310638 - Remote Sensing Project

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). (Teaching unit Optional)
ECTS credits: 4,5
Teaching languages: Catalan, Spanish

Teaching staff

Coordinator: CAROLINA PUIG POLO

Opening hours

Timetable: Hours agreed

Requirements

Have studied or passed the subject of Remote Sensing

Degree competences to which the subject contributes

Specific:
1. Knowledge, application and analysis of the processes of treatment of digital images and special information, proceeding from airborne and satellite sensors.
2. Design and develope geomatic and topographic projects.

3. (ENG) Planificació, projecte, direcció, execució i gestió de processos de mesura, sistemes d’informació, explotació d’imatges, posicionament i navegació; modelització, representació i visualització de la informació territorial en, sota i sobre la superfície terrestre.
4. (ENG) Planificació, projecte, direcció, execució i gestió de processos i productes d’aplicació a la societat de l’informació dins l’àmbit geomàtic.

Generical:
8. Use of teams and instrumental: Capacity to select the necessary ressources to the achievement of the planned goals according to the quality requirements. Use of the teams, in adequated conditions, with professional efficiency and taking into account the limitations of the instruments and its context of use, in relation with the required precisions.

Transversal:
5. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 3. Communicating clearly and efficiently in oral and written presentations. Adapting to audiences and communication aims by using suitable strategies and means.
6. SUSTAINABILITY AND SOCIAL COMMITMENT - Level 3. Taking social, economic and environmental factors into account in the application of solutions. Undertaking projects that tie in with human development and sustainability.
7. EFFECTIVE USE OF INFORMATION RESOURCES - Level 1. Identifying information needs. Using collections, premises and services that are available for designing and executing simple searches that are suited to the topic.

Teaching methodology

The subject is mainly practical, at the beginning of each content will be done a brief theoretical explanation and afterwards will be applied the learnt concepts.
The attendance is considered indispensable for the correct assimilation of the subject, because the project is made in a collaborative way.
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Learning objectives of the subject

The basic goal of this subject is consolidate the knowledge learnt in the subject of Remote Sensing and study real applications through practical classes.

Study load

<table>
<thead>
<tr>
<th>Total learning time: 112h 30m</th>
<th>Hours large group: 18h 16.00%</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Hours medium group: 27h 24.00%</td>
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<tr>
<td></td>
<td>Hours small group: 0h 0.00%</td>
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<td></td>
<td>Guided activities: 0h 0.00%</td>
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<tr>
<td></td>
<td>Self study: 67h 30m 60.00%</td>
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</tbody>
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# Content

| - Introduction to sensors and the tipology of satellite images used during the course. Introduction to the software used. | **Learning time:** 7h  
Theory classes: 3h  
Practical classes: 1h  
Laboratory classes: 1h  
Self study: 2h |
| --- | --- |

**Description:**  
Brief introduction to the sensors and images used during the course. Introduction to software: LeoWorks, Neast, Miramon,...

**Related activities:**  
Activity 1. Visualization and interpretation of optic images and radar images

**Specific objectives:**  
Know the characteristics of the sensors and images.  
Learn the basic functioning of software about satellite image treatment.

| - Preprocessing of satellite images: geometric corrections and radiometric | **Learning time:** 16h  
Theory classes: 3h  
Practical classes: 4h  
Laboratory classes: 1h  
Self study: 8h |
| --- | --- |

**Description:**  
Reviewed of the geometric correction and radiometric of optic images and radar images

| - Meteorological satellites. Applications. | **Learning time:** 25h 30m  
Theory classes: 4h  
Practical classes: 3h  
Laboratory classes: 1h  
Self study: 17h 30m |
| --- | --- |

**Description:**  
Brief introduction to the different types of meteorological satellites and the spectral band of their sensors. Characteristics from the METEOSAT and NOAA images. Estimation of the precipitation across remote sensing images.
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- Applications of the remote sensing for vegetation, ground and ice studies.

**Learning time:** 31h
- Theory classes: 4h
- Practical classes: 4h
- Laboratory classes: 3h
- Self study: 20h

**Description:**
Description of the analysis tools that allow us to classify different grounds, delimit surfaces with gels and determinate zones with vegetal cover.

- Multitemporal analysis of images. Detection of changes. Use changes and covers of ground.

**Learning time:** 33h
- Theory classes: 4h
- Practical classes: 6h
- Laboratory classes: 3h
- Self study: 20h

**Description:**
Study of how with multitemporal images, optics and by radar, allow us to analyze the evolution of terrestrial covers.

**Qualification system**
The qualification of the subject is break down in:
- 30% delivery of activities
- 70% delivery and presentation of the synthesis project

**Regulations for carrying out activities**
To pass the subject, the student must have delivered all the activities programmed and attended to the practical classes.

**Bibliography**

**Basic:**