UNIVERSITY of NICOSIA

Course Syllabus

Course Code	Course Title	ECTS Credits
ARCH-570DL	Digital Fabrication	10
Prerequisites	**Department**	**Semester**
None	Architecture	Fall
Type of Course	**Field**	**Language of Instruction**
Required	Design + Fabrication	English
Level of Course	**Lecturer(s)**	**Year of Study**
2nd Cycle	Michalis Georgiou, Odysseas Georgiou	1st
Mode of Delivery	**Work Placement**	**Co-requisites**
Distance Learning	N/A	None

Course Objectives:

The main objectives of the course are to:

- Develop an in depth knowledge and understanding of key concepts in digital fabrication (3D printing, basic programming, computer controlled cutting and computer controlled machining)
- Achieve basic knowledge of computer-aided design (CAD), NC coding and mechanics of CNC machines.
- Teach students to produce both 2D and 3D graphic files for use on fabrication machines.
- Introduce different kinds of design software with an emphasis on open source software.
- Demonstrate and apply the active use of a laser cutter, a CNC machine, a CNC Press Brake, a 3D printer and other available digital fabrication equipment.
- Develop an advanced awareness of materials, their possibilities, capabilities and physical restrictions.
- Acquire an understanding of material jointing and connectivity techniques and restrictions
- Teach students how to identify and implement all necessary procedures to take an idea from envisioning through to final prototype.
- Provide a deeper understanding of technological implications on design procedures and digital fabrication
- Give students a spherical, hands-on experience of design, structure, longevity, sustainability.
- Understand the possibilities of open source practice

Learning Outcomes:

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

1. Are able to produce 2D and 3D graphic files for use on fabrication machines through using open source and commercial applications.
2. Implement and practice basic principles of digital design.
3. Understand concepts of 3D printing, computer controlled cutting and computer controlled machining
4. Use a 3D printer, a CNC milling machine, a robotic arm and a laser cutter.
5. Produce basic code files for machining
6. Design jointing and connections for various materials and fabrication techniques
7. Have developed an understanding of materials, possibilities and restrictions
8. Plan and implement steps to materialize an idea
9. Have acquired enough knowledge to evaluate their project and identify steps for development.
10. Participate and Contribute to the open source community.

Course Contents:

1. Introduction to digital fabrication
2. Introduction to CAD/CAM processes and CNC machinery
3. Designing for Digital Fabrication and Implementing 2D and 3D modelling techniques
4. Additive Manufacturing
5. Subtractive Manufacturing
6. Flexible and Rigid Folding
7. Large Scale Fabrication and Interoperability

Learning Activities and Teaching Methods:

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

Assessment Methods:

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

Required Textbooks / Reading:

Title	Author(s)	Publisher	Year	ISBN
Architecture in the Digital Age: Design and Manufacturing	Kolarevic B.	Taylor and Francis	2005	041538141 X

Recommended Textbooks / Reading:

Title	Author(s)	Publisher	Year	ISBN
Making It: Manufacturing Techniques for Product Design	Chris Lefteri	Laurence King	2012	1856697495
Digital Fabrication in Architecture, Engineering and Construction	Caneparo, Luca	Springer	2014	978-94-007-7137-6
Digital Fabrication	Yuan, Philip, Leach, et al	Tongji University Press	2018	9787560873343
Materials for Design	Chris Lefteri	Laurence King	2014	1780673442
Contemporary Architecture and the Digital Design Process	Peter Szalapaj	Architectural Press, Oxford U.K.	2005	0750657162
Digital Fabrications: Architectural and Material Techniques.	Iwamoto, L.	Princeton Architectural Press	2009	9781568987
3D Printing and Laser Cutting	Geary J. & Renshaw D.	Ian Allan Publishing	2016	0711038414
Material Strategies in Digital Fabrication	Beorkrem C.	Routledge	2017	9781138654204
Understanding 3D Printing	Williams A.	Amazon Media	2013	ASIN:B00DS8RASG (Kindle Edition)