Course guide
310181 - 310181 - Graphic Survey of Existing Buildings

Last modified: 09/05/2025

Unit in charge: Barcelona School of Building Construction
Teaching unit: 751 - DECA - Department of Civil and Environmental Engineering.
752 - RA - Departamento de Representación Arquitectónica.

Degree: MASTER'S DEGREE IN DIAGNOSIS AND INTERVENTION TECHNIQUES IN BUILDING CONSTRUCTION (Syllabus 2020). (Compulsory subject).

Academic year: 2025 **ECTS Credits:** 5.0 **Languages:** Spanish

LECTURER

Coordinating lecturer: Felipe Buill Pozuelo

Others: Jesus Esquinas Dessy

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
CE4MUDITIE. To apply the advanced techniques of graphic elevations of buildings on the recognition of existing buildings.

Transversal:
CT3MUDITIE. (ENG) Treball en equip. Ser capaç de treballar com a membre d'un equip interdisciplinar, ja sigui com un membre més o realitzant tasques de direcció, amb la finalitat de contribuir a desenvolupar projectes amb pragmatisme i sentit de la responsabilitat, assumint compromisos, tenint en compte els recursos disponibles.
CT4MUDITIE. (ENG) Ús solvent dels recursos de la informació. Gestionar l'adquisició, l'estructuració, l'anàlisi i la visualització de dades i informació en l'àmbit de la seva especialitat i valorar de forma crítica els resultats d'aquesta gestió.

Basic:
CB7MUDITIE. For the students to know how to apply the knowledge acquired and their problem-solving capacity in new environments or slightly familiar, within wider contexts (or multidisciplinary) related to their area of study.

TEACHING METHODOLOGY

In the theoretical classes, the general learning objectives related to the basic concepts of the subject 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, by solving exercises or problems. In these problem sessions it is intended to incorporate some generic competences.

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

Other hours of autonomous learning must also be considered, such as those devoted to oriented 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 and use existing tools and resources for the graphic documentation of a building.
- Know and use the instruments and topographic and photogrammetric methods suitable for carrying out architectural surveys.
- Know, use and apply advanced techniques of graphic building surveys in the recognition of existing buildings (digital terrestrial photogrammetry, laser scanner ...).

STUDY LOAD

Type	Hours	Percentage
Guided activities	10,0	8.00
Hours large group	15,0	12.00
Hours small group	5,0	4.00
Self study	90,0	72.00
Hours medium group	5,0	4.00

Total learning time: 125 h

CONTENTS

1. Introduction. Concepts and fundamentals of the architectural survey.

Description:
Introduction. Concepts and fundamentals of the architectural survey. History of architectural representation and instrumentation for surveys.

Full-or-part-time: 3h
Theory classes: 3h

2.- Survey methodology

Description:
Survey methodology. Objectives. Drawing scales and their applications. The survey project. Measurement techniques. Drawing and representation techniques. 2D plans and 3D models. CAD work.

Full-or-part-time: 3h
Theory classes: 3h

3.- Lifting with simple instruments

Description:
Topographic survey with basic instruments. Tape measures, plumb bobs and levels. Trilateration / Triangulation. Floor and elevation measurements. Measurement of inaccessible areas. Auxiliary instruments: poles, plumb bobs, etc.

Related activities:
1.- Survey with simple systems. Sketch of a small building or element. CAD drawing.

Full-or-part-time: 3h
Theory classes: 1h 30m
Guided activities: 1h 30m

4.- Topographic techniques

Description:
Topographic techniques. Principles of topography. Topographic instruments. Topographic methodology. Mass capture systems using terrestrial laser scanners

Related activities:
2.- Topographic survey. Main network. Support net. Polygonal. Detail network.

Full-or-part-time: 6h
Theory classes: 3h
Practical classes: 3h

5.- Photographic techniques

Description:
Photographic techniques. Principles of digital photography. Basic concepts. Types of cameras. Objectives. The photographic taking and its planning. Use of photography in the survey.

