AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title	Data Compression								
Course Code	MTK584		Couse Level	Second Cycle (Master's Degree)					
ECTS Credit	8	Workload	200 *(Hours)*	Theory	3	Practice	0	Laboratory	0
Objectives of the Course	The course aims to introduce and to understand the physical significance of fundamental concepts of information theory, and the course aims to provide a deep understanding of lossless and loosely data compression methods in both theoretical and practical strategies with ability to research using modern approaches in this field.								
Course Content	Introduction to data compression and coding theory, fundamental coding strategies (Block, Arithmetic, Huffman, Dictionary based coding), scalar and vector quantization, predictive coding, transformations, subband and wavelet transform based coding, overview of image, audio, video and computer graphics compression methods.								
Work Placement	N/A								
Planned Learning Activities and Teaching Methods	Explanation (Presentation), Discussion, Individual Study, Problem Solving								
Name of Lecturer(s)	Assoc. Prof. Korhan GÜNEL								

Assessment Methods and Criteria		
Method	Quantity	Percentage (%)
Midterm Examination	1	30
Final Examination	1	50
Assignment	1	20

Recommended or Required Reading	
1	David Salomon, Giovanni Motta, D. Bryant, Handbook of Data Compression, ISBN:978-1848829022, Springer, 5th edition, 2009.

Week	Weekly Detailed Course Contents	
1	Theoretical	Introduction to data compression and coding theory
	Preparation Work	Handbook of Data Compression, pp.21-43. should be read
2	Theoretical	Block coding
	Preparation Work	Handbook of Data Compression, Chapter 1 should be read
3	Theoretical	Arithmetic coding
	Preparation Work	Handbook of Data Compression, pp. 229-240 should be read
4	Theoretical	Huffman coding
	Preparation Work	Handbook of Data Compression, pp. 264-280 should be read
5	Theoretical	Dictionary based coding
	Preparation Work	Handbook of Data Compression , pp. 329-441 should be read
6	Theoretical	Scalar quantization
	Preparation Work	Handbook of Data Compression , pp. 49-54 should be read
7	Theoretical	Vector quantization
	Preparation Work	Handbook of Data Compression , pp. 443-603 should be read
8	Theoretical	Predictive coding
	Preparation Work	Handbook of Data Compression , pp. 635-730 should be read
9	Preparation Work	All subjects covered
	Intermediate Exam	MIDTERM EXAM
10	Theoretical	Transformation, sub-band coding and wavelet transform
	Preparation Work	Handbook of Data Compression , pp. 731-853 should be read
11	Theoretical	Presentations on compression strategies of image, audio, video and computer graphics.
	Preparation Work	Handbook of Data Compression, pp. 443-1085 should be read
12	Theoretical	Presentations on compression strategies of image, audio, video and computer graphics.
	Preparation Work	Handbook of Data Compression, pp. 443-1085 should be read
13	Theoretical	Presentations on compression strategies of image, audio, video and computer graphics.

13	Preparation Work	Handbook of Data Compression, pp. 443-1085 should be read
14	Theoretical	Implementations of common compression algorithms
	Preparation Work	All subjects covered
15	Theoretical	Implementations of common compression algorithms
	Preparation Work	All subjects covered
16	Preparation Work	All subjects covered
	Final Exam	FINAL EXAM

Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	3	3	84
Assignment	1	20	2	22
Midterm Examination	1	40	2	42
Final Examination	1	50	2	52
			Total Workload (Hours)	200
			[Total Workload (Hours) / 25*] = **ECTS**	8

**25 hour workload is accepted as 1 ECTS*

Learning Outcomes

1	To be able to comprehend the importance of some basic concepts of the information theory in data compression
2	To be able to design entropy based coding system
3	To be able to design dictionary based coding system
4	To be able to implement common compression algorithm
5	To be able to use mathematical concepts in solving certain types of problems

Programme Outcomes *(Mathematics Master)*

1	To be able to have an adequate theoretical and practical domain knowledge.
2	To be able to comprehend the interdisciplinary interaction associated with Mathematics.
3	To be able to use theoretical and practical domain knowledge gained in the field of Mathematics.
4	To be able to interpret knowledge from different disciplines integrating knowledge in the field of mathematics and produce new information.
5	To be able to define, analyse, model and to solve the problems by scientific methods in Mathematics.
6	To be able to conduct a math related specialistic study independently.
7	To be able to develop new strategic approaches to solve problems occurred in unforeseen and complex math-related applications by taking responsibility.
8	To be able to lead in situations that require solving problems related to the mathematics.
9	To be able to criticize his/her knowledge and skills acquired in the field mathematics.
10	To be able to transfer his/her ideas and suggestions for solutions to problems by supporting quantitative or qualitative data verbally and in writing.
11	To be able to communicate both orally and written in a foreign language.
12	To be able to use computer hardware and information technologies with software required by Mathematics.
13	To be able to contribute to the solution of the social, scientific, cultural and ethical problems related to the Mathematics, and being able to support the development of social, scientific, cultural and ethical values.
14	To be able to develop mathematics-related strategies, policies and operational plans, and to evaluate the results obtained within the framework of quality processes.
15	To be able to use his/her knowledge in the field of mathematics and practical problem-solving skills in interdisciplinary studies.

Contribution of Learning Outcomes to Programme Outcomes *1:Very Low, 2:Low, 3:Medium, 4:High, 5:Very High*

	L1	L2	L3	L4	L5
P1	3	4	4	4	4
P2	3	4	4		
P3	3	4	4	4	4
P4	3	4	4		
P5		4	4		
P7		4	4		4

P12	3			5	4
P15	4	4	4	3	4