

COURSE OUTLINE

1. GENERAL

SCHOOL	APPLIED SCIENCES		
DEPARTMENT	DIGITAL MEDIA AND COMMUNICATION		
LEVEL OF STUDY	UNDERGRADUATE		
COURSE UNIT CODE	DMC 563	SEMESTER OF STUDY	
COURSE TITLE	3D DIGITAL TECHNOLOGIES		
COURSEWORK BREAKDOWN		TEACHING WEEKLY HOURS	ECTS Credits
		Lectures	2
		Lab exercises	2
		<i>Total</i>	4
COURSE UNIT TYPE	Elective, General Course Infrastructure		
PREREQUISITES :	-		
LANGUAGE OF INSTRUCTION/EXAMS:	GREEK		
COURSE DELIVERED TO ERASMUS STUDENTS	Yes (in English)		
MODULE WEB PAGE (URL)	TBA		

2. LEARNING OUTCOMES

Learning Outcomes

This course provides an introduction to 3D technologies.

3D technologies are today present in various fields of application such as 3D graphics, 3D video, 3D animation, 3D scanning and printing, virtual reality, etc. The purpose of this course is to provide students with solid theoretical knowledge and skills on 3D technologies. Students will have the opportunity to have hands on experience with some of the 3D technologies such as 3D graphic creation, 3D scanning, and 3D video (capturing and display) that exist in the Department of Digital Media and Communication.

Upon successful completion of the course a student must be able to:

1. To comprehend the various 3D technologies (graphics, video, scanning, printing, animation etc) and the basic principles of operation.
2. To demonstrate solid knowledge on the various fields of application.
3. To evaluate and select 3D technologies the 3D technologies that can be used for specific communication purposes.
4. To adapt and upgrade their knowledge to the rapid changes of 3D technology.

General Skills

- Teamwork
- Critical thinking
- Working in interdisciplinary field
- Free, creative and inductive thought

- Search, Analysis and Synthesis of data and information with the use of necessary technologies.

3. COURSE CONTENTS

- Milestones in 3D technologies
- 3D graphic design software and basic principles of 3D graphics production.
- 3D video. Capturing and display technologies. 3D video editing.
- 3D animation.
- 3D scanning and 3D printing.
- Virtual reality applications

1. TEACHING METHODS - ASSESSMENT

MODE OF DELIVERY	In-Class	
USE OF INFORMATION AND COMMUNICATION TECHNOLOGY	3D video camera, 3D TV, 3D projector, 3D editing software 3D scanning 3D Graphics Creation software Support of the learning process through the e-class platform. Support of the learning process through video lessons.	
TEACHING METHODS	Method description	Semester Workload
	Lectures	26
	Lab exercises	26
	Personal Study	48
	Total	100
ASSESSMENT METHODS	I. End of Semester Formal Examination (60%) - Short answer questions - Essay questions - Questions of solving communication problems. II. Lab examination 40%	

2. RESOURCES

- Recommended Book Resources:

- Randi L. Derakshani, Dariush Derakshani (2011), Autodesk 3ds Max 2011 Guide, M. Giourdas Publications
- John Edgar Park (2004) Understanding 3D Animation using Maya, Springer

-Recommended Articles/papers:

- Gao Y. (2013), Research of Efficiency of Computer 3D Animation, Applied Mechanics and Material, Vol. 421, pp. 672-675.
- Chen Y. Fang, K., Bu, W. Zhang, X., Lei, M. (2013), Research on animation design of growing plant based on 3D MAX technology, Proc. SPIE 8761, PIAGENG 2013: Image Processing and Photonics for Agricultural Engineering,

- Teran J, Sifakis E, Blemker S et al (2005) Creating and simulating skeletal muscle from the visible human data set. *IEEE Trans Visualiz Comput Graph* 11(3):317–328
- Yong J. (2014) Design and Implementation of 3D Facial Animation Based on MPEG-4, *Proceedings of the 9th International Symposium on Linear Drives for Industry Applications, Volume 4 Lecture Notes in Electrical Engineering Volume 273*, 2014, pp 753-759
- Liying Huang; Yijian Pei (2010), Film and television animation design based on Maya and AE, 3rd Int. Con. On Image and Signal Processing, Yantai 16-18 Oct, pp. 135-137
- Li, Y. (2006) 3D Character Animation Synthesis From 2D Sketches. In: *Proceedings of the 4th international Conference on Computer graphics and Interactive Techniques in Australasia and Southeast Asia*, pp. 81–90
- Hornung, A., Dekkers, E., Kobbelt, L. (2007) Character animation from 2D pictures and 3D motion data. *ACM Trans. Graph.* 26(1), 1–9.
- Jose´ Carlos Miranda, Xenxo Alvarez, Joao Orvalho, Diego Gutierrez, A. Augusto Sousa, Veronica
- Orvalho (2012) Sketch express: A sketching interface for facial animation, *Computers & Graphics*, Vol. 36(6), pp. 585-595.
- O. Au, C. Tai, H. Chu, D. Cohen-Or, and T. Lee, "Skeleton Extraction by Mesh Contraction," *ACM Trans. on Graphics*, 27(3), Aug. 2008.
- Q. Zheng, F.W.B. Li, Lau, W.H. Rynson (2010), Sketching-Based Skeleton Generation, 3rd Int. Conf. on Ubi-media Computing, Jinhua, 5-6 July, pp. 179-186.
- Robert Held, Ankit Gupta, Brian Curless, and Maneesh Agrawala. 2012. 3D puppetry: a kinect-based interface for 3D animation. In *Proceedings of the 25th annual ACM symposium on User interface software and technology (UIST '12)*. ACM, New York, NY, USA, 423-434.