

Course guide

230022 - PAV - Audio and Speech Processing

Last modified: 15/01/2024

Unit in charge:	Barcelona School of Telecommunications Engineering	
Teaching unit:	739 - TSC - Department of Signal Theory and Communications.	
Degree:	BACHELOR'S DEGREE IN TELECOMMUNICATIONS TECHNOLOGIES AND SERVICES ENGINEERING (Syllabus 2015). (Optional subject).	
Academic year: 2023	ECTS Credits: 6.0	Languages: Spanish

LECTURER

Coordinating lecturer:	Consultar aquí / See here: https://telecos.upc.edu/ca/estudis/curs-actual/professorat-responsables-coordinadors/responsables-assignatura
Others:	Consultar aquí / See here: https://telecos.upc.edu/ca/estudis/curs-actual/professorat-responsables-coordinadors/professorat-assignat-idioma

PRIOR SKILLS

Basic knowledge on audio processing
It is recommended to take or have taken the Machine Learning bachelor seminar

REQUIREMENTS

INTRODUCCIÓ AL PROCESSAMENT AUDIOVISUAL - Precorequisit

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Transversal:

07 AAT N3. SELF-DIRECTED LEARNING - Level 3. Applying the knowledge gained in completing a task according to its relevance and importance. Deciding how to carry out a task, the amount of time to be devoted to it and the most suitable information sources.

TEACHING METHODOLOGY

Expository classes
Laboratory classes
Group work (non-presential)
Individual work (non-presential)
Other activities
Exercises
Oral presentation
Long Answer Tests (Control)
Long Answer Tests (Final Exam)
Laboratory practice

LEARNING OBJECTIVES OF THE SUBJECT

The aim of the course is for the student to learn or deepen in the most common techniques for voice and audio processing as well as their use in problems of analysis, classification, synthesis or other types of processing.

Learning Outcome:

The subject contributes to the learning outcome specifically in the aspect of audio and voice information processing:

It has the capacity to build, operate and manage telecommunications services and applications, understood as capture systems, analog and digital processing, encoding, transport, representation, processing, storage, reproduction, management and presentation of audiovisual services and multimedia information.

He is familiar with the analysis, specification, operation and maintenance of television and audio systems, equipment, headers and installations, both in fixed and mobile environments.

It is able to carry out projects of premises and facilities for the production and recording of audio signals.

It has the ability to create, encode, manage, disseminate and distribute multimedia content, meeting the criteria of usability and accessibility of audiovisual, broadcast and interactive services.

In teamwork, plan and agree on goals, operating rules, responsibilities, agenda, and work review procedure.

Carry out the tasks based on the basic guidelines given by the teacher, deciding the time and resources needed. Assess your own strengths and weaknesses and act accordingly.

STUDY LOAD

Type	Hours	Percentage
Hours large group	39,0	26.00
Self study	85,0	56.67
Hours small group	26,0	17.33

Total learning time: 150 h

CONTENTS

(ENG) Tema 1. Introducció al processat de veu i àudio

Full-or-part-time: 2h 30m

Theory classes: 2h

Self study : 0h 30m

(ENG) Tema 2. El senyal de veu

Full-or-part-time: 6h 05m

Theory classes: 2h

Self study : 4h 05m

(ENG) Tema 3. Representacions de senyals de veu i àudio

Full-or-part-time: 21h 20m

Theory classes: 5h 20m

Self study : 16h



(ENG) Tema 4. Robustesa respecte a l'entorn acústic

Full-or-part-time: 25h 25m

Theory classes: 8h

Self study : 17h 25m

(ENG) Tema 5. Fonaments de la classificació de veu i àudio

Full-or-part-time: 16h

Theory classes: 8h

Self study : 8h

(ENG) Tema 6. Reconeixement de la parla

Full-or-part-time: 16h

Theory classes: 8h

Self study : 8h

(ENG) Tema 7. Síntesi de la parla

Full-or-part-time: 25h

Theory classes: 12h

Self study : 13h

(ENG) Projecte: desenvolupament de sistema de processat de veu i/o àudio

Full-or-part-time: 30h

Laboratory classes: 13h

Self study : 17h

ACTIVITIES

(ENG) Exercicis

(ENG) Proves de resposta llarga (Control)

(ENG) Pràctica de laboratori

(ENG) Altres activitats

(ENG) Altres activitats



(ENG) Proves de resposta llarga (Examen Final)

GRADING SYSTEM

Partial control (CNT):

Laboratory practices (LAB):

Final exam (FNL):

Formula: $\max(0.25 * CNT + 0.5 * LAB + 0.25 * FNL, 0.50 * LAB + 0.50 * FNL)$

In this subject the generic competences will be evaluated:

- Teamwork (Intermediate Level)
- Autonomous learning (Intermediate level)

EXAMINATION RULES.

BIBLIOGRAPHY

Basic:

- Huang, X.; Acero, A.; Hon, H-W. Spoken language processing: a guide to theory, algorithm and system development. Upper Saddle River: Prentice Hall, 2001. ISBN 0130226165.