230200 - PAM - Programming for Multimedia Applications

Coordinating unit: 230 - ETSETB - Barcelona School of Telecommunications Engineering
Teaching unit: 701 - AC - Department of Computer Architecture
Academic year: 2018
Degree: BACHELOR'S DEGREE IN AUDIOVISUAL SYSTEMS ENGINEERING (Syllabus 2009). (Teaching unit Optional)
BACHELOR'S DEGREE IN NETWORK ENGINEERING (Syllabus 2010). (Teaching unit Optional)
BACHELOR'S DEGREE IN TELECOMMUNICATIONS SCIENCE AND TECHNOLOGY (Syllabus 2010).
(Teaching unit Optional)
BACHELOR'S DEGREE IN TELECOMMUNICATIONS TECHNOLOGIES AND SERVICES ENGINEERING (Syllabus 2015). (Teaching unit Optional)
ECTS credits: 6
Teaching languages: English

Teaching staff
Coordinator: 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>Total learning time: 150h</th>
<th>Hours large group:</th>
<th>32h 30m</th>
<th>21.67%</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Hours small group:</td>
<td>19h 30m</td>
<td>13.00%</td>
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<td></td>
<td>Self study:</td>
<td>98h</td>
<td>65.33%</td>
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# Content

<table>
<thead>
<tr>
<th>Applications and multimedia web services</th>
<th>Learning time: 8h</th>
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<tbody>
<tr>
<td><strong>Description:</strong></td>
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<tr>
<td>- The application layer.</td>
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<td>- Client/Server and Symmetric models.</td>
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<td>- E-mail: Protocols and formats.</td>
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<td>- HTTP: Web and other applications.</td>
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<tr>
<td>- XML (eXtensible Markup Language): Syntax, Schema, Use, Associated technologies (parsers, transformations, ...).</td>
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<thead>
<tr>
<th>Development of HTTP-based applications and services</th>
<th>Learning time: 13h</th>
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<tr>
<td><strong>Description:</strong></td>
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<tr>
<td>- Web applications development techniques. JSPs, Servlets.</td>
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<td>- Distributed applications.</td>
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<td>- Web services: SOAP, WSDL, REST.</td>
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<td>- Programming tools.</td>
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<tr>
<th>Representation and management of audiovisual content</th>
<th>Learning time: 7h</th>
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<td><strong>Description:</strong></td>
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<tr>
<td>- The standardization process.</td>
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<td>- The market for software for audiovisual content.</td>
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<td>- Multimedia information architecture and life cycle.</td>
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<tr>
<td>- Representation standards: Monomedia (Characters, Audio, Images, Video), Multimedia containers, Metadata.</td>
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## 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.

**Learning time:** 11h 30m  
Theory classes: 10h  
Laboratory classes: 1h 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).

**Learning time:** 6h  
Theory classes: 4h  
Laboratory classes: 2h

## Mobile devices programming

**Description:**
- Mobile devices and applications.
- The Android system.
- Mobile applications programming.
- Applications development process.

**Learning time:** 6h 30m  
Theory classes: 2h 30m  
Laboratory classes: 4h
Qualification system

60% theory (and application), 36% laboratory, 4% 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 6 (Ep2)
  A final optional exam with two parts: topics 1 to 3 (Ef1) and topics 4 to 6 (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%

Regulations for carrying out activities

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Bibliography

Basic:

  Delgado, Jaime. Transparències de classe.  2015.