310623 - Geoservices: Design and Implementation

Coordinating unit: 310 - EPSEB - Barcelona School of Building Construction
Teaching unit: 751 - DECA - Department of Civil and Environmental Engineering
Academic year: 2019
Degree: BACHELOR’S DEGREE IN GEOINFORMATION AND GEOMATICS ENGINEERING (Syllabus 2016).
ECTS credits: 6
Teaching languages: Catalan, Spanish

Teaching staff
Coordinator: Mercedes Sanz Conde
Others: Juan Carlos González González
Mercedes Sanz Conde

Opening hours
Timetable: Available on the website of the school

Prior skills
Complete learning of a GIS.

Degree competences to which the subject contributes

Basic:
CB2EGG. The students must know how to apply their knowledge to the work or vocation in a professional way and possess the competences that are used to be demonstrated by the elaboration and defense of arguments and the resolution of problems inside their own field of study.
CB3EGG. The students must have the capacity to gather and interpret relevant data (normally inside the field of study) to emit judgements that include a reflexion into relevant social, scientific or ethic contents.

Specific:
CE17EGG. Knowledge, use and application of instruments and photogrammetric and topographic methods appropriate to the realization of non cartographic raisings.

Generical:
CG1EGG. Design and develop geomatic and topographic projects.
CG4EGG. Capacity to take decisions, leadership, management of human resources and direction of interdisciplinary teams related with the special information.
CG5EGG. Determine, measure, evaluate and represent the ground, tridimensional objects, points and trajectories.
CG6EGG. Reunite and interpret information of the ground and all of this geographic and economically related with the ground.
CG7EGG. Management and execution of investigation projects, development and innovation inside the scope of this engineering.
CG8EGG. Planification, project, direction, execution and management of measurements processes, information systems, image exploitation, positioning and navigation; modeling, representation and visualization of the territorial information in, under and above the ground surface.
CG10EGG. Planification, project, direction, execution and management of processes and products of application in the environment, agronomy, forest and miner engineering inside the geomatic field.
Transversal:
CT3. TEAMWORK: Being able to work in an interdisciplinary team, whether as a member or as a leader, with the aim of contributing to projects pragmatically and responsibly and making commitments in view of the resources that are available.
CT4. EFFECTIVE USE OF INFORMATION RESOURCES: Managing the acquisition, structuring, analysis and display of data and information in the chosen area of specialisation and critically assessing the results obtained.
CT5. FOREIGN LANGUAGE: Achieving a level of spoken and written proficiency in a foreign language, preferably English, that meets the needs of the profession and the labour market.

Teaching methodology
Master classes.
Laboratory practice.
Autonomous work.
Teamwork.

Learning objectives of the subject
Development of mapping for Web.
Learning Python.
Flow of geoprocesses.

Study load

<table>
<thead>
<tr>
<th>Total learning time: 150h</th>
<th>Hours large group:</th>
<th>24h</th>
<th>16.00%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hours medium group:</td>
<td>36h</td>
<td>24.00%</td>
</tr>
<tr>
<td></td>
<td>Self study:</td>
<td>90h</td>
<td>60.00%</td>
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</tbody>
</table>
# 310623 - Geoservices: Design and Implementation

## Content

<table>
<thead>
<tr>
<th>1: Introduction to for Web GIS</th>
<th>Learning time: 16h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Practical classes: 6h</td>
</tr>
<tr>
<td></td>
<td>Self study: 10h</td>
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</tbody>
</table>

**Description:**
Introduction to , oriented to the programming of applications type Web GIS, with the library Openlayers.

**Related activities:**
Activity 3

**Specific objectives:**
Basic learning of Java

<table>
<thead>
<tr>
<th>2. Introduction to Python.</th>
<th>Learning time: 19h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Practical classes: 9h</td>
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<tr>
<td></td>
<td>Self study: 10h</td>
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</tbody>
</table>

**Description:**
Python and ArcGIS.

**Related activities:**
Activity 4

**Specific objectives:**
The Python scripting language an how it relates to ArcGIS.

<table>
<thead>
<tr>
<th>3. Design and implementation of visualization geoservices.</th>
<th>Learning time: 16h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Practical classes: 6h</td>
</tr>
<tr>
<td></td>
<td>Self study: 10h</td>
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</tbody>
</table>

**Description:**
The publication of contents geographical, oriented to the broadcasting, through Services Web of display, require of a work specific of design of model of data and of its representation cartographic, as well as of them different schemes of tessellation existing.

**Related activities:**
Activity 5

**Specific objectives:**
Development of cartography for his publication on the Web.
### Planning of activities

| Activity 1: Modelbuilder | Hours: 18h  
Theory classes: 6h  
Self study: 12h |
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td><strong>Description:</strong></td>
<td>Learning Modelbuilder</td>
</tr>
<tr>
<td><strong>Support materials:</strong></td>
<td>ArcGIS</td>
</tr>
</tbody>
</table>

| Activity 2: ArcGIS PRO | Hours: 18h  
Practical classes: 6h  
Theory classes: 12h |
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</thead>
<tbody>
<tr>
<td><strong>Description:</strong></td>
<td>Learning ArcGIS PRO</td>
</tr>
</tbody>
</table>

| Activity 3: Introduction to Java | Hours: 13h  
Practical classes: 3h  
Self study: 10h |
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<tr>
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</thead>
<tbody>
<tr>
<td><strong>Description:</strong></td>
<td>Java for Web GIS</td>
</tr>
</tbody>
</table>

| Activity 4: Introduction to Python | Hours: 16h  
Theory classes: 6h  
Self study: 10h |
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td><strong>Description:</strong></td>
<td>Learning Python applied to GIS.</td>
</tr>
<tr>
<td><strong>Support materials:</strong></td>
<td>Python and ArcGIS</td>
</tr>
</tbody>
</table>

| Activity 5: Digital maps for visualization geoservices. | Hours: 56h  
Practical classes: 6h  
Laboratory classes: 15h  
Practical classes: 15h  
Self study: 20h |
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<tr>
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<tbody>
<tr>
<td><strong>Description:</strong></td>
<td>The student will work with ArcGIS Desktop and will make the necessary changes in cartography to proceed with the publication of services resulting from the viewing with and without tiles within the ArcGIS environment for Server.</td>
</tr>
</tbody>
</table>
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Support materials:
ArcGIS Desktop y ArcGIS Server.

Descriptions of the assignments due and their relation to the assessment:
Delivery of practice.

Specific objectives:
Comparison of cartography used in: OpenStreetMap, Google Maps or BingMaps.

Qualification system

<table>
<thead>
<tr>
<th>Week</th>
<th>Activity</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 8</td>
<td>practical exam</td>
<td>15%</td>
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<tr>
<td>Week 15</td>
<td>practical exam</td>
<td>15%</td>
</tr>
<tr>
<td>Week 9</td>
<td>practical exam</td>
<td>30%</td>
</tr>
<tr>
<td>Week 14</td>
<td>practical exam</td>
<td>30%</td>
</tr>
<tr>
<td>Finals exams</td>
<td>delivery</td>
<td>10%</td>
</tr>
</tbody>
</table>

Regulations for carrying out activities

All evaluation tests are mandatory.

Bibliography

Basic:

Others resources:

Audiovisual material
ArcGIS PRO
Resource

Computer material
ArcGIS for Server
Software

ArcGIS for Desktop
Software