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1859

Building Information Modelling [BIM]

INTRODUCTION TO THE COURSE

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DRAWING & ARCHITECTURAL REPRESENTATION

Course description

The main objective of the course is to provide the cultural, critical and operational tools necessary to introduce students to the theme of BIM (Building Information Modeling) applied to the process of design, construction and management and maintenance of buildings.

For the achievement of the aims students will be provided with the operational tools necessary for parametric modeling applied to different representation scales, congruently to the different phases of design: a conscious use of LOGs -Level of Geometry) and LOIs (Level of Information) will allow the student to deal with national legislation and directives, international guidelines and standards.

The theoretical treatment referred to the most up-to-date research and international case studies will be combined with application activities to develop students' ability to use BIM critically and consciously, starting from the essential concept of interoperability between software for the optimal management of information, applicable to different disciplines in an effective and efficient way.

Expected Learning Outcomes

Knowledge: at the end of the course the student should demonstrate the ability to govern advanced parametric modeling processes, describing approaches and workflows involving different disciplines, interoperable processes, teamwork.

Skills: the student must demonstrate independence in the analysis and resolution of possible criticalities that may be found in the professional field, not limited to the design phase, but also extended to the subsequent phases of construction and management of buildings. Moreover, the ability to produce graphic and alphanumeric drawings congruent to different scales of representation from general to particular, ranging from the design of volumetric concept to the resolution of construction details, will be assessed.

Know-how: the student will have to develop a learning method that allows him to continue learning in autonomy, consulting web resources, including blogs, forums, communities, websites of companies producing building components and related digital models. In doing so, the student will have to develop an adequate critical sense of constantly evolving approaches, both from a technical and methodological point of view.

Pre-requirements

The knowledge acquired during the Bachelor's Degree in Architecture (L-17) are necessary, in terms of the correct relationship between representation scale and graphic (and informative) contents that can be associated to the different design phases, as well as the knowledge of the main basics related to digital modeling. For the Italian course, the knowledge of the English language is highly desirable in order to study and understand the international literature that will be proposed during the theoretical lessons.

Course topics

BIM (Building Information Modeling)
VPL (Visual Programming Language) - Basics Features
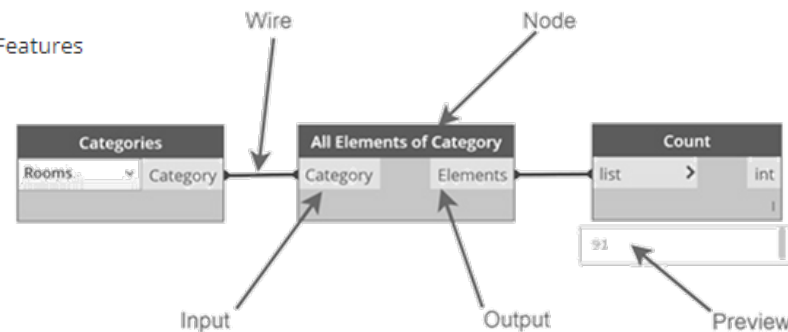
Course structure

It is assumed to divide the course into 6 modules characterized by theoretical lessons (T) and practical activities (P). In parallel to the theoretical and practical modules the students will develop a personal BIM project identifying an appropriate CASE STUDY (18h Q&A and Revisions of student's work)

1/6 - Definitions of BIM, state of the art of BIM practice, software interoperability. (3h T)

2/6 – The role of Standards in BIM processes vs HBIM approaches. (3h T)

3/6 - Use of the parametric modeling in architecture (graphical user interface, templates, relationship between visual information, both numerical and graphic, customization of existing libraries and the creation of new ones etc..). (16h P)

4/6 – Architectural Representation using BIM platform and Rendering (views and layouts) (8h P)

5/6 - Communication of the design data (report, schedules, legends, details) (6h P)

6/6 – Visual Programming Language and BIM environment (6h P)

Reading materials

- Lo Turco M. (2015) Il BIM e la rappresentazione infografica nel processo edilizio. Dieci anni di ricerche e applicazioni - BIM and infographic representation in the construction process. A decade of research and applications. Aracne, Ariccia (RM)
- Sgambelluri M. (2020) Dynamo and Grasshopper for Revit Cheat Sheet Reference Manual. Trade Paperback

Assessment and grading criteria for ONSITE exam

**Exam:** Written test; Compulsory oral exam; Group graphic design project;

The exam will be divided in two parts: the first one is more theoretical and related to the multidisciplinary themes illustrated during the lessons (WRITTEN EXAM). The second part refers to the discussion of the final outcomes of the practical exercise (GRAPHICAL OUTCOMES OF THE CASE STUDY and QUESTION about PRACTICAL APPROACHES to BIM).

Regarding to theory, students will be expected to answer questions about specific topics developed during the lectures and practical activities. The list of topics (that constitutes the basis for the written exam) will be available into the teaching portal.

During the oral examination, students must demonstrate their preparation on the topics addressed during the practical activities by highlighting their contribution in the development of the groupwork.

The final grade will consider the correctness of the GRAPHICAL OUTCOMES produced, the ability to THINK CRITICALLY, in addition to the clarity and properties of language demonstrated during the speech.

EVALUATION CRITERIA: Written exam (40%). Oral presentation and Graphical outcomes produced in groupwork (60%).
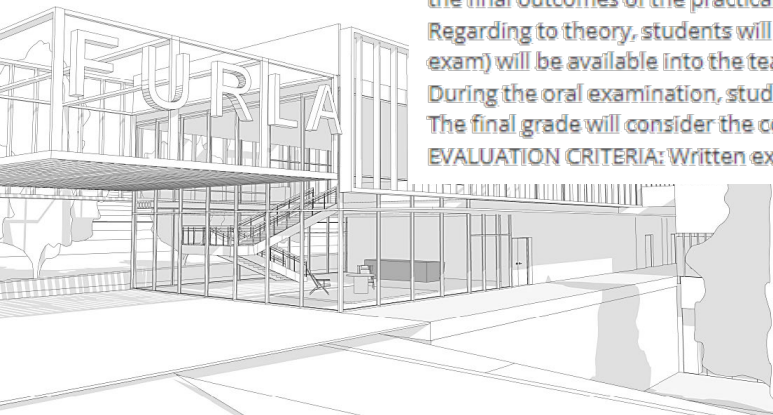
Digital works required for the exam

1 book in A3 format containing all the activities carried out during the course, focusing on a project chosen by the student and appropriately approved by the teacher.

The working groups will be composed by a maximum of **three people.**

The detailed list of the contents to be included in the book will be shown during the course.

During the academic year there will be a control / exemption on the state of progress of the work an (possible **intermediate evaluation**), as well as the level of knowledge acquired by the students, based on the lectures that are taking place during the course.

The book has to contain the necessary and sufficient compositions for the description of the project (plans, elevations, sections, thematic drawings, schedules) with contents consistent with the scale 1:200 and 1:100.

The work will be completed with a data sheet for a brief description of the project, a territorial simplified framework and some three-dimensional elaborations.

The final work will ultimately be summarized in a **A1 format**, in vertical arrangement that represents a **summary of the work**.

Perspective view 1

Perspective view 2

Perspective view 3

Photo 2

Photo 3

Photo 1

Render

Ground floor
1:100

Ground floor
1:50

A.A. 23-24 | Building Information Modeling [BIM]

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