Related activities:
3.- Photogrammetry Practices. Photographic coverage. Photographic correction. Obtaining stereoscopic pairs and field support. Orthophotography.

Full-or-part-time: 6h 30m
Theory classes: 1h 30m
Practical classes: 5h

6.- Principles of photogrammetry

Description:
Principles of photogrammetry. Historical review. Photography as perspective. Geometric and mathematical principles. Photogrammetric cameras. Digital photographic rectification of flat elements. Photogrammetric systems. Structure from Motion (SfM).

Full-or-part-time: 9h
Theory classes: 3h
Laboratory classes: 3h
Guided activities: 3h

7.- Cabinet work

Description:
Cabinet work. Concatenation of lifting techniques. 2D / 3D drawing. Representation rules.

Full-or-part-time: 4h 30m
Theory classes: 1h 30m
Guided activities: 3h

8.- Coding of constructive solutions

Description:
Coding of constructive solutions, constructive-architectural details, representation of injuries, etc.

Full-or-part-time: 3h
Theory classes: 3h

9. Special lift

Description:
Lifting of a building.

Related activities:
4.- Practices with terrestrial laser scanner (TLS). Obtaining 3D data, editing and obtaining plans, elevations and sections. Orthoimages.
5.- Lifting of a building.

Full-or-part-time: 7h
Practical classes: 1h 30m
Guided activities: 5h 30m

GRADING SYSTEM

The final grade is the sum of the following partial grades:
Classroom activities: 50%
Final work report 30%
Course work shared with the other subjects, group work 20%

Final work: Planning and execution of an architectural and / or archaeological survey. A report of all the works and detailed plans will be delivered.

BIBLIOGRAPHY

Basic:
- Almagro Gorbea, Antonio. Levantamiento arquitectónico. Granada: Universidad de Granada, 2004. ISBN 8433831909.
- Atkinson, K.B. Close range photogrammetry and machine vision [on line]. Caithness, UK: Whittles, 2001 [Consultation: 06/07/2020]. Available on: https://ebookcentral.proquest.com/lib/upcatalunya-ebooks/detail.action?docID=5311623. ISBN 1870325737.
- Cramer, Johannes. Levantamiento topográfico en la construcción: medición y reconocimiento. Barcelona: Gustavo Gili, 1986. ISBN 8425212804.
- Domínguez García-Tejero, Francisco. Topografía general y aplicada. 13ª. Madrid [etc.]: Mundi-Prensa, 1998. ISBN 9788471147219.
- Método RehabiMed : arquitectura tradicional mediterránea = Rehabimed method : traditional mediterranean architecture. Barcelona: Col·legi d'Aparelladors i Arquitectes Tècnics de Barcelona : RehabiMed, DL 2007. ISBN 8487104770.

Complementary:
- Greve, C.W. . Digital photogrammetry: an addendum to the Manual of photogrammetry. Bethesda, Maryland: American Society of Photogrammetry and Remote Sensing, 1996. ISBN 1570830371.
- Lerma García, José Luis. Fotogrametría moderna: analítica y digital. Valencia: Editorial de la UPV, 2002. ISBN 8497052102.
- Lerma García, José Luis; Biosca Tarongers, Josep Miquel. 3D RiskMapping: teoría y práctica del escaneado láser terrestre [on line]. València: Universitat Politècnica de València, 2008 [Consultation: 06/07/2020]. Available on: http://jllerma.webs.upv.es/pdfs/Leonardo_Tutorial_Final_vers5_SPANISH.pdf.

RESOURCES

Hyperlink:
- ICOMOS. Título: Carta internacional sobre la conservación y la restauración de monumentos y de conjuntos histórico-artísticos, II Congreso Internacional de Arquitectos y Técnicos de Monumentos Históricos, Venecia 1964. Aprobada por ICOMOS el 1965.. https://www.icomos.org/charters/venice_sp.pdf- INTBAU. https://www.intbau.org/info/- https://www.rehabimed.net/. Resource