



AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

Course Title		Digital Geometry							
Course Code		MTK636		Couse Level		Third Cycle (Doctorate Degree)			
ECTS Credit	7.5	Workload	189 (<i>Hours</i>)	Theory	3	Practice	0	Laboratory	0
Objectives of the Course		The purpose of this course is to present the students with the subjects in the course content at the graduate level							
Course Content		Grids, digitization, metrics, adjacency graphs, digital topology, topology of curves and surfaces, geometry of curves and surfaces, digital arc length, digital curvature, digital planes, digital convexity, transformation groups and symmetries							
Work Placement		N/A							
Planned Learning Activities and Teaching Methods				Explanation (Presentation), Discussion, Individual Study, Problem Solving					
Name of Lecturer(s)									

Assessment Methods and Criteria

Method	Quantity	Percentage (%)
Midterm Examination	1	20
Final Examination	1	60
Quiz	2	10
Assignment	1	10

Recommended or Required Reading

1	Digital Geometry: Geometric Methods for Digital Picture Analysis, Klette R. and Rosenfeld A., Elsevier, (2004)
2	Geometry of Digital Spaces, Herman G.T., Birkhauser, (1998)

Week	Weekly Detailed Course Contents	
1	Theoretical	Digitization
2	Theoretical	Metrics
3	Theoretical	Adjacency graphs
4	Theoretical	Digital topology
5	Theoretical	Topology of curves and surfaces
6	Theoretical	Geometry of curves and surfaces
7	Theoretical	Digital planes
8	Intermediate Exam	Midterm exam
9	Theoretical	Digital arc length
10	Theoretical	Digital curvature
11	Theoretical	Digital surface area
12	Theoretical	Digital convexity
13	Theoretical	Transformation groups and symmetries
14	Theoretical	Transformation groups and symmetries
15	Final Exam	Final exam

Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	3	3	84
Assignment	1	0	25	25
Quiz	2	12	1	26
Midterm Examination	1	20	2	22



Final Examination	1	30	2	32
Total Workload (Hours)				189
[Total Workload (Hours) / 25*] = ECTS				7.5
*25 hour workload is accepted as 1 ECTS				

Learning Outcomes

1	Expressing the concepts of digital plane and digital space
2	Defining the concepts of digital curve and digital surface
3	Defining the concepts of digital arc length, digital curvature and digital surface area
4	Expressing the concept of digital convexity
5	Expressing the concept of digital topology
6	Expressing the concept of symmetry group

Programme Outcomes (Mathematics Doctorate)

1	To be able to develop the current and advanced knowledge of mathematics domain to expertise level by an original idea or research, based on the level of its knowledge at the graduate level, and to be able to reach original definitions that will bring innovation to Mathematics.
2	To be able to comprehend the interdisciplinary interaction associated with Mathematics.
3	To be able to use and evaluate the new knowledge in the field of Mathematics with a systematic approach.
4	To be able to develop an idea, a method, a design or an application that will bring innovation to Mathematics, to use well known ideas, methods, designs or applications on a different research area, or to search, comprehend, design, adapt and apply an original subject matter.
5	To be able to criticize, analyze, synthesize and evaluate new and complex ideas.
6	To be able to have high-level skills in research methods related to studies on Mathematics.
7	To be able to expand the frontiers knowledge in the field of Mathematics via generating or interpreting an original study, or publishing at least a scientific paper in national/international refereed journals.
8	To be capable of leadership in the positions that require the analyses of problems related to the field of Mathematics.
9	To be able to defend his/her original ideas among the experts in the discussion of math related issues, and to be able to communicate effectively to show his/her competence in the field of Mathematics.
10	To be able to contribute to the solution of the social, scientific, cultural and ethical problems related to the Mathematics, and to be able to support the development of social, scientific, cultural and ethical values.
11	To be able to have both oral and written communication using a foreign language.

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

	L1	L2	L3	L4	L5	L6
P1	1	1	1	1	1	1
P2	2	2	2	2	2	2
P3	3	3	3	3	3	3
P4	2	2	2	2	2	2
P6	3	3	3	3	3	3
P7	1	1	1	1	1	1

