

SUBJECT TEACHING GUIDE

G1968 - Graphic Modelling (BIM)

Degree in Civil Engineering

Academic year 2023-2024

1. IDENTIFYING DATA					
Degree	Degree in Civil Engineering			Type and Year	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 Tools	Laboratory evaluation	No	Yes	60,00
Assesment of Methodological Foundation	Activity evaluation with Virtual Media	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 face-to-face practices.				
The evaluation of part-time students is the same as that of other full-time students.				

8. BIBLIOGRAPHY AND TEACHING MATERIALS
BASIC
<p>GUIONES DE LA ASIGNATURA MODELADO GRÁFICO BIM. CÉSAR OTERO. 2020. AULA VIRTUAL UNIVERSIDAD DE CANTABRIA.</p> <p>CLASES ONLINE DEL MÁSTER BIM PARA INGENIERIA CIVIL. CIVIL 3D. V. GOMEZ, C. MANCHADO, A. DÍAZ, C. OTERO. 2016. AULA VIRTUAL UNIVERSIDAD DE CANTABRIA.</p> <p>CLASES ONLINE DEL MÁSTER BIM PARA INGENIERIA CIVIL. REVIT. C. MANCHADO, A. DÍAZ, V. GÓMEZ, C. OTERO. 2019. AULA VIRTUAL UNIVERSIDAD DE CANTABRIA.</p> <p>CLASES ONLINE DEL MÁSTER BIM PARA INGENIERIA CIVIL. INFRAWORKS. A. DÍAZ, C. MANCHADO, V. GÓMEZ, C. OTERO. 2019. AULA VIRTUAL UNIVERSIDAD DE CANTABRIA.</p>