

## 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:	2019	
Degree:	BACHELOR'S DEGREE IN TELECOMMUNICATIONS TECHNOLOGIES AND SERVICES ENGINEERING (Syllabus 2015). (Teaching unit Optional) BACHELOR'S DEGREE IN TELECOMMUNICATIONS SCIENCE AND TECHNOLOGY (Syllabus 2010). (Teaching unit Optional) BACHELOR'S DEGREE IN NETWORK ENGINEERING (Syllabus 2010). (Teaching unit Optional) BACHELOR'S DEGREE IN AUDIOVISUAL SYSTEMS ENGINEERING (Syllabus 2009). (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.



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### Study load

Total learning time: 150h	Hours large group:	32h 30m	21.67%
	Hours small group:	19h 30m	13.00%
	Self study:	98h	65.33%

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### Content

<p>Applications and multimedia web services</p>	<p>Learning time: 8h Theory classes: 7h Laboratory classes: 1h</p>
<p>Description:</p> <ul style="list-style-type: none"> <li>- The application layer.</li> <li>- Client/Server and Symmetric models.</li> <li>- E-mail: Protocols and formats.</li> <li>- HTTP: Web and other applications.</li> <li>- XML (eXtensible Markup Language): Syntax, Schema, Use, Associated technologies (parsers, transformations, ...).</li> </ul>	
<p>Development of HTTP-based applications and services</p>	<p>Learning time: 13h Theory classes: 4h Laboratory classes: 9h</p>
<p>Description:</p> <ul style="list-style-type: none"> <li>- Web applications development techniques. JSPs, Servlets.</li> <li>- Distributed applications.</li> <li>- Web services: SOAP, WSDL, REST.</li> <li>- Programming tools.</li> </ul>	
<p>Representation and management of audiovisual content</p>	<p>Learning time: 7h Theory classes: 5h Laboratory classes: 2h</p>
<p>Description:</p> <ul style="list-style-type: none"> <li>- The standardization process.</li> <li>- The market for software for audiovisual content.</li> <li>- Multimedia information architecture and life cycle.</li> <li>- Representation standards: Monomedia (Characters, Audio, Images, Video), Multimedia containers, Metadata.</li> </ul>	

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<p>Multimedia applications security</p>	<p>Learning time: 11h 30m Theory classes: 10h Laboratory classes: 1h 30m</p>
<p>Description:</p> <ul style="list-style-type: none"> <li>- Security threads and mechanisms.</li> <li>- Private key (symmetric) and public key (asymmetric).</li> <li>- Public key and digital signature algorithms.</li> <li>- Public key infrastructure for secure services.</li> <li>- Security in application level protocols.</li> <li>- Security with XML.</li> <li>- Security protocols for the web: SAML, OAuth.</li> <li>- Privacy in Internet applications.</li> <li>- Intellectual rights for multimedia content.</li> </ul>	
<p>Transmission of audiovisual content</p>	<p>Learning time: 6h Theory classes: 4h Laboratory classes: 2h</p>
<p>Description:</p> <ul style="list-style-type: none"> <li>- Audiovisual content in HTML5.</li> <li>- Streaming: Real time, HTTP-based, DASH.</li> <li>- Operation and delivery of content: Content Delivery Networks (CDN).</li> </ul>	
<p>Mobile devices programming</p>	<p>Learning time: 6h 30m Theory classes: 2h 30m Laboratory classes: 4h</p>
<p>Description:</p> <ul style="list-style-type: none"> <li>- Mobile devices and applications.</li> <li>- The Android system.</li> <li>- Mobile applications programming.</li> <li>- Applications development process.</li> </ul>	

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

Evaluation of laboratory part:

Weekly deliverables at the sessions: 50%

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

### Regulations for carrying out activities

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### Bibliography

Basic:

Delgado, Jaime. Subject slides. 2017.

Delgado, Jaime. Transparències de classe. 2015.

Delgado, Jaime. Col·lecció de problemes resolts. 2017.