Course guide
310619 - 310619 - Global Satellite Positioning Systems

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).
(Compulsory subject).
Academic year: 2022 ECTS Credits: 6.0 Languages: Spanish

LECTURER

Coordinating lecturer: Nuñez Andres, Maria Amparo
Others: Nuñez Andres, Maria Amparo

PRIOR SKILLS

Knowledge of geometric geodesy, geophysics, adjustment of observations and topographic methods.

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
1. (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.
2. (ENG) Reunir i interpretar informació del terreny i tota aquella relacionada geogràficament i econòmicament amb ell.
3. Knowledge and application of the methods and techniques of the physics ans spacial geodesy; geomagnetism; sismology and seismic engineering; gravimetry.

Transversal:
4. EFFECTIVE USE OF INFORMATION RESOURCES - Level 2. Designing and executing a good strategy for advanced searches using specialized information resources, once the various parts of an academic document have been identified and bibliographical references provided. Choosing suitable information based on its relevance and quality.

TEACHING METHODOLOGY

Theoretical classes
Practical classes
Exams
Field practices

LEARNING OBJECTIVES OF THE SUBJECT

At the end of the study of this subject, the student should be able to:
- Apply the methods and techniques of spatial geodesy.
STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self study</td>
<td>90,0</td>
<td>60.00</td>
</tr>
<tr>
<td>Hours large group</td>
<td>24,0</td>
<td>16.00</td>
</tr>
<tr>
<td>Hours medium group</td>
<td>36,0</td>
<td>24.00</td>
</tr>
</tbody>
</table>

Total learning time: 150 h

CONTENTS

(ENG) Estructura general de un sistema GNSS

Description:
Reference systems
System architecture

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

(ENG) Observaciones GPS

Description:
Observables
Errors
DGPS

Related activities:
Activity 1

Full-or-part-time: 10h
Theory classes: 3h
Practical classes: 2h
Self study: 5h

Phase observations

Description:
Phase differential
Observation equations
Resolution of ambiguities
Accuracy of results
Combination of observables

Related activities:
Activity 2

Full-or-part-time: 19h
Theory classes: 4h
Practical classes: 5h
Self study: 10h
Instruments and methods

Description:
- Geodetic receivers
- Geodesic antennas
- Observation methods
  - Static
  - Kinematic
  - Post-Process
  - RTK

Related activities:
- Activity 3

Full-or-part-time: 19h
- Theory classes: 4h
- Practical classes: 5h
- Self study: 10h

GPS data processing

Description:
- Data preparation
- Vector calculation
- Analysis of results
- Network setting

Full-or-part-time: 17h
- Theory classes: 4h
- Practical classes: 6h
- Self study: 7h

GPS system applications

Description:
- Applications
- Navigation
- Sensor integration
- Geodesy and surveying with GPS

Full-or-part-time: 4h
- Theory classes: 2h
- Practical classes: 2h

ACTIVITIES

(ENG) EXAMEN 1

Full-or-part-time: 12h
- Theory classes: 2h
- Self study: 10h
| (ENG) EXAMEN 2 | Full-or-part-time: 12h  
Theory classes: 2h  
Self study: 10h |
|---------------|------------------|
| (ENG) PRÁCTICA 1 | Full-or-part-time: 8h  
Practical classes: 1h  
Self study: 7h |
| (ENG) PRÁCTICA 2 | Description:  
Phase GPS data collection with static method  
vector calculation  
network setting  

Material:  
Phase GPS Receivers  
practice script  
calculation software  

Delivery:  
Practice memory  
Full-or-part-time: 15h  
Practical classes: 6h  
Self study: 9h |
| (ENG) PRÁCTICA 3 | Description:  
Phase GPS data collection with kinematic method  

Material:  
Phase GPS Receivers  
Practice script  
Calculation software  

Delivery:  
Practice memory  
Full-or-part-time: 16h  
Practical classes: 9h  
Self study: 7h |
| (ENG) PRACTICA 4 | Full-or-part-time: 6h  
Practical classes: 2h  
Self study: 4h |
**GRADING SYSTEM**

Continuous assessment exams 70%
Practice Report 30%

**EXAMINATION RULES.**

Only those students who, having taken all the exams, have a grade higher than 3.5, may attend the re-evaluation.

**BIBLIOGRAPHY**

**Basic:**