

ELEC4506 COURSE CATALOG INFO

Course Code : ELEC4506				Course Name : Multimedia Processing and Communications			
Semester	Lecture (Le+T+L)	Local Credit	ECTS	Language	Category	Instructional Methods	Prerequisites
7 or 8	(3+0+0)	3	5	English	Elective	Lecture	ELEC2501
Course Content	Representation, compression, storage, transmission, and processing of multimedia. Signal representation of data and audio, speech, image, graphics, video signals. Multimedia compression techniques and standards. Content-based image and video indexing and retrieval. Fundamental technologies for multimedia communications and networking. Streaming audio and video over Internet and wireless networks. Error resilient communications. Multimedia data hiding and digital watermarking.						
Course Outcomes	CO 1. Explain the basics of sampling theory, quantization and coding. CO 2. Apply transformations/mappings and compute transform coefficients. CO 3. Compute entropy, bitrate and PSNR and recognize multimedia data formats and their application areas. CO 4. Evaluate the current trends and needs in multimedia coding and communication. CO 5. Apply entropy coding techniques to various types of data. CO 6. Design error detection methods for reliable communication. CO 7. Implement multimedia processing, transformation and coding/compression algorithms in MATLAB.						

COURSE PLAN

W1	Introduction to multimedia systems
W2	Multimedia data / information representation and processing (Graphics and image data formats)
W3	Multimedia data / information representation and processing (Fundamental concepts in video)
W4	Multimedia data / information representation and processing (Basics of digital audio)
W5	Multimedia data compression (Lossless and lossy compression)
W6	Multimedia data compression (Text and image compression)
W7	Multimedia data compression (Video compression techniques)
W8	Multimedia data compression (Audio compression techniques)
W9	Multimedia network communications and applications (Digital communication basics)
W10	Multimedia network communications and applications (Digital communication basics)
W11	Multimedia network communications and applications (Multimedia over IP and over

	ATM networks)
W12	Multimedia network communications and applications (Wireless networks)
W13	Multimedia data hiding, digital watermarking
W14	Advanced Topics: Current state of technology in multimedia processing and communications

COURSE ASSESMENT AND ECTS WORK LOAD			
Type of Work	Count	ECTS WORK LOAD	
		Time (Hour)(Including prep. time)	Work Load
Attendance	14	3	42
Final Exam	1	20	20
Quizzes			0
Term project			0
Reports			0
Final Project			0
Seminar			0
Assignments		16	16
Presentation			0
Midterms		20	20
Project		10	10
Laboratory		0	0
Tutorial		0	0
Other(Self study, Paper reviews)		17	17
		Total work load	125
		Total work load/25	5
		ECTS Credit	5

PROGRAM OUTCOMES - COURSE OUTCOMES RELATIONS

PO	Program Outcomes	CO
1	1.1. Adequate knowledge in fundamentals of mathematics (algebra, differential equations, integrals, probability etc), science (physics, chemistry, biology etc.) and computer science (programming and simulation);	
	1.2. ability to use theoretical and applied knowledge in these areas in complex engineering problems.	
2	2.1. Ability to identify, formulate, and solve complex engineering problems;	1,..,4
	2.2. ability to select and apply proper analysis and modeling methods for this purpose.	1,..,4
3	3.1. Ability to design and integrate components of a complex system or process, as they relate to Electrical and Electronics Engineering discipline, under realistic constraints and conditions, in such a way as to meet desired requirements;	
	3.2. ability to apply modern design methods.	
4	4.1. Ability to devise, select, and use techniques and tools needed for analyzing and solving complex problems encountered in engineering practice;	
	4.2. ability to employ information technologies effectively.	
5	5.1. Ability to design experiments,	
	5.2. ability to conduct experiments, gather, analyze and interpret data.	
6	6.1. Ability to work in intra-disciplinary teams;	
	6.2. ability to work in multi-disciplinary teams;	
	6.3. ability to take individual responsibilities.	
7	7.1. Ability to effectively communicate via written and oral means;	
	7.2. knowledge of at least one foreign language;	
	7.3. ability to write effective reports and comprehend written reports;	
	7.4. ability to write design and manufacturing reports	
	7.5. ability to present effectively,	
	7.6. ability to give and follow clear instructions.	

8	8.1. Recognition of the need for lifelong learning;	
	8.2. ability to access information, to follow developments in science and technology, and to continue to educate him/herself.	
9	9.1. Consciousness to behave according to ethical principles, and about professional and ethical responsibility;	
	9.2. knowledge on standards used in engineering practice.	
10	10.1. Knowledge about business life practices such as project management, risk management, and change management;	
	10.2. awareness in entrepreneurship, innovation;	
	10.3. knowledge about sustainable development.	
11	11.1. Knowledge about the global and social effects of engineering practices on health, environment, and safety, and contemporary issues of the century reflected into the field of engineering;	
	11.2. awareness of the legal consequences of engineering solutions.	

Revision Date	Prepared by	Approved by
1.9.2019	Prof. Dr. Ümit Güz	Prof.Dr. Ahmet Aksen
1.6.2021		