AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title	Amenable Banach Algebras								
Course Code	MTK613		Couse Level		Third Cycle (Doctorate Degree)				
ECTS Credit	7.5	Workload	188 *(Hours)*	Theory	3	Practice	0	Laboratory	0
Objectives of the Course	The purpose of this course is to introduce the concept of amenability in various algebraic structures and to establish the relation between them with the help of related theorems.								
Course Content	Properties and examples of amenable locally compact groups, amenable semigroups, definition of Banach algebra and examples, concept of module of Banach algebras, concept of derivation of Banach modules, Hochschild cohomology, definition of amenable Banach algebras, Johnson's theorem, virtual diagonal and approximate diagonal, examples of amenable Banach algebras, hereditary properties of amenable Banach algebras, various notions of amenability in Banach algebras.								
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	30
Final Examination	1	70

Recommended or Required Reading	
1	Banach Algebras and Automatic Continuity, H. Garth Dales, London Mathematical Society Monographs New Series, H. Garth Dales, 2000.
2	Lectures on Amenability, Runde, V., Springer-Verlag, 2002.

Week	Weekly Detailed Course Contents	
1	Theoretical	Definitions and examples of group, semigroup and locally compact group
2	Theoretical	Amenable locally compact groups
3	Theoretical	Properties and examples of amenable locally compact groups
4	Theoretical	Amenable semigroups
5	Theoretical	Definition of a Banach algebra and examples
6	Theoretical	Concept of module of Banach algebras
7	Theoretical	Concept of derivation of Banach modules
8	Theoretical	Hochschild cohomology
9	Intermediate Exam	Midterm Exam
10	Theoretical	Definition of amenable Banach algebras, Johnson's theorem
11	Theoretical	Virtual diagonal and approximate diagonal
12	Theoretical	Examples of amenable Banach algebras
13	Theoretical	Hereditary properties of amenable Banach algebras
14	Theoretical	Various notions of amenability in Banach algebras
15	Theoretical	Various notions of amenability in Banach algebras
16	Final Exam	Final Exam

Workload Calculation				
Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	3	3	84
Midterm Examination	1	40	2	42
Final Examination	1	60	2	62
			Total Workload (Hours)	188
			[Total Workload (Hours) / 25*] = **ECTS**	7.5
**25 hour workload is accepted as 1 ECTS*				

Learning Outcomes	
1	Ability to learn the properties of amenable locally compact groups.
2	Ability to understand the concept of derivation on Banach algebras.
3	Ability to understand the definition and basic theorems of amenable Banach algebras.
4	Ability to learn various notions of amenability in Banach algebras.
5	Ability to understand the concept of module on Banach algebras.

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	4	5	5	5	4
P2	4	4	5	5	5
P3	4	5	4	5	4
P4	3	5	5	5	5
P5	3	4	4	4	5
P6	4	4	5	5	4
P7	3	4	4	4	4
P9	3	3	4	4	4
P11	3	3	3	3	3