

Academic Year: ( 2023 / 2024 )

Review date: 27-04-2023

Department assigned to the subject: Signal and Communications Theory Department

Coordinating teacher: KOCH , TOBIAS MIRCO

Type: Compulsory ECTS Credits : 3.0

Year : 1 Semester : 1

## OBJECTIVES

This course introduces students to classical communication systems and information theory. Students will acquire a profound understanding of:

- The fundamental elements and the probabilistic modeling of classical communication systems.
- The main information theoretic concepts and limits to analyze classical communication systems.
- The techniques used for modulation, encoding and decoding.

## DESCRIPTION OF CONTENTS: PROGRAMME

The topics covered in this course are as follows:

- 1) Fundamental elements and probabilistic modeling of classical communication systems.
- 2) Modern information theory: information measures, fundamental limits in Shannon's theory and quantum information.
- 3) Techniques for data modulation, coding and decoding.

## LEARNING ACTIVITIES AND METHODOLOGY

Lectures:

The basic concepts will be mainly taught at the blackboard.

Exercises:

In order to deepen the understanding of the taught material, every two weeks students have to hand in the solutions to a set of problems. These solutions will be graded from 1 to 10, the average grade over the whole semester will constitute part of the grade of the continuous assessment.

## ASSESSMENT SYSTEM

Continuous assessment:

Every two weeks, each student has to hand in the solutions to a set of problems. These solutions will be graded from 1 to 10, the average grade over the whole semester will constitute 40% the grade. Furthermore, at the end of the semester, there will be an exam, where each student is tested on the material taught in this course. The exam will constitute 60% of the grade.

Convocatoria extraordinaria:

There will an exam, where each student is tested on the material taught in this course.

<b>% end-of-term-examination:</b>	0
<b>% of continuous assessment (assignments, laboratory, practicals...):</b>	100

## BASIC BIBLIOGRAPHY

- Amos Lapidoth A Foundation in Digital Communication, Cambridge University Press, 2017
- John G. Proakis Digital Communications, McGraw-Hill, 2001
- Thomas M. Cover and Joy A. Thomas Elements of Information Theory, John Wiley & Sons, 2006

