Learning objectives of the subject

1. Being able to predict the performance of protocols and interpret the content of messages that use web applications.
2. Being able to interpret the XML documents interchanged web services.
3. Being able to configure an application server and launch a web application.
4. Being able to interpret the data interchanged between distributed applications.
5. Being able to configure an application server and implement web services.
6. Being able to configure an application server and implement web applications that make use of Web services.
7. Being able to describe existing formats of information and explain its normal use.
8. Being able to describe the client/server paradigm and give examples of protocols that follow it.
9. Be able to explain what a communications library is and give examples of existing libraries.
10. Be able to explain what an application server is and give examples of existing application servers.
11. Being able to describe at a high level specific characteristics of mobile applications.
12. Being able to develop a complete distributed application.
13. Being able to enumerate the differences between the different methods of transmitting multimedia content.
14. Being able to explain the results in practice "that make Web application development using Web services".
15. Being able to find information on a particular topic, apply it in the lab and write a report describing the results.
16. Ability to adapt to situations where there is lack of information and / or changes in the initial requirements.
17. Ability to answer questions related to the work done in the course of Practices.
18. Gain awareness of how to work to get some good results.
19. Ability to list the different security mechanisms that can be applied to distributed applications.

**Study load**

<table>
<thead>
<tr>
<th>Total learning time: 150h</th>
<th>Theory classes: 30h</th>
<th>20.00%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Practical classes: 0h</td>
<td>0.00%</td>
</tr>
<tr>
<td></td>
<td>Laboratory classes: 30h</td>
<td>20.00%</td>
</tr>
<tr>
<td></td>
<td>Guided activities: 6h</td>
<td>4.00%</td>
</tr>
<tr>
<td></td>
<td>Self study: 84h</td>
<td>56.00%</td>
</tr>
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</table>
### Introduction

**Degree competences to which the content contributes:**

**Description:**

### Application and service development based on HTTP

**Degree competences to which the content contributes:**

**Description:**

### Digital content representation and exchange

**Degree competences to which the content contributes:**

**Description:**
Formats: text, documents, image, video and metadata.

### Transmission and distribution systems of multimedia content

**Degree competences to which the content contributes:**

**Description:**
Streaming / download. Distribution Servers.

### Security in distributed applications

**Degree competences to which the content contributes:**

**Description:**
Security mechanisms at application level.

### Distributed applications programming with mobile devices

**Degree competences to which the content contributes:**

**Description:**
Mobile networks features. Mobile applications programming with Android.
# Planning of activities

## Developing topic: Introduction

| Hours: 5h |
|---|---|
| Theory classes: 4h |
| Practical classes: 0h |
| Laboratory classes: 0h |
| Guided activities: 0h |
| Self study: 1h |

**Description:**
Understanding of the content in order to apply them in the lab associated with the topic.

**Specific objectives:**
8, 9

## Laboratory of the topic: HTML5 language

| Hours: 3h |
|---|---|
| Theory classes: 0h |
| Practical classes: 0h |
| Laboratory classes: 2h |
| Guided activities: 0h |
| Self study: 1h |

**Description:**
Understanding of HTML5 language new features. Use of programming tools to check and modify its behaviour.

**Specific objectives:**
1

## Developing topic: Development of applications and services based on HTTP

| Hours: 10h |
|---|---|
| Theory classes: 5h |
| Practical classes: 0h |
| Laboratory classes: 0h |
| Guided activities: 0h |
| Self study: 5h |

**Description:**
Understanding the content in order to apply them in the lab associated with the topic.

**Specific objectives:**
2, 3, 5, 6

## Laboratory of the theme: Developing Web applications

| Hours: 11h |
|---|---|
| Theory classes: 0h |
| Practical classes: 0h |
| Laboratory classes: 6h |
| Guided activities: 0h |
| Self study: 5h |
**270126 - AD - Distributed Applications**

<table>
<thead>
<tr>
<th>Description:</th>
<th>Hours: 11h</th>
</tr>
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<tbody>
<tr>
<td>Understanding the configuration and operation of an application server to develop simple web applications.</td>
<td>Theory classes: 5h</td>
</tr>
<tr>
<td>Specific objectives:</td>
<td>Practical classes: 0h</td>
</tr>
<tr>
<td></td>
<td>Laboratory classes: 0h</td>
</tr>
<tr>
<td></td>
<td>Guided activities: 0h</td>
</tr>
<tr>
<td></td>
<td>Self study: 6h</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description:</th>
<th>Specific objectives:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understanding the content in order to apply them in the lab associated with the topic.</td>
<td>3</td>
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<table>
<thead>
<tr>
<th>Developing topic: Representation and exchange of digital content</th>
<th>Lab topic: Developing Web Services</th>
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<tbody>
<tr>
<td>Description:</td>
<td>Description:</td>
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<tr>
<td>Understanding the configuration and operation of an application server to develop web services.</td>
<td>Understanding the configuration and operation of an application server to develop simple web applications.</td>
</tr>
<tr>
<td>Specific objectives:</td>
<td>Specific objectives:</td>
</tr>
<tr>
<td>2, 7</td>
<td>5</td>
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</table>

