



Course guides

230624 - BIOM - Biometrics

Last modified: 08/05/2020

Unit in charge: Barcelona School of Telecommunications Engineering
Teaching unit: 739 - TSC - Department of Signal Theory and Communications.

Degree: MASTER'S DEGREE IN TELECOMMUNICATIONS ENGINEERING (Syllabus 2013). (Optional subject).
MASTER'S DEGREE IN ADVANCED TELECOMMUNICATION TECHNOLOGIES (Syllabus 2019). (Optional subject).

Academic year: 2020 **ECTS Credits:** 5.0 **Languages:** English

LECTURER

Coordinating lecturer: JAVIER HERNANDO

Others: Sayrol Clois, Elisa

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

1. Ability to apply information theory methods, adaptive modulation and channel coding, as well as advanced techniques of digital signal processing to communication and audiovisual systems.

Transversal:

2. EFFECTIVE USE OF INFORMATION RESOURCES: Managing the acquisition, structuring, analysis and display of data and information in the chosen area of specialisation and critically assessing the results obtained.

3. 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
- Individual work (distance)
- Oral presentations
- Extended answer tests

LEARNING OBJECTIVES OF THE SUBJECT

In this course principles and methods of biometric systems will be presented to the student. The course will also cover the state-of-the-art techniques in audio, image and video technologies, including Deep Learning

STUDY LOAD

Type	Hours	Percentage
Hours large group	39,0	31.20
Self study	86,0	68.80

Total learning time: 125 h



CONTENTS

1. Introduction

Description:

- Definitions, examples, applications

Full-or-part-time: 4h

Theory classes: 2h

Self study : 2h

2. System Architecture and Assessment

Description:

- System architecture: features, classifiers

- Performance criteria

Full-or-part-time: 9h

Theory classes: 3h

Self study : 6h

3. Face recognition

Description:

- Face detection

- Face recognition

Full-or-part-time: 18h

Theory classes: 6h

Self study : 12h

4. Fingerprint recognition

Description:

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Full-or-part-time: 9h

Theory classes: 3h

Self study : 6h

5. Iris recognition

Description:

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Full-or-part-time: 9h

Theory classes: 3h

Self study : 6h



6. Speaker recognition

Description:

- Identification and verification
- Diarization

Full-or-part-time: 18h

Theory classes: 6h

Self study : 12h

7. Other biometrics

Description:

- Signature
- Hand geometry
- Keystroke
- Others

Full-or-part-time: 44h 40m

Theory classes: 8h 40m

Self study : 36h

8. Multimodal biometrics

Description:

- Fusion levels
- Normalization and fusion

Full-or-part-time: 8h

Theory classes: 2h

Self study : 6h

ACTIVITIES

Partial control

Related competencies :

CE1. Ability to apply information theory methods, adaptive modulation and channel coding, as well as advanced techniques of digital signal processing to communication and audiovisual systems.

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.

Full-or-part-time: 2h

Theory classes: 2h



Oral presentation of individual work

Related competencies :

CT4. EFFECTIVE USE OF INFORMATION RESOURCES: Managing the acquisition, structuring, analysis and display of data and information in the chosen area of specialisation and critically assessing the results obtained.

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.

Full-or-part-time: 0h 20m

Theory classes: 0h 20m

Final exam

Description:

Final examination.

Related competencies :

CE1. Ability to apply information theory methods, adaptive modulation and channel coding, as well as advanced techniques of digital signal processing to communication and audiovisual systems.

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.

Full-or-part-time: 3h

Theory classes: 3h

GRADING SYSTEM

Partial exam 1: 25%

Partial exam 2: 25%

Assignment and oral presentation: 25%

Practices: 25%

If all the marks are bigger than 3.5 and the weighted average is bigger than 5, passed

Otherwise,

Final exam: 50%

Assignment and oral presentation: 25%

Practices: 25%

BIBLIOGRAPHY

Basic:

- Wayman, J. [et al.]. Biometric systems: technology, design and performance evaluation. London: Springer, 2005. ISBN 1852335963.

Complementary:

- Bolle, R.M. [et al.]. Guide to biometrics. New York: Springer, 2004. ISBN 0387400893.