



# UNIVERSITY OF NICOSIA

## ΠΑΝΕΠΙΣΤΗΜΙΟ ΛΕΥΚΩΣΙΑΣ

University of Nicosia, Cyprus

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| <b>Course Code</b><br>ARCH-362                  | <b>Course Title</b><br>Advanced CAD and Mixed<br>Media | <b>ECTS Credits</b><br>4                  |
| <b>Department</b><br>Architecture               | <b>Semester</b><br>Spring                              | <b>Prerequisites</b><br>ARCH-262          |
| <b>Type of Course</b><br>Elective               | <b>Field</b><br>Architecture                           | <b>Language of Instruction</b><br>English |
| <b>Level of Course</b><br>1 <sup>st</sup> Cycle | <b>Year of Study</b><br>3rd                            | <b>Lecturer(s)</b><br>Michalis Georgiou   |
| <b>Mode of Delivery</b><br>face-to-face         | <b>Work Placement</b><br>N/A                           | <b>Co-requisites</b><br>None              |

### Objectives of the Course:

The main objectives of the course are to:

- To teach advanced capabilities of digital design tools for generation, evaluation, and representation
- To introduce and teach the theoretical and practical framework of advanced parametric-associative design tools
- To introduce and teach the use of materials, lights and animation techniques for digital presentations
- To teach digital fabrication techniques encouraging students to use 3d printer, milling machine, and laser cutter

### Learning Outcomes:

After completion of the course students are expected to be able to:

- Demonstrate the use of advanced digital design tools for generation, evaluation and representation
- Discuss in theoretical and practical level the use of parametric-associative design tools
- Explain the relationship between technology and aesthetics
- Demonstrate rendering through presentations of colors, textures, materials and lights – apply animation techniques
- Illustrate how architectural design concepts in various scales can be translated and represented into buildings and plans into planning
- Utilize technology to understand human behavior in the built environment
- Utilize 3d printer, milling machine and laser cutter

### Course Contents:

- Introduction to parametric-associative design logic
- Advanced 3d modelling
- NURBS curves and surfaces
- Transformation actions

- Advanced parametric-associative modelling
- Data, parameters, geometrical entities, etc
- Scripting
- Import, Export files
- Textures, materials, lights, renderings, animation
- Digital Fabrication
- 3D Printer, CNC Milling machine, Laser cutter

**Learning Activities and Teaching Methods:**

Lectures, Computer Demonstrations, Workshops, Tutorials, Discussions, Presentations, Practical Exercises and Assignments.

**Assessment Methods:**

Homework, Project, Mid-Term, Final Project, Presentation

**Required Online Resources:**

| Authors                   | Title                        | Link  |
|---------------------------|------------------------------|---|
| Andrew Payne & Rajaa Issa | Grasshopper Primer           | <a href="http://download.rhino3d.com/Rhino/4.0/Rhino4Training/">http://download.rhino3d.com/Rhino/4.0/Rhino4Training/</a>   |
| Robert McNeel Associates  | Grasshopper online tutorials | <a href="http://en.wiki.mcneel.com/default.aspx/McNeel/ExplicitHistoryExamples.html">http://en.wiki.mcneel.com/default.aspx/McNeel/ExplicitHistoryExamples.html</a> |

**Recommended Textbooks/Reading:**

| Authors                              | Title  | Publisher                     | Year | ISBN          |
|--------------------------------------|--|-------------------------------|------|---------------|
| Douglis, E.                          | Autogenic Structures   | Taylor and Francis            | 2009 | 9780415776905 |
| Iwamoto, L.                          | Digital Fabrications: Architectural and Material Techniques. | Princeton Architectural Press | 2009 | 9781568987903 |
| Kolarevic B.                         | Architecture in the Digital Age: Design and Manufacturing    | Taylor and Francis            | 2005 | 041538141X    |
| Meredith M., Aranda-Lasch, Sasaki M. | From Control to Design: Parametric/Algorithmic Architecture  | Actar                         | 2008 | 8496540790    |