INNO3D Module 3 *Syllabus*

1. Information about the Module

1.1 University	University of Crete (UoC)
1.2 Team	UOC Team
1.3 Trainer_Name	Manolis Koukourakis Manolis Saldaris Chris Trantalidis
1.3 Degree level	Post-university degree

2. Information about the course

Module title	**Industrial and Personal 3D Printers**

3. Time budget

3.1 Number of hours	**3 h**	divided in:	Lecture	**100 mins**	Laboratory/ Project	**80 mins**

3.2 Time budget distribution (hours) for individual activity:	
(a) Individual study (course, obligatory bibliography, etc.)	1
(b) Additional documentation (recommended bibliography, etc.)	0.5
(c) Preparation for seminary/laboratory/project activities	0.5
(d) Peer learning	0
(e) Exam preparation	0
(f) Other activities	0

3.3 Total individual study (sum (3.2(a)...3.2(f)))	**2 h**
3.4 Grand total (3.1+3.3)	**5h**
3.5 ECTS credits	**0.2**

4. Preconditions

4.1 curriculum	Librarian
4.2 competences	Spatial awareness, technical skills, computer using knowledge

5. Course requirement

5.1. for lecture	Lecture room with video projector, laptop, audio equipment
5.2. for seminary/ laboratory/ project	Laboratory room with video projector, laptop, 3D printers

6. Gained competences

Professional competences	1. Explaining concepts specific processes and solving engineering problems phased expert on mathematical algorithms and basic knowledge of mechanics 2. Develop technical project execution for partial assemblies basic 3. Competences in organizing new services in libraries 4. Competences in managing a Makerspace in libraries

Transversal competences	1. Familiarity with specific roles and teamwork activities and distributing tasks to subordinate levels 2. Familiarity with new business models in libraries

7. Course objective

7.1 General objective	Understanding the main characteristics of industrial and personal 3D printers, their fields of application and the critical processing parameters of the commercial 3D printers
7.2 Specific objectives	Learners should be able to: - understand the main differences between industrial and personal 3D printers ; - understand the advantages and limitations of 3D printing for different applications - understand the printing technologies adequate for 3D printing in industry ; - understand the crucial processing parameters of the commercial 3D printers and the way they affect the properties of the final 3D output ; - identify new library services

8. Contents

8.1 Lecture	Hours	Teaching methods	Observation
Industrial and Personal 3D Printers		Video projector exposure methods, whiteboard explanations and discussions	
3.1 Types of Industrial and Personal 3D Printers 3.1.1 The use of 3D printing technologies in industry (Economies of scale, On demand manufacturing, Product Personalization, Flexibility) 3.1.2 Technologies (Vat Photopolymerization, Resins, Material Jetting, Binder Jetting, Material Extrusion, Powder Bed Fusion, Sheet Lamination, Directed Energy Deposition) 3.1.3 Differences between industrial and personal 3D printers	40 mins		
3.2 Commercial 3D industrial Printers	15 mins		
3.3 Commercial 3D personal Printers	15 mins		
3.4 Processing Parameters of the Commercial 3D Printers 3.4.1 Machine parameters 3.4.2 Working parameters	30 mins		
8.2 Seminary / Laboratory / Project	Hours	Teaching methods	Observation

Industrial and Personal 3D Printers			
3.1 Differences between industrial and personal 3D printers explained 3.2 The use of 3D printing technologies in industry - examples	30 mins	Video projector exposure methods, whiteboard explanations and discussions	
3.2 Commercial 3D industrial Printers examples	15 mins		
3.3 Commercial 3D personal Printers examples	15 mins		
3.4 Processing Parameters of the Commercial 3D Printers explained 3.4.1 Machine parameters showcases 3.4.2 Working parameters showcases	20 mins		

8. 3 Bibliography:

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(3) Dudescu, C., & Racz, L. (2017). Effects of Raster Orientation, Infill Rate and Infill Pattern on the Mechanical Properties of 3D Printed Materials. ACTA Universitatis Cibiniensis, 69(1), 23-30. doi: 10.1515/aucts-2017-0004.

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materials, and printing parameters. Open Engineering, 11(1), 639-649. https://doi.org/10.1515/eng-2021-0063
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9. Evaluation at the end of the course