

MULTIMEDIA TECHNOLOGIES: AUDIO, IMAGE, VIDEO

COURSE OUTLINE

1. GENERAL			
SCHOOL	School of Engineering		
ACADEMIC UNIT	Department of Electrical and Computer Engineering		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	0811.7.026.0	SEMESTER	1st
COURSE TITLE	Multimedia Technologies: Audio, Image, Video		

INDEPENDENT TEACHING ACTIVITIES if credits are awarded for separate components of the course	WEEKLY TEACHING HOURS	CREDITS
	3	2
	1	1
	1	1
Total	5	4

COURSE TYPE general background, special background, specialised general knowledge, skills development	Special background / Core
PREREQUISITE COURSES	None
LANGUAGE OF INSTRUCTION and EXAMINATIONS	English
OFFERED TO ERASMUS STUDENTS	Yes (in English)
COURSE WEBSITE (URL)	https://eclass.hmu.gr/courses/ECE199/

2. LEARNING OUTCOMES
Learning outcomes
The aim of the course is the critical understanding of multimedia collection, representation, processing and management techniques, as well as the acquisition of basic and advanced knowledge in matters of digitization and compression of audio, image and video. Main learning outcomes include: 1. Knowledge of the basic terminology found in scientific texts in the field of multimedia. 2. Critical understanding of the fundamental principles of multimedia content compression (audio, image and video). 3. Knowledge of multimedia information creation & processing techniques and skills of handling specialized software packages for its processing. 4. Familiarity with technical specifications (e.g., ISO, ITU)
General Competences
• Search, analysis and synthesis of data and information, using the necessary technologies • Decision making • Autonomous work • Promoting creative and inductive/deductive thinking

3. SYLLABUS

Theoretical Lecture Units

- Multimedia - Text, audio, image, video, animation. Categories and characteristics of multimedia applications.
- Information digitization - sampling, quantization, compression / encoding.
- General principles of compression. Lossy vs Lossless compression. Entropy and source encoding, RLE, differential or predictive coding. Vector quantization, Transformation encoding.
- Symmetry and asymmetry of compression techniques.
- Compression / encoding standards: PCM, DPCM, APCM, linear and logarithmic coding.
- Sound. Capture and audio compression techniques, MIDI, DCT, MP3.
- Image. Capture and image compression techniques (GIF, JPEG). Vector image.
- Video. Capture and video compression techniques (MPEG, MPEG2, MPEG4, H.264). Animation.
- Large capacity storage media and storage systems.

Laboratory Exercises

- Audio modulation and editing techniques.
- Image modulation, editing techniques, filtering tools.
- Video editing and tools.

4. TEACHING and LEARNING METHODS - EVALUATION

DELIVERY Face-to-face, Distance learning, etc.	In-Class Face-to-Face	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY Use of ICT in teaching, laboratory education, communication with students	• Use of ICTs in lecturing • Use of ICTs for the communication with students via the e-class platform	
TEACHING METHODS The manner and methods of teaching are described in detail.	Activity	Semester workload
	Lectures	39
	Exercises	13
	personal study	68
	Course total	120
STUDENT PERFORMANCE EVALUATION Description of the evaluation procedure	Assessment Methods: • Individual laboratory exercises that require completion of concepts and combination of techniques taught (20%) • Written mid-term with short answer questions and problem solving (20%) • Written final exam with short answer questions and problem solving (60 %) Current course assessment details are posted in eclass.	

5. ATTACHED BIBLIOGRAPHY

Relevant English Texts:

- Fundamentals of Multimedia, Ze-Nian Li, M.S. Drew, J. Liu, 2nd ed., Springer Berlin Heidelberg, 2014, ISBN:9783319052892.
 - Multimedia Systems: Algorithms, Standards, and Industry Practices, P. Havaladar and G. Medioni, Cengage Learning, 2009, ISBN: 9781418835941.
 - Multimedia Systems, R. Steinmetz and K. Nahrstedt, Springer Berlin Heidelberg, 2014, ISBN: 9783662088791.
- Internet Sources:
- <http://www.jpeg.org>
 - <http://www.mpeg.org>

