Course guide

310640 - 310640 - Terrestrial and Uav Photogrammetry

Unit in charge: Barcelona School of Building Construction
Teaching unit: 751 - DECA - Department of Civil and Environmental Engineering.
Degree: BACHELOR’S DEGREE IN GEOINFORMATION AND GEOMATICS ENGINEERING (Syllabus 2016). (Optional subject).
Academic year: 2023  ECTS Credits: 4.5  Languages: Spanish

LECTURER

Coordinating lecturer: FELIPE BUILL POZUELO
Others: FELIPE BUILL POZUELO

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

General:
5. Use of teams and instrumental: Capacity to select the necessary resources to achieve the planned goals according to the requirements. Use of the teams, in adequate 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:
1. SELF-DIRECTED LEARNING - Level 3. Applying the knowledge gained in completing a task according to its relevance and importance. Deciding how to carry out a task, the amount of time to be devoted to it and the most suitable information sources.
2. TEAMWORK - Level 1. Working in a team and making positive contributions once the aims and group and individual responsibilities have been defined. Reaching joint decisions on the strategy to be followed.
3. TEAMWORK - Level 2. Contributing to the consolidation of a team by planning targets and working efficiently to favor communication, task assignment and cohesion.
4. 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.

TEACHING METHODOLOGY

The directed learning hours consist of giving theoretical classes (large group), in which the teacher makes a brief presentation to introduce the general learning objectives related to the basic concepts of the subject. Subsequently and through practical exercises, it tries 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 activities and directed learning and bibliography. They also consist of giving classes of problems and a laboratory in which they work, by solving exercises, problems and practices, related to the specific learning objectives of each of the contents of the subject.

In these problem / practical sessions it is intended to incorporate some generic competences.

After each session, tasks outside the classroom are proposed, which must be worked on individually and in groups.

Other hours of autonomous learning must also be considered, such as those devoted to directed reading and solving the problems proposed on the different contents, through the virtual campus ATENEA.
LEARNING OBJECTIVES OF THE SUBJECT

At the end of the course, the student must be able to:
- Know, use and apply the techniques of treatment and analysis of spatial data
- Know, use and apply instruments and topographic and photogrammetric methods suitable for carrying out non-cartographic surveys
- Knowledge and application of least squares adjustment methods in the field of topo-geodetic, photogrammetric and cartographic observations

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>18,0</td>
<td>16.00</td>
</tr>
<tr>
<td>Self study</td>
<td>67,5</td>
<td>60.00</td>
</tr>
<tr>
<td>Hours medium group</td>
<td>27,0</td>
<td>24.00</td>
</tr>
</tbody>
</table>

Total learning time: 112.5 h

CONTENTS

**INTRODUCTION. NON-CARTOGRAPHIC PHOTOGRAMMETRY**

Description:
Introduction to the terrestrial photogrammetric case. Application in architectural and archaeological surveys. Special cases

Full-or-part-time: 14h
Theory classes: 2h
Self study: 12h

**GEOMETRIC FOUNDATIONS**

Description:
Geometric foundations of photography. Main characteristics of terrestrial or non-topographic photogrammetry. Photographic coverages

Full-or-part-time: 15h
Theory classes: 5h
Self study: 10h

**INSTRUMENTS**

Description:
Instrumentation used in the different terrestrial photogrammetric methods

Full-or-part-time: 5h
Theory classes: 2h
Self study: 3h
## PHOTOGRAMMETRY WITH UAV

**Description:** Application of UAV (Unmanned Aerial Vehicle) systems for capturing photographs for photogrammetric purposes. Application in archaeological surveys, civil engineering, geology ...

**Full-or-part-time:** 8h  
Theory classes: 2h  
Practical classes: 4h  
Self study: 2h

## DERIVATIVE PRODUCTS

**Description:** Obtaining 3D models of architectural, archaeological objects ... Plans, elevations, sections ...

**Full-or-part-time:** 6h  
Theory classes: 3h  
Self study: 3h

## CASE STUDY. PHOTOGRAMETRIC SURVEY

**Description:** Project and execution of a large-scale, small-area photogrammetric survey

**Related activities:**  
[ENG] Actividad 1  

**Full-or-part-time:** 41h  
Practical classes: 15h  
Laboratory classes: 9h  
Self study: 17h

## GRADING SYSTEM

The final qualification is the addition of the following partial qualification:

- Class activities: 30%  
- Memory of the final project: 50%  
- Defense of the final project: 20%

Final project: Doing a photogrammetric project related with the arquitectonic and/or archeologic surveying (associated concepts to the goals of learning of the subject). It will be delivered a memory of all the projects and drawings of detail. It will be carried out an oral exposition of the developed topic.

## EXAMINATION RULES

It is mandatory to do all the practices in order to have an average mark
**BIBLIOGRAPHY**

**Basic:**

**Complementary:**