

Course guides

210270 - MEB - From Rough Material to Design with Parametric Tools

Last modified: 15/07/2020

Unit in charge: Barcelona School of Architecture
Teaching unit: 735 - PA - Department of Architectural Design.
Degree: DEGREE IN ARCHITECTURE STUDIES (Syllabus 2014). (Optional subject).
DEGREE IN ARCHITECTURE (Syllabus 2010). (Optional subject).

Academic year: 2020 **ECTS Credits:** 5.0 **Languages:** English

LECTURER

Coordinating lecturer: MARTA DOMÈNECH RODRÍGUEZ
Others: Primer quadrimestre:
MARTA DOMÈNECH RODRÍGUEZ - 14

PRIOR SKILLS

We will learn to project taking into account the subject we use and the laws associated with it. Therefore, in addition to designing, we will end up building all together what we have planned. This course, we will learn from earth construction (raw, stabilized and cooked) and recycled materials from the school. Expertise is not a must, the only requirement is the wish to experience a great moment facing the matter and the small construction.

REQUIREMENTS

To take this subject, it is necessary to have passed Projects I and II (2nd course bachelor)

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

EP20. Translation from Spanish slope
EP22. Translation from Spanish slope
EP23. Translation from Spanish slope
EP19. Translation from Spanish slope
EAB1. Translation from Spanish slope
EP15. Translation from Spanish slope

Generical:

CG4. Translation from Spanish slope
CG1. Translation from Spanish slope

Transversal:

CT2. Translation from Spanish slope
CT4. Translation from Spanish slope
CT5. Translation from Spanish slope
CG3-2010. Independent learning: Ability to identify and overcome the gaps in one's own knowledge by means of critical reflection and choice of the best approach to extending one's knowledge.
CG7-2010. Third language: Knowledge of a third language, preferably English, to the level of oral and written proficiency that graduates will need in their careers.



Basic:

- CB1. Translation from Spanish slope
- CB2. Translation from Spanish slope
- CB3. Translation from Spanish slope
- CB4. Translation from Spanish slope
- CB5. Translation from Spanish slope

TEACHING METHODOLOGY

Classroom activities: Hours / week
Master class / expository method 1,0
Project-based learning 1,0
Group work 2,0

Non-contact activities: Hours / semester
Self-learning 15

LEARNING OBJECTIVES OF THE SUBJECT

The main purpose of this subject is to learn to design taking into account the materials we use. Learn tools to optimize their use and generate less waste.

In this edition we will focus on construction with earth (raw, stabilized or cooked) and with recycled materials.

The objective is to learn from the traditional techniques associated to them and incorporate the contemporary research in the field of digital tools.

STUDY LOAD

Type	Hours	Percentage
Hours large group	55,0	44.00
Self study	70,0	56.00

Total learning time: 125 h

CONTENTS

From raw material to the design with parametric tools

Description:

1. Introduction. Massive construction:
 - Traditional spatial systems associated with massive architecture: Masonry and stereotomy.
 - Material innovation and formal innovation. The new digital tools in an environmentally and economically sustainable architecture.
2. Design solid architecture.
 - Introduction to graphic statics and structural design.
3. Introduction to parametric design and formal optimization tools:
 - Introduction to the new parametric design and formal optimization software (RhinoVAULT2 + COMPAS)
4. Techniques associated with earth construction (raw, stabilized or cooked)
5. Development and construction of a small pavilion: Practice in parametric design + practice in project construction.

Full-or-part-time: 120h

Theory classes: 15h

Practical classes: 15h

Guided activities: 30h

Guided activities: 30h

Self study : 30h



GRADING SYSTEM

Evaluation Evaluation

Continued (%) Final (%)

Individual work and exercises 50 100 (Final exam if continuous evaluation is not passed)

Group work and exercises 50

Project evaluation 100

Description

(brief description of the evaluation system)

A total of 7 exercises are scheduled to be performed in class and will be delivered every two weeks and also, a groupal construction of a small pavilion resulting from the design of the students.

Continuous telematic evaluation

In online teaching situations, the continuous evaluation will be carried out synchronously and asynchronously, by the means established by the University and the Center, with a periodic record of academic activity through submissions, forums, questionnaires or any other means that facilitates the Atenea platform, or alternative tools that are provided to teachers. In situations in which this telematic teaching occurs with face-to-face teaching already started, or for reasons of extra-academic order, the changes in the weights or regular control systems of teaching will be communicated in detail to all students in the Atenea of each subject.

Final telematic evaluation

If the continuous telematic evaluation is not positive, a second evaluation may be carried out, which will consist of a global final test in telematic format established in accordance with the criteria of the responsible teaching staff and the ICT means and tools provided by the University or the Center.

The measures of adaptation to non-contact teaching will be implemented taking into account the ICT security and personal data protection criteria to guarantee compliance with the legislation on Personal Data Protection (RGPD and LOPDGD)

BIBLIOGRAPHY

Basic:

- Ruby, Ilka; Ruby, Andreas. The Materials Book [on line]. Berlin: Ruby Press, 2020 [Consultation: 16/09/2020]. Available on: <https://src.lafargeholcim-foundation.org/dnl/13be990e-c713-4591-b7ff-8aa86e640cbd/F19bk1-TheMaterialsBook.pdf>. ISBN 9783944074320.
- Rauch, Martin. Martin Rauch: refined earth construction and design with rammed earth. Munich: Detail, 2015. ISBN 9783955532734.
- Ruby, Ilka; Ruby, Andreas. Re-inventing Construction [on line]. Berlin, etc.: Holcim Foundation for Sustainable Construction, 2010 Available on: <https://src.lafargeholcim-foundation.org/flip/F10/RIC/36/index.html>. ISBN 9783981343625.
- Hebel, Dirk. SUDU. Berlin: Ruby Press, 2015. ISBN 9783944074115.
- McDonough, William; Braungart, Michael. Cradle to cradle (de la cuna a la cuna) : rediseñando la forma en que hacemos las cosas [on line]. Madrid [etc.]: McGraw-Hill, cop. 2005 [Consultation: 16/09/2020]. Available on: http://www.ingebook.com/ib/NPcd/IB_BooksVis?cod_primaria=1000187&codigo_libro=6705. ISBN 8448142950.

RESOURCES

Other resources:

List of references and tutorials:

1. Rhinoceros + Grasshopper

Tutorials: <https://www.rhino3d.com/tutorials>

Forum: <https://discourse.mcneel.com>

Discussions and tutorials: <http://www.grasshopper3d.com>

2. RhinoVAULT2 + COMPAS

Tutorials: <https://blockresearchgroup.gitbook.io/digitalfutures-2020/>