

Course guide

230200 - PAM - Programming for Multimedia Applications

Last modified: 20/06/2024

Unit in charge: Barcelona School of Telecommunications Engineering
Teaching unit: 701 - DAC - Department of Computer Architecture.

Degree: BACHELOR'S DEGREE IN TELECOMMUNICATIONS TECHNOLOGIES AND SERVICES ENGINEERING (Syllabus 2015). (Optional subject).
BACHELOR'S DEGREE IN DATA SCIENCE AND ENGINEERING (Syllabus 2017). (Optional subject).

Academic year: 2024 **ECTS Credits:** 6.0 **Languages:** English

LECTURER

Coordinating lecturer: JAIME M. DELGADO MERCE

Others: Primer quadrimestre:
JAIME M. DELGADO MERCE - 11
SILVIA LLORENTE VIEJO - 11

PRIOR SKILLS

Basic knowledge of programming, telecommunication networks, and coding and compression of audiovisual content.

REQUIREMENTS

NETWORK APPLICATIONS AND SERVICES - Prerequisite

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Transversal:

1. EFFECTIVE USE OF INFORMATION RESOURCES - Level 3. Planning and using the information necessary for an academic assignment (a final thesis, for example) based on a critical appraisal of the information resources used.

TEACHING METHODOLOGY

Theory + application lessons: Development of concepts from examples and exercises.

Laboratory lessons: Development of laboratory work from a case to be solved with programming resources. Integration of the different assignments.

LEARNING OBJECTIVES OF THE SUBJECT

Provide the necessary tools to develop software applications to distribute, manage and protect audiovisual content, and multimedia content in general, especially on web sites and Internet, using public specifications and products of highly generalized use.

STUDY LOAD

| Type | Hours | Percentage |
|-------------------|-------|------------|
| Self study | 98,0 | 65.33 |
| Hours small group | 19,5 | 13.00 |
| Hours large group | 32,5 | 21.67 |

Total learning time: 150 h

CONTENTS

Applications and multimedia web services

Description:

- The application layer.
- Client/Server and Symmetric models.
- E-mail: Protocols and formats.
- HTTP: Web and other applications.
- XML (eXtensible Markup Language): Syntax, Schema, Use, Associated technologies (parsers, transformations, ...).

Full-or-part-time: 22h

Theory classes: 7h 30m

Laboratory classes: 0h 30m

Self study : 14h

Development of HTTP-based applications and services

Description:

- Web applications development techniques. JSPs, Servlets.
- Distributed applications.
- Web services: SOAP, WSDL, REST.
- Programming tools.

Full-or-part-time: 47h

Theory classes: 8h

Laboratory classes: 8h

Self study : 31h

Representation and management of audiovisual content

Description:

- The standardization process.
- The market for software for audiovisual content.
- Multimedia information architecture and life cycle.
- Representation standards: Monomedia (Characters, Audio, Images, Video), Multimedia containers, Metadata.

Full-or-part-time: 21h

Theory classes: 6h

Laboratory classes: 1h

Self study : 14h

Transmission of audiovisual content

Description:

- Audiovisual content in HTML5.
- Streaming: Real time, HTTP-based, DASH.

Full-or-part-time: 18h

Theory classes: 5h

Laboratory classes: 1h

Self study : 12h

Multimedia applications security

Description:

- Security threads and mechanisms.
- Private key (symmetric) and public key (asymmetric).
- Public key infrastructure for secure services.
- Security in application level protocols.
- Security with XML.
- Security protocols for the web: SAML, OAuth.
- Privacy in Internet applications.
- Intellectual rights for multimedia content.

Full-or-part-time: 33h

Theory classes: 9h 30m

Laboratory classes: 1h 30m

Self study : 22h

Partial exams

Description:

Two partial exams

Full-or-part-time: 9h

Theory classes: 3h

Laboratory classes: 1h

Self study : 5h

GRADING SYSTEM

60% theory (and application), 30% laboratory, 10% Assignment on information search and analysis.

Evaluation of theory and application part:

A first partial exam of topics 1 to 3 (Ep1)

A second partial exam of topics 4 to 5 (Ep2)

A final optional exam with two parts: topics 1 to 3 (Ef1) and topics 4 to 5 (Ef2)

Theory mark = $0.5 * \text{MAX}(\text{Ep1}, \text{Ef1}) + 0.5 * \text{MAX}(\text{Ep2}, \text{Ef2})$

Evaluation of laboratory part:

Weekly deliverables at the sessions: 50%

Interviews and reports of the deliverables (or exam if not passed): 50%

EXAMINATION RULES.

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BIBLIOGRAPHY

Basic:

- Delgado, Jaime. Subject slides. 2021.
- Delgado, Jaime. Transparències de classe. 2021.
- Delgado, Jaime. Col·lecció de problemes resolts. 2021.