



Course guide

310406 - 310406 - Building Management with Building Information Modelling (BIM)

Last modified: 24/11/2023

Unit in charge: Barcelona School of Building Construction
Teaching unit: 753 - TA - Department of Architectural Technology.

Degree: MASTER'S DEGREE IN ADVANCED BUILDING CONSTRUCTION (Syllabus 2014). (Optional subject).

Academic year: 2023 **ECTS Credits:** 5.0 **Languages:** Spanish

LECTURER

Coordinating lecturer: Eloi Coloma Picó

Others: Eloi Coloma Picó

PRIOR SKILLS

- Interest in working methodologies integrated using digital tools.
- Self-learning ability about handling digital tools.
- Some experience in handling three-dimensional CAD tools.

REQUIREMENTS

- Class attendance is mandatory.
- It is necessary to do all self-learning exercises indicated during the course.
- Students must have own laptop with Intel i3 processor and 4GB of RAM or higher.
- Students have to register, download and install www.students.autodesk.com Autodesk Revit 2015.

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

6. Design and measure reinforcements of structural elements.
10. Define the characteristics of the seismic action and apply the present regulations to the seismic calculation of structures in building construction.

Generical:

8. Analyse, evaluate and synthesise critically, new and difficult ideas of promotion, in academic and professional contexts, scientific advances, technologic, social or cultural in the society of knowledge.
7. Prepare to communicate with efficiency, orally but also in written.
9. Develop and/or apply ideas with originality in a context of investigation, identifying and formulating hypothesis or innovative ideas and submit them to a objectivity, coherence, and viability test.

Transversal:

11. TEAMWORK. Being able to work as a team player, either as a member or as a leader. Contributing to projects pragmatically and responsibly, by reaching commitments in accordance to the resources that are available.
12. 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:

2. Possess and understand knowledge which provide a basis or opportunity to be original in the development and/or application of ideas, usually in a context of research.
3. The students must be able to apply the acquired knowledges and their ability of resolution of problems in new or little known environments inside more wide environments (or multidisciplinary) related with their study field.
4. The students must be able to integrate knowledges and front to the complexity to formulate opinions from an information which, being incomplete or limited, includes reflections about the social and ethical responsibilities linked to the application of their knowledges and opinions.
5. The students must be able to communicate their conclusions and the knowledges and ultimate reasons which support to specialised and non-specialised audiences in a clear mode and without ambiguities.
1. The students must possess the learning abilities which allow them to continue studying in a way which should be to a large extent self-directed and autonomous.

TEACHING METHODOLOGY

- This course uses a problem solving learning methodology. This means that the students are encouraged to learn by their selves from a series of master classes trying to solve a problems of their interest.
- During the first part of the course a framework of supervised study will be established, from which students are expected to make its own learning development. Thereafter, work sessions will be alternated with lectures whose programming will be adapted to the needs identified during the works course.

LEARNING OBJECTIVES OF THE SUBJECT

- Understanding the of BIM methodology main principles.
- Understanding of the BIM process and the benefits of using BIM management.
- Acquire the ability to apply BIM to the whole building life cycle
- Be able to define the use of BIM in a specific case.

STUDY LOAD

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

Total learning time: 125 h

CONTENTS

Building management through BIM

Description:

- Conceptual Modeling
- Modeling Detailing
- Managing the Meta-Data
- Management Components
- Planning
- Coordination of multidisciplinary teams
- BIM as business model
- On-demand content

Specific objectives:

- Understanding the of BIM methodology main principles.
- Understanding of the BIM process and the benefits of using BIM management.
- Acquire the ability to apply BIM to the whole building life cycle
- Be able to design a business model through BIM.

Related activities:

- Learning about specific tools for modeling and analysis BIM models
- Creation of a business model based on the BIM use.
- Development of a product prototype which business model is based on.
- Evaluation of the value of the BIM product.

Related competencies :

CG2. Prepare to communicate with efficiency, orally but also in written.

CG4. Develop and/or apply ideas with originality in a context of investigation, identifying and formulating hypothesis or innovative ideas and submit them to a objectivity, coherence, and viability test.

