicaciones, Universidad de Cantabria. In 2003, he joined the Departamento de Teoría de la Señal y Comunicaciones (*Signal Theory and Communications Department*), at Universidad Carlos III de Madrid, Spain, where currently he is an Associate Professor. His research interest includes digital signal processing, detection, estimation, and statistical learning methods.

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## Objectives of the subject

To study the main methods and techniques applied in digital communication systems:

- Digital modulation formats
  - ▶ Linear modulations
  - ▶ Non-linear modulations (angle modulations)
  - ▶ Multipulse modulations
- Design of digital receivers in channels with linear distortion
  - ▶ Optimal receiver
  - ▶ Sub-optimal receivers (channel equalizers)
- Error-protection techniques for errors introduced by the channel
  - ▶ Detection and/or correction of errors

## Organization of the subject

- 1 Introduction
- 2 Pulse amplitude (linear) modulations
- 3 Angle modulations
- 4 Design of digital communications receivers in the presence of intersymbol interference (ISI)
- 5 Multipulse modulations
- 6 Channel coding for error protection

# Bibliography

## Basic bibliography

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## Complementary bibliography

- B. Sklar. *Digital communications : fundamentals and applications*, Prentice Hall, 2001
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