



AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

Course Title		Discrete Geometry							
Course Code		MTK635		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		Convex sets, Minkowski’s theorem, convex independent subsets, convex polytopes, intersection patterns of convex sets, geometric selection theorems, transversals, epsilon nets, higher dimensional polytopes, volume in high dimension							
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	Lectures on Discrete Geometry, Matousek, J., Springer, (2002)
2	Combinatorial Geometry, Pach J. and Agarwal P.K., John Wiley & Sons, Inc., (1995)

Week	Weekly Detailed Course Contents	
1	Theoretical	Convex sets
2	Theoretical	Minkowski's theorem
3	Theoretical	Convex independent subsets
4	Theoretical	Convex polytopes
5	Theoretical	Convex polytopes
6	Theoretical	Intersection patterns of convex sets
7	Theoretical	Geometric selection theorems
8	Intermediate Exam	Midterm exam
9	Theoretical	Transversals
10	Theoretical	Epsilon nets
11	Theoretical	Higher dimensional polytopes
12	Theoretical	Higher dimensional polytopes
13	Theoretical	Volume in high dimensions
14	Theoretical	Volume in high dimensions
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	Defining the concepts of convex set and convex independent sets
2	Expressing Minkowski's theorem and its applications
3	Expressing Erdős-Szekeres theorem and its applications
4	Expressing the concepts of convex and regular polytopes
5	Expressing Helly ve Tverberg theorems and their applications

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 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
P1	1	1	1	1	1
P2	2	2	2	2	2
P3	3	3	3	3	3
P4	2	2	2	2	2
P6	3	3	3	3	3
P7	2	2	2	2	2

