

ΞΞΕ791-4th INDUSTRIAL REVOLUTION IN FURNITURE INDUSTRY

1. GENERAL

SCHOOL	School of Technology		
DEPARTMENT	Department of Forestry, Wood Sciences, and Design		
LEVEL	<i>Undergraduate</i>		
CODE	ΞΞΕ791	STUDENT SEMESTER	7 th
COURSE TITLE	4 th Industrial Revolution in Furniture Industry		
ACTIVITIES		WEEKLY HRS	ECTS
	Lectures and Workshops	3	6
TYPE OF COURSE	Scientific area		
PREREQUISITES:	None		
LANGUAGE TEACHING AND EXAMINATION:	Greek		
THE COURSE OFFERED TO STUDENTS ERASMUS	No		
WEBPAGES COURSE (URL)	https://eclass.uth.gr/courses/FWSD_U_153/		

2. LEARNING OUTCOMES

Learning Outcomes
<p>The aim of the course is to provide basic knowledge concerning 4th Industrial Revolution (Industry 4.0) with emphasis on main technologies applied in smart factories and digitized production.</p> <p>At the end of the course students will be able to:</p> <ul style="list-style-type: none"> • Have knowledge of the main concepts challenges and opportunities related with 4th Industrial Revolution • Understand the actions that need to be taken from individuals and organisations in order to exploit the advantages of Industry 4.0 technologies • Determine the changes that need to be made to factory subsystems to utilise Industry 4.0 technologies • Understand the transformations need to transform a production process to digitized form • Recognise the main advantages and prospects of digitized production • Have an understanding of the main concepts of Internet of Things, Big Data Analytics and Virtual/Augmented Reality • Know about the main software tools for digitized production management • Have knowledge of the methods that can be applied to design automated digital production systems
General Skills
<p>Upon successful completion of the course, the students will be able to develop and cultivate basic professional and social skills:</p> <ul style="list-style-type: none"> • Search, analysis and synthesis of data and information, using the necessary technologies

- Adaptation to new situations
- Decision making
- Autonomous work
- Teamwork
- Demonstration of social, professional and moral responsibility and sensitivity to gender issues
- Exercise criticism and self-criticism
- Promoting free, creative and inductive thinking

3. COURSE CONTENT

In the theoretic part the following topics are described:

Basic Industry 4.0 concepts. Digital production technologies. Basic Intelligent Systems concepts and techniques. Basic concepts and technologies of Internet of Things, Big Data Analytics, Cloud computing, and Virtual/Augmented Reality. Intelligent System Applications in Industry. Digitized production systems design. Digitized production management software tools. Case studies of Industry 4.0 applications in the Industry.

Students develop final semester assignments in groups. Course lectures and other activities are supported by workshops, where each student team is discussing their work and seeking solutions to any problems it faces or specialized knowledge about specific aspects of its work.

The final semester assignment requires submission of the assignment materials as well as a 10 minute oral presentation at week 12. The semester assignment counts for 20% of the total course assessment and the remaining 80% is obtained through written examination.

4. TEACHING AND LEARNING METHODS - EVALUATION

DELIVERY METHOD	Face to face	
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Use of a course website on the e-class platform for posting (a) notes, (b) internet links, (c) announcements, search tools and social networks Furthermore, use of equipment such as video projector, interactive board, and use of server and terminal stations at the laboratory room.	
TEACHING ORGANISATION	Activity	Semester Workload
	Interactive Teaching – Lectures	26
	Studio workshops	25
	Semester assignments	50
	Self-study	49
	Course Total	150
STUDENT EVALUATION	Both intermediate and final evaluation is applied. The evaluation of the theoretical part is carried out by: <ol style="list-style-type: none"> 1. Optional intermediate written examination 2. Semester assignment 3. Final written exam 	

5. RECOMMENDED-BIBLIOGRAPHY

- *Recommended literature:*

- Ustundag, A. and E. Cevikcan (2018). Industry 4.0: Managing The Digital Transformation, Springer.
- Gilchrist, A. (2016). Industry 4.0: The Industrial Internet of Things, Apress.
- Russell, S., & Norvig, P. (1995). Artificial Intelligence: A modern approach. Prentice-Hall, Englewood Cliffs, 25.
- Schwab, K. (2017). The Fourth Industrial Revolution, Crown Business.
- Yan, L., Zhang, Y., Yang, L. T., & Ning, H. (2008). The Internet of Things: From RFID to the Next-Generation Pervasive Networked Systems (Wireless Networks and Mobile Communications). CRC Press.
- Lu, Y. (2017). "Industry 4.0: A survey on technologies, applications and open research issues." Journal of Industrial Information Integration 6: 1-10.
- Liao, Y., F. Deschamps, E. d. F. R. Loures and L. F. P. Ramos (2017). "Past, present and future of Industry 4.0 - a systematic literature review and research agenda proposal." International Journal of Production Research 55(12): 3609-3629.
- Chen, B., J. Wan, L. Shu, P. Li, M. Mukherjee and B. Yin (2018). "Smart Factory of Industry 4.0: Key Technologies, Application Case, and Challenges." IEEE Access 6: 6505-6519.
- Santos, M. Y., J. Oliveira e Sá, C. Costa, J. Galvão, C. Andrade, B. Martinho, F. V. Lima and E. Costa (2017). A Big Data Analytics Architecture for Industry 4.0, Cham, Springer International Publishing.
- Yang, J., Y. Chen, W. Huang and Y. Li (2017). Survey on artificial intelligence for additive manufacturing. 2017 23rd International Conference on Automation and Computing (ICAC).

- *Relevant scientific journals:*

- Transactions in Autonomous Adaptive Systems
- Journal of Manufacturing Technology Management
- Journal of Intelligent Manufacturing
- Transactions on Industrial Informatics