Course guide
310768 - 310768 - Geomatic Techniques for Building

Unit in charge: Barcelona School of Building Construction
Teaching unit: 751 - DECA - Department of Civil and Environmental Engineering.
Degree: BACHELOR’S DEGREE IN ARCHITECTURAL TECHNOLOGY AND BUILDING CONSTRUCTION (Syllabus 2019).
Academic year: 2022  ECTS Credits: 3.0  Languages: Catalan, Spanish

LECTURER

Coordinating lecturer: Buill Pozuelo, Felipe
Others: ------

TEACHING METHODOLOGY

The course is organized into two hours of class a week in large group. The classes are devoted to theory sessions (3 topics) (15 h). In the rest of the face-to-face classes, practices and various workshops are held (10 h). There are also participatory classes consisting of theory tests and exams (5 h).

In the theoretical classes learning objectives related to general concepts related to geomatics building techniques are introduced. Subsequently, and through practical exercises, we try to motivate and involve the student to actively participate in their learning.

Support material is used through ATENEA: learning objectives by content, concepts, examples, programming of evaluation and directed learning activities and bibliography.

The specific learning objectives of each of the contents of the subject are worked on, through the resolution of exercises or problems. These problem sessions are intended to incorporate some generic skills.

We must also consider other hours of autonomous learning, such as those dedicated to guided reading and the resolution of the problems proposed on the different contents, through the ATENEA virtual campus.

LEARNING OBJECTIVES OF THE SUBJECT

At the end of the course, the student must be able to:
- Know the tools and existing geomatic resources for their application in building.
- Know and use appropriate geomatic and photogrammetric instruments and methods for conducting building surveys.

STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Hours large group</td>
<td>30,0</td>
<td>40.00</td>
</tr>
<tr>
<td>Self study</td>
<td>45,0</td>
<td>60.00</td>
</tr>
</tbody>
</table>

Total learning time: 75 h
CONTENTS

**Global Navigation Satellite Systems**

**Description:**
- General structure of a GNSS system
- Types of observables
- Positioning methods
- Data processing
- GNSS system applications

**Specific objectives:**
Introduce the student to the GNSS technique.
Show the different positioning and navigation possibilities.
GNSS system applications.

**Related activities:**
Practice with GNSS technique

**Full-or-part-time:** 25h
Theory classes: 5h
Guided activities: 5h
Self study: 15h

**Precision geometric controls**

**Description:**
- Precision leveling
- Automated instrumentation. Auscultation
- Laser Scanning

**Specific objectives:**
Introduce the student to auscultation techniques
Show the different geometric control techniques
Applications of the laser scanner system

**Related activities:**
Practice surveying

**Full-or-part-time:** 25h
Theory classes: 5h
Guided activities: 5h
Self study: 15h
Photogrammetry applied to buildings

Description:
- Basics
- Instrumentation
- 2D (rectification) and 3D (restitution) methods
- Obtaining 3D models of architectural objects. Plans, elevations, sections
- Application of UAV systems (Unmanned Aerial Vehicle)

Specific objectives:
Introduce the student to the photogrammetric technique
Show the different photogrammetric methods
Applications of architectural photogrammetry

Related activities:
Practice with photogrammetric technique

Full-or-part-time: 25h
- Theory classes: 5h
- Guided activities: 5h
- Self study: 15h

ACTIVITIES

1. Practice with GNSS technique

Description:
Making a practice of GNSS data collection and processing. Assessment of the results obtained

Specific objectives:
Practical application of GNSS data collection

Full-or-part-time: 5h
- Guided activities: 5h

2. Practice with topographic technique

Description:
Making a practice with topographic data collection and processing instruments 3D information

Specific objectives:
Practical application of data collection with digital surveying instruments

Full-or-part-time: 5h
- Guided activities: 5h

3. Practice with photogrammetric technique

Description:
Making a practice of taking data photographic and information processing for 2D and 3D photogrammetric information

Specific objectives:
Practical photogrammetric shooting application with a standard digital camera and coverage processing

Full-or-part-time: 5h
- Guided activities: 5h
**GRADING SYSTEM**

The final grade is the sum of the following partial grades:
- Classroom activities: 50%
- Final work: 30%
- Defense of the final work: 20%

Final work: Search for application examples on a topic related to geomatics applied to the field of building / architecture. There will be an oral presentation of the developed topic.

**BIBLIOGRAPHY**

**Basic:**

**Complementary:**

**RESOURCES**

**Hyperlink:**