

SUBJECT TEACHING GUIDE

G1968 - Graphic Modelling (BIM)

Degree in Civil Engineering
First Degree in Civil Engineering

Academic year 2024-2025

1. IDENTIFYING DATA					
Degree	Degree in Civil Engineering First Degree in Civil Engineering			Type and Year	Compulsory. Year 2 Compulsory. Year 2
Faculty	School of civil Engineering				
Discipline	GRAPHIC MODELS IN ENGINEERING				
Course unit title and code	G1968 - Graphic Modelling (BIM)				
Number of ECTS credits allocated	6	Term	Semester based (2)		
Web					
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. INGENIERIA GEOGRAFICA Y TECNICAS DE EXPRESION GRAFICA				
Name of lecturer	CESAR ANTONIO OTERO GONZALEZ				
E-mail	cesar.otero@unican.es				
Office	E.T.S. de Ingenieros de Caminos, Canales y Puertos. Planta: + 2. DESPACHO PROFESORES (2034)				
Other lecturers	CRISTINA MANCHADO DEL VAL PEDRO LASTRA GONZALEZ				

3.1 LEARNING OUTCOMES

- Describe the different levels of maturity and definition in BIM methodologies .
- Explain the different stages of the life cycle of a civil work .
- Select the most appropriate technique for creating different families .
- Identify the basic components of a linear work: alignments, elevations and type sections.
- Solve the modeling of a linear work.
- Identify the basic elements of structural engineering applied to buildings and structures.
- Demonstrate the handling in the creation of the different necessary structural components in building and structures .
- Solve the location of a model in the field.
- Identify the modeling components in air conditioning, electrical and sanitation installations.
- Create realistic infrastructure and civil works models

4. OBJECTIVES

- Know the principles and foundations of BIM as a Methodology for the Development of Civil Works throughout its life cycle .
- Know the principles and foundations of BIM in its technological facet.
- Understand the scope, meaning and importance of Digital Transformation and Industry 4.0
- In particular, understand and adequately handle concepts and skills related to the BIM MODELING PHASE.
- Also in particular, mastering the specific processes of GRAPHIC MODELING aimed at Project Presentations and Solutions as well as the generation of Federated BIM Models.
- Understand the duality REAL MODEL - VIRTUAL MODEL that underlies the BIM methodology and its implications throughout the life cycle of a Civil Infrastructure.
- Begin to understand the scope of the Collaborative mode of work throughout the life cycle of Civil Works .

6. SUBJECT PROGRAM

CONTENTS	
1	Introduction Parametric design with Inventor revisited
2	USE OF 3D AUTHOR MODELLING: LINEAR WORKS Civil 3D. Terrains. Grading. Alignments. Elevations. Assemblies. Corridors. An evolutionary story of CAD. Conceptua foundation of BIM. BAsic elements of BIM
3	USE OF 3D AUTHOR MODELLING: AEC, MEP. COORDINATION. Revit: arquitectural, structural. Families. Terrains, Layouts and Renderings. IFC Export The BIM Data Model for Revit. Federated Model. Other BIM elements.
4	USE OF REVIEW DESIGN AND PLANNING Infraworks. Presentation and data access. Corridors. Bridges. Tunnels. Drainage. BIM: collaboration. BEP. MDPI. Oher elements. The BIM Virtual Model at the different stages of the life cycle of civil works.
5	Tutorships, Self Assessment, Deliverables, Evaluation / Assessment

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Tests of Skills with BIM 3D Modelling Tools	Laboratory evaluation	No	Yes	60,00
Individual work on Parametric Design and BIM Methodological Foundations	Work	No	Yes	40,00
TOTAL				100,00
Observations				
- Please contact the lecturer in charge to receive a detailed description regarding assessment and best practises suggestions.				
Observations for part-time students				
Part-time students must complete all exercises and works proposed in the classes.				
The evaluation of part-time students is the same as that of other full-time students.				

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

GUIONES DE LA ASIGNATURA MODELADO GRÁFICO BIM. CÉSAR OTERO. 2020. AULA VIRTUAL UNIVERSIDAD DE CANTABRIA.

CLASES ONLINE DEL MÁSTER BIM PARA INGENIERIA CIVIL. CIVIL 3D. V. GOMEZ, C. MANCHADO, A. DÍAZ, C. OTERO. 2016. AULA VIRTUAL UNIVERSIDAD DE CANTABRIA.

CLASES ONLINE DEL MÁSTER BIM PARA INGENIERIA CIVIL. REVIT. C. MANCHADO, A. DÍAZ, V. GÓMEZ, C. OTERO. 2019. AULA VIRTUAL UNIVERSIDAD DE CANTABRIA.

CLASES ONLINE DEL MÁSTER BIM PARA INGENIERIA CIVIL. INFRAWORKS. A. DÍAZ, C. MANCHADO, V. GÓMEZ, C. OTERO. 2019. AULA VIRTUAL UNIVERSIDAD DE CANTABRIA.