

## Course guide

### 310602 - 310602 - Computer-Assisted Design

**Last modified:** 07/11/2023

**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:** 2023    **ECTS Credits:** 6.0    **Languages:** Spanish

#### LECTURER

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**Coordinating lecturer:** Rogelio López Bravo

**Others:** Rogelio López Bravo  
Francisco Javier Muñoz Capilla

#### DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

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**Specific:**

CE4EGG. Capacity of spatial vision and knowledge of the graphic representation techniques, for the traditional methods of metric geometry and descriptive geometry, an in addition for the applications of assisted design by computer.

**Generical:**

CG6EGG. Reunite and interpret information of the ground and all of this geographic and economically related with the ground.  
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.

**Transversal:**

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.

06 URI. EFFECTIVE USE OF INFORMATION RESOURCES. Managing the acquisition, structure, analysis and display of information from the own field of specialization. Taking a critical stance with regard to the results obtained.

**Basic:**

CB1EGG. The students have demonstrated possess and comprehend knowledge in a field of study that comes from high school, and is used to a level that, while is supported in advanced textbooks, it also includes some aspects that involve knowledge from the field of study in the vanguard.

#### TEACHING METHODOLOGY

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Lectures, sessions with guided exercises, both in theoretical and practical classes in the computer classroom.

#### LEARNING OBJECTIVES OF THE SUBJECT

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Know the main representation systems in Geomatics.  
Learn how to use the two main computer-assisted drawing programs: Autocad and Microstation.

## STUDY LOAD

Type	Hours	Percentage
Hours medium group	36,0	24.00
Self study	90,0	60.00
Hours large group	24,0	16.00

**Total learning time:** 150 h

## CONTENTS

### REPRESENTATION SYSTEMS

#### Description:

1. Introduction to the representation systems
2. Metric and descriptive geometry
3. Normalization
4. Sketching

#### Specific objectives:

Knowledge of the main representation systems used  
 Introduction to the metric and descriptive geometry: basic elements, figures, parallelism, proportions  
 Concept of scale  
 Knowledge of the standards that the representation systems must follow  
 Carrying out maps by hand

#### Related activities:

Exercises of metric geometry  
 Scale exercises  
 Practice outside the class of sketching

#### Full-or-part-time: 30h

Theory classes: 5h  
 Laboratory classes: 3h  
 Guided activities: 4h  
 Self study : 18h

## DIEDRIC SYSTEM

### Description:

1. Rectas y planos
2. Paralelismo y perpendicularidad
3. Intersecciones
4. Abatimientos
5. Distancias, giros
6. Cambios de plano

### Specific objectives:

Fundamentos del sistema diédrico.

Representación de objetos en 2 dimensiones y 3 dimensiones.

### Related activities:

Ejercicios de sistema diédrico en el aula de informática. Resolución de los mismo

### Full-or-part-time: 23h

Theory classes: 3h

Laboratory classes: 2h 30m

Guided activities: 2h 30m

Self study : 15h

## DIMENSIONED PLANE SYSTEM

### Description:

1. Introduction
2. Dimensioned plane system
3. Applications of the dimensioned plane system (I): Roofs and rafts
4. Applications of the dimensioned plane system (II): Representation of relief
5. Applications of the dimensioned plane system (III): Longitudinal and transversal profiles
6. Aplicaciones del sistema de planos acotados (IV): Dams
7. Aplicaciones del sistema de planos acotados (V): Grading
8. Aplicaciones del Sistema de Planos Acotados (VI): roads and forest tracks

### Specific objectives:

Knowing the dimensioned plane system and his practic applications in the environment of the Geomatic

Determination of slopes, interpolation, slopes.

### Related activities:

Exercises of dimensioned planes in the informatic class

Interpolation of level curves

Calculation of surfaces and volumes

### Full-or-part-time: 26h 40m

Theory classes: 5h

Laboratory classes: 5h

Self study : 16h 40m

### CAD APPLIED TO GEOMATICS

**Description:**

1. Foundations of the software of design assisted by computer. Basic entities.
2. Handling of basic tools: line, point, polyline
3. Drawing editing tools (I): Selection. Symmetry. Escapes. Copy. Cut. Enlarge. Turn.
4. Drawing editing tools (II): Matrix. Equidistant elements. Connection. Chamfer. Graduate. Divide
5. Cape order. Shading. Dimensioning. Scales
6. Editing Impression and exchange of Information

**Specific objectives:**

Learning the main tools of the software most used: Autocad and Microstation  
Realization of the topographic drawing according to specified characteristics

**Related activities:**

Practices in the computing room

**Full-or-part-time:** 55h 20m

Theory classes: 2h

Laboratory classes: 20h

Self study : 33h 20m

## ACTIVITIES

### EXERCISES OF DIEDRIC SYSTEM

**Description:**

Intersection of straight lines and planes  
Parallelism and perpendicularity exercises  
Intersection exercises

**Material:**

The activities will be developed in the computing room

**Full-or-part-time:** 12h

Laboratory classes: 4h

Self study: 8h

### EXERCISES OF DIMENSIONED PLANE SYSTEM

**Description:**

Interpolation of level curves  
Platforms, covers  
Slopes, longitudinal and transversal profiles  
Surfaces, volumes

**Full-or-part-time:** 20h

Laboratory classes: 5h

Self study: 15h



## CAD INTRODUCTION

### Description:

Tools of drawing and edition.

Layers

Modification and changes

Topographic drawing

**Full-or-part-time:** 19h

Laboratory classes: 7h

Self study: 12h

## GRADING SYSTEM

The student must take all the tests. The final mark of the subject is made up of the sum of the different practices that will be carried out in class. There will be two practices of integral development in the classroom that will have a higher value than the rest, not being in any case greater than 20% each. Completion of all practices is compulsory. There is no re-evaluation exam due to the high percentage of the mark linked to the practices. The non-delivery of all the practices supposes a qualification of NP.

## EXAMINATION RULES.

The delivery of the practices will be done through Atenea. Continuous evaluation

## BIBLIOGRAPHY

### Basic:

- Hernández Blanco, Julio. Expresión gráfica y cartográfica para títulos de grado en coordenadas ECTS. Cáceres: Universidad de Extremadura, Servicio de Publicaciones, 2008. ISBN 9788477238010.
- Izquierdo Asensi, Fernando. Geometría descriptiva. 23ª ed. Madrid: Paraninfo, 1997. ISBN 8492210915.

### Complementary:

- Álvaro González, José Ignacio. Ejercicios del sistema de planos acotados y su aplicación al dibujo topográfico. Madrid: Dossat 2000, 1994. ISBN 9788423708277.
- Reyes Rodríguez, Antonio Manuel. AutoCAD 2016. Madrid: Anaya Multimedia, 2015. ISBN 9788441537231.