

230691 - SPEE - Signal Processing for Electronic Engineering

Coordinating unit: 230 - ETSETB - Barcelona School of Telecommunications Engineering
Teaching unit: 739 - TSC - Department of Signal Theory and Communications
Academic year: 2017
Degree: MASTER'S DEGREE IN ELECTRONIC ENGINEERING (Syllabus 2013). (Teaching unit Compulsory)
ECTS credits: 5 Teaching languages: English

Teaching staff

Coordinator: Lamarca Orozco, M. Meritxell

Degree competences to which the subject contributes

Specific:

- CEE22. Ability to characterize deterministic and random signals in time or space, and in the frequency domain.
- CEE15. Ability to apply synchronization techniques and use standard buses considering electrical aspects and protocols.
- CEE21. Ability to process continuous variable signals using digital techniques.
- CEE23. Ability to analyze, model, identify and simulate linear systems, especially digital filters and adaptive systems.

Transversal:

- CT3. TEAMWORK: Being able to work in an interdisciplinary team, whether as a member or as a leader, with the aim of contributing to projects pragmatically and responsibly and making commitments in view of the resources that are available.
- CT5. FOREIGN LANGUAGE: Achieving a level of spoken and written proficiency in a foreign language, preferably English, that meets the needs of the profession and the labour market.

Teaching methodology

- Lectures
- Application classes
- Laboratory work
- Team work (distance)
- Individual work (distance)
- Exercises
- Short and extended answer tests (Partial and Final Exams)

Planning of activities:

Exercises:

- Description: Exercises to strengthen the theoretical knowledge.

Laboratory work:

- Description: Implementation of techniques in Matlab in teams.

Short answer test (Control):

- Description: Mid term control.

Extended answer test (Final exam):

- Description: Final examination test with theoretical questions and short exercises.

Learning objectives of the subject

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Learning objectives of the subject:

Understanding the concepts and techniques of the field of statistical signal processing, and their application to problems arising from real applications.

Learning results of the subject:

Depending on the student performance, partial achievement of the learning objectives.

Study load

Total learning time: 125h	Hours large group:	26h	20.80%
	Hours medium group:	0h	0.00%
	Hours small group:	13h	10.40%
	Guided activities:	0h	0.00%
	Self study:	86h	68.80%

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Content

1. Fundamentals of signal processing	Learning time: 32h Theory classes: 7h Laboratory classes: 3h Self study : 22h
Description:	
2. Digital filter design	Learning time: 31h Theory classes: 6h Laboratory classes: 4h Self study : 21h
Description:	
3. Basic estimation theory and spectral estimation	Learning time: 30h Theory classes: 6h Practical classes: 3h Self study : 21h
Description:	
4. Signal modelling and optimal filtering	Learning time: 32h Theory classes: 7h Laboratory classes: 3h Self study : 22h
Description:	

Qualification system

Final exam: from 40% to 50%
 Mid-term exam: from 10% to 30%
 Laboratory work from 10% to 30%
 Individual/team assessments: from 10% to 30%



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Bibliography

Basic:

Proakis, J.G.; Manolakis, D.G.. Digital signal processing: principles and algorithms. 4th ed. New Jersey: Prentice Hall, 2007. ISBN 0131873741.

Complementary:

Manolakis, D.G.; Ingle, V.K.; Kogon, S.M. Statistical and adaptive signal processing : spectral estimation, signal modeling, adaptive filtering, and array processing. Boston: Artech House, 2005. ISBN 1580536107.

Others resources:

Audiovisual material

Teacher's material: notes, problem sets, laboratory guides

Resource