Course guides

230200 - PAM - Programming for Multimedia Applications

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

Degree: BACHELOR’S DEGREE IN AUDIOVISUAL SYSTEMS ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR’S DEGREE IN NETWORK ENGINEERING (Syllabus 2010). (Optional subject).
BACHELOR’S DEGREE IN TELECOMMUNICATIONS SCIENCE AND TECHNOLOGY (Syllabus 2010). (Optional subject).
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: 2021  ECTS Credits: 6.0  Languages: English

LECTURER

Coordinating lecturer: JAIME M. DELGADO MERCE
Others: JAIME M. DELGADO MERCE
SILVIA LLORENTE VIEJO

PRIOR SKILLS

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

REQUIREMENTS

Second year.

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

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours small group</td>
<td>19.5</td>
<td>13.00</td>
</tr>
<tr>
<td>Hours large group</td>
<td>32.5</td>
<td>21.67</td>
</tr>
<tr>
<td>Self study</td>
<td>98.0</td>
<td>65.33</td>
</tr>
</tbody>
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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: 8h
Theory classes: 7h
Laboratory classes: 1h

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: 16h
Theory classes: 5h
Laboratory classes: 11h

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: 7h
Theory classes: 5h
Laboratory classes: 2h
Multimedia applications security

**Description:**
- Security threads and mechanisms.
- Private key (symmetric) and public key (asymmetric).
- Public key and digital signature algorithms.
- 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:** 12h
Theory classes: 8h 30m
Laboratory classes: 3h 30m

Transmission of audiovisual content

**Description:**
- Audiovisual content in HTML5.
- Streaming: Real time, HTTP-based, DASH.
- Operation and delivery of content: Content Delivery Networks (CDN).

**Full-or-part-time:** 6h
Theory classes: 4h
Laboratory classes: 2h

GRADING SYSTEM

60% theory (and application), 30% laboratory, 10% Assignment associated to the generic competence.
Evaluation of generic competence: Work on information sources 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 * MAX (Ep1, Ef1) + 0.5 * MAX (Ep2, 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.

BIBLIOGRAPHY

**Basic:**