<table>
<thead>
<tr>
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<th>Hours: 15h</th>
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</thead>
<tbody>
<tr>
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<td>Practical classes: 0h</td>
</tr>
<tr>
<td>Laboratory classes: 6h</td>
<td>Laboratory classes: 0h</td>
</tr>
<tr>
<td>Guided activities: 0h</td>
<td>Guided activities: 0h</td>
</tr>
<tr>
<td>Self study: 9h</td>
<td>Self study: 5h</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Developing topic: Transmission and distribution of multimedia content systems</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Description:</td>
<td></td>
</tr>
<tr>
<td>Understanding the content in order to apply them in the lab associated with the topic.</td>
<td></td>
</tr>
<tr>
<td>Specific objectives:</td>
<td>13</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Theory classes: 5h</th>
<th>Theory classes: 0h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practical classes: 0h</td>
<td>Practical classes: 0h</td>
</tr>
<tr>
<td>Laboratory classes: 0h</td>
<td>Laboratory classes: 0h</td>
</tr>
<tr>
<td>Guided activities: 0h</td>
<td>Guided activities: 0h</td>
</tr>
<tr>
<td>Self study: 5h</td>
<td>Self study: 5h</td>
</tr>
</tbody>
</table>
Lab topic: Developing web applications that make use of Web services

Description:
Understanding the configuration and operation of an application server to develop web applications that make use of Web services.

Specific objectives:
5, 6

Hours: 12h
- Theory classes: 0h
- Practical classes: 0h
- Laboratory classes: 6h
- Guided activities: 0h
- Self study: 6h

First Theory control

Description:
Control of 2 hours long. Evaluated the content of topics 1. Introduction 2. Development of applications and services based on HTTP, 3. Representation and exchange of contents.

Specific objectives:
1, 4, 7, 8, 9, 10, 16, 18

Hours: 10h
- Guided activities: 2h
- Self study: 8h

Lab interviews (In the lab)

Description:
Explanation of work done in practice "Developing web applications that make use of Web services"

Specific objectives:
14

Hours: 2h
- Theory classes: 0h
- Practical classes: 0h
- Laboratory classes: 2h
- Guided activities: 0h
- Self study: 0h

Lab interview

Description:
Interviews to evaluate the lab sessions "Desarrollo web applications that use Web services"

Specific objectives:
14, 17

Hours: 5h
- Guided activities: 3h
- Self study: 2h
### Subject explanation: Security in distributed applications

**Description:**
Understanding of the different security mechanisms that can be used at application level, such as digital signature, encryption, symmetric and asymmetric keys, privacy or authentication

**Specific objectives:**
1, 2, 4, 19

**Hours:** 8h
- Theory classes: 4h
- Practical classes: 0h
- Laboratory classes: 0h
- Guided activities: 0h
- Self study: 4h

### Lab topic: Exploratory Practice

**Description:**
Understanding the information found on the chosen topic and write a report describing the results.

**Specific objectives:**
15, 16, 18

**Hours:** 14h
- Theory classes: 0h
- Practical classes: 0h
- Laboratory classes: 6h
- Guided activities: 0h
- Self study: 8h

### Development of the topic: Programming distributed applications with mobile devices

**Description:**
Understanding the content in order to apply them in the lab associated with the topic.

**Specific objectives:**
4, 8, 9, 11

**Hours:** 7h
- Theory classes: 4h
- Practical classes: 0h
- Laboratory classes: 0h
- Guided activities: 0h
- Self study: 3h

### Overview sessions

**Hours:** 5h
- Theory classes: 1h
- Practical classes: 0h
- Laboratory classes: 0h
- Guided activities: 0h
- Self study: 4h
### Description:
Posing questions about the matter to the teacher concerned. Preparation of control and the final exam

### Second Theory control

<table>
<thead>
<tr>
<th>Hours: 10h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guided activities: 2h</td>
</tr>
<tr>
<td>Self study: 8h</td>
</tr>
</tbody>
</table>

**Description:**
Control of 2 hours duration. Evaluated the content of topics 4. Transmission systems and distribution of multimedia content, 5. Security in distributed applications, 6. Programming of distributed applications with mobile devices

**Specific objectives:**
1, 2, 3, 4, 5, 6, 8, 10, 12, 13, 19

### Final exam for the course

<table>
<thead>
<tr>
<th>Hours: 12h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guided activities: 3h</td>
</tr>
<tr>
<td>Self study: 9h</td>
</tr>
</tbody>
</table>

**Specific objectives:**
1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 17, 19
The evaluation of the course will have two parts: Theory (60%) and laboratory (40%).

The laboratory grade will be calculated from the mark achieved in practices and laboratory interviews.

The theory grade will be calculated from controls grade and/or the final exam.

The formula for calculating the grade for the course will be:

\[ NF = (0.6 \times EF \text{ or } 0.3 \times C1 + 0.3 \times C2) + 0.4 \times NL \]

Where:
- NF = Note the end of the course.
- Final Exam = EF theory.
- Note C1 = First Theory Control.
- Note C2 = Second Theory Control.
- NL = Laboratory. Will be calculated based on the average of the practices delivery (50%) and the practices reports and interviews (50%).

Competence evaluation:

Technical competences are evaluated in the laboratory and their value corresponds to the 40% of the total mark of the subject. Moreover, the generic competence marks will be extracted from some laboratory activities, as described next.

The generic competence Empreneduría i Innovació will be evaluated in the exploratory practice.
The generic competence Actitud Adequada Davant el Treball will be evaluated at the practice interviews.

Generic competences evaluation: They can have values A, B, C or D (where A corresponds to an excellent standard, B corresponds to a desired level, C corresponds to a sufficient level and D corresponds to a level not achieved).
270126 - AD - Distributed Applications

Bibliography

Basic:


Complementary:


Others resources:

Hyperlink

http://www.w3.org/standards/webofservices

http://axis.apache.org/axis2/java/core/

http://staffweb.cms.gre.ac.uk/~k.mcmanus/web/