CG5. Analyse, evaluate and synthesise critically, new and difficult ideas of promotion, in academic and professional contexts, scientific advances, technologic, social or cultural in the society of knowledge.

CE11. Design and measure reinforcements of structural elements.

CE12. Define the characteristics of the seismic action and apply the present regulations to the seismic calculation of structures in building construction.

05 TEQ. TEAMWORK. Being able to work as a team player, either as a member or as a leader. Contributing to projects pragmatically and responsibly, by reaching commitments in accordance to the resources that are available.

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.

CB10. The students must possess the learning abilities which allow them to continue studying in a way which should be to a large extent self-directed and autonomous.

CB6. Possess and understand knowledge which provide a basis or opportunity to be original in the development and/or application of ideas, usually in a context of research.

CB7. The students must be able to apply the acquired knowledges and their ability of resolution of problems in new or little known environments inside more wide environments (or multidisciplinary) related with their study field.

CB8. The students must be able to integrate knowledges and front to the complexity to formulate opinions from an information which, being incomplete or limited, includes reflections about the social and ethical responsibilities linked to the application of their knowledges and opinions.

CB9. The students must be able to communicate their conclusions and the knowledges and ultimate reasons which support to specialised and non-specialised audiences in a clear mode and without ambiguities.

Full-or-part-time: 125h

Theory classes: 20h

Guided activities: 10h

Self study : 95h

GRADING SYSTEM

- Students will be assessed through a multiple choice theory test, individual project and a group project.

BIBLIOGRAPHY

Basic:

- Eastman, Chuck; Teicholz, Paul; Sacks, Rafael; Liston, Kathleen. BIM handbook : a guide to building information modeling for owners, managers, designers, engineers, and contactors. Hoboken, NJ: Wiley, 2008. ISBN 978047018525.
- Deutsch, Randy. BIM and integrated design : strategies for architectural practice. Boston[etc.]: The American Institute of Architects, 2011. ISBN 9780470572511.
- Shades of grey blog [on line]. Available on: <http://grevity.blogspot.com.es/>.- BIM thinkspace webpage [on line]. Available on: <http://www.bimthinkspace.com/>.- Revit OpEd blog [on line]. Available on: <http://revitoped.blogspot.com.es/>.- Jernigan, Finith E. Big BIM, little BIM : the practical aproach to building information modeling : integrated practice done the right way. 2nd ed. Salisbury, MD: 4Site Press, 2008. ISBN 9780979569920.
- Mattos, Aldo D. Métodos de planificación y control de obras : del diagrama de barras al BIM. Barcelona: Reverté, 2014. ISBN 9788429131048.
- Practical BIM blog [on line]. Available on: <http://practicalbim.blogspot.com.es/>.- Buildz blog [on line]. Available on: <http://buildz.blogspot.com.es/>.

Complementary:

- Lévy, François. BIM in small-scale sustainable design. New Jersey: Wiley, 2012. ISBN 9780470590898.
- Kymmell, Willem. Building information modeling : planning and managing construction projects with 4D CAD and simulations. New York, [etc.]: McGrawHill, 2008. ISBN 9780071494533.
- Fuentes Giner, Begoña. Impacto de BIM en el proceso constructivo español. Valencia: EUBIM, 2014. ISBN 9788494259319.
- Coloma Picó, Eloi. Tecnologia BIM per al disseny arquitectònic [on line]. 2011 Available on: <http://www.practicaintegrada.com/storage/tecnologiabim/TecnologiaBIM.pdf>.
- Krygiel, Eddy. Green BIM : successful sustainable design with building information modeling. Indianapolis: Wiley, 2008. ISBN 9780470239605.
- Hardin, Brad. BIM and construction modeling : proven tools, methods, and workflows. Indianapolis: Wiley, 2009. ISBN 9780470402351.
- Teicholz, Paul. BIM for facility managers. Hoboken, NJ: John Wiley, 2013. ISBN 9781118382813.
- Kensek, Karen; Noble, Douglas. Building information modeling: BIM in current and future practice. Hoboken, NJ: Wiley, 2014. ISBN 9781118766309.
- Hardin, Brad. BIM and construction modeling : proven tools, methods, and workflows. Indianapolis: Wiley, 2009. ISBN 9780470402351.