

Signal Processing

Signal and Systems, Fourier, Laplace and Z Transforms

IDENTIFICATION

CODE : GE-3-S1-EC-SSMT
ECTS : 4.0

HOURS

Lectures : 25.0 h
Seminars : 30.0 h
Laboratory : 6.0 h
Project : 0.0 h
Teacher-student
contact : 61.0 h
Personal work : 30.0 h
Total : 91.0 h

ASSESSMENT METHOD

1h middle exam
2h final exam
1 report on laboratory exercise

TEACHING AIDS

lecture notes, manual of exercises
Matlab software

TEACHING LANGUAGE

French

CONTACT

M. DELACHARTRE Philippe
philippe.delachartre@insa-lyon.fr

AIMS

To provide the student with the basic background of signals, systems and usual transforms (Fourier, Laplace and Z) both for discrete-time and continuous-time.

SKILLS:

To master the mathematical tools for time and frequency study of signals and linear systems both for discrete-time and continuous-time: transforms (Fourier, Laplace, Z), convolution, differential and difference systems.

CONTENT

- 1- Transforms [13h lecture + 13h exercises]
Fourier ,
Laplace,
Z
- 2- Signals and systems overview [5h lecture + 4h exercises + 2h computer exercises]
- 3- Systems [10 h lecture + 8h exercises + 2h computer exercises + 3h laboratory exercises]
Systems properties,
impulse response,
convolution,
linear systems analysis,
frequency response
- 4- Feedback systems [2h lecture + 1h exercises].

BIBLIOGRAPHY

André Pacaud, signaux et systèmes linéaires, Technosup, Ellipses
Huibert Kwakernaak, Raphael Sivan - Modern Signals and Systems, Prentice Hall
Charles L. Phillips et al., Signals, systems and transforms, Pearson education
Willsky and Nawab, Signals and Systems, 2nd ed. by Oppenheim, Prentice Hall.

PRE-REQUISITE

undergraduate level, other lecture in the Electrical Engineering Department [e.g. GE-3-MA1].