



COURSE DETAILS

"TEORIA DEI SEGNALI"

SSD ING-INF/03

DEGREE PROGRAMME: BACHELOR DEGREE IN COMPUTER ENGINEERING

ACADEMIC YEAR: 2023-2024

GENERAL INFORMATION – TEACHER REFERENCES

TEACHER: **MULTIPLE STUDY COURSE**

PHONE:

EMAIL:

[SEE THE STUDY COURSE WEBSITE](#)

GENERAL INFORMATION ABOUT THE COURSE

INTEGRATED COURSE (IF APPLICABLE): N.A.

MODULE (IF APPLICABLE): N.A.

CHANNEL (IF APPLICABLE): N.A.

YEAR OF THE DEGREE PROGRAMME (I, II, III): II

SEMESTER (I, II): I

CFU: 9



REQUIRED PRELIMINARY COURSES (IF MENTIONED IN THE COURSE STRUCTURE "REGOLAMENTO")

Analisi matematica I.

PREREQUISITES (IF APPLICABLE)

None.

LEARNING GOALS

The aim of the course is to provide the basic tools for the analysis of deterministic signals and for their processing by systems (in particular linear systems) both in the time domain and in the frequency domain. A further objective is to introduce the basic concepts of probability theory.

EXPECTED LEARNING OUTCOMES (DUBLIN DESCRIPTORS)

Knowledge and understanding

The student must demonstrate to be able to classify and describe the signals of interest for engineering, both in the time domain and in that of frequency. Must demonstrate the ability to analyze simple signal processing schemes, particularly by means of linear systems. He must also demonstrate that he understands the random nature of many phenomena of interest to engineering and that he knows the fundamental aspects of probability theory.

Applying knowledge and understanding

The student must demonstrate that he is able to recognize problems that involve the analysis and processing of signals, choosing models appropriate to their description and solution. Must demonstrate the ability to size simple signal processing schemes, in particular by means of linear systems. He must also demonstrate that he can model and solve simple problems of a random nature with the tools of probability theory.

COURSE CONTENT/SYLLABUS

Deterministic signals: continuous-time and discrete-time signals, energetic characterization of signals, series and Fourier transform, band of a signal. Classification of systems: causality, stability, linearity, time-invariance. Time-invariant linear systems: filtering in the time and frequency domain, band of a system, linear and nonlinear distortion. Analog/digital and digital/analog conversion. Elements of probability theory. Random variables: complete and synthetic characterization of a variable, a pair of variables, a vector of random variables. Remarkable random variables.

READINGS/BIBLIOGRAPHY

Textbooks:

- E. Conte: "Lezioni di Teoria dei Segnali", Liguori.
- E. Conte, C. Galdi, "Fenomeni Aleatori", Liguori.
- G. Gelli: "Probabilità e Informazione", www.docenti.unina.it.
- G. Gelli, F. Verde: "Segnali e sistemi", Liguori.
- M. Luise, G.M. Vitetta: "Teoria dei segnali", III edition, 2009, McGraw-Hill.

Handouts:

- L. Verdoliva: "Appunti di Teoria dei Segnali", www.docenti.unina.it.

TEACHING METHODS

Teaching is provided for 100% with lectures, which include both theory and exercises.



EXAMINATION/EVALUATION CRITERIA

a) Exam type:

Exam type	
written and oral	X
only written	
only oral	
project discussion	
other	

In case of a written exam, questions refer to:	Multiple choice answers	
	Open answers	
	Numerical exercises	X

b) Evaluation pattern:

