AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title	Banach Algebras								
Course Code	MTK517		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 aim to construct a base for future working on this topic by giving the basic definition and theorems of Banach algebras.								
Course Content	The definition and examples of Banach algebras, the spectrum of an element, the concept of an ideal, maximal ideal and homomorphism, quotient Banach algebras, Jacobson radical, tensor products, commutative Banach algebras and Gelfand Theory.								
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	50
Assignment	1	20

Recommended or Required Reading	
1	Complete Normed Algebras, F.F. Bonsall, J. Duncan, Springer-Verlag, New York, 1973.
2	Introduction to Banach algebras, operators, and harmonic analysis, H.G. Dales, P. Aiena, J. Eschmeier, K. Laursen, G.A. Willis, Cambridge Univ. Press, New York, 2003.
3	Banach Algebras and Automatic Continuity, H. Garth Dales, London Mathematical Society Monographs New Series, H. Garth Dales, 2000.

Week	Weekly Detailed Course Contents	
1	Theoretical	The definition and examples of Banach algebras
2	Theoretical	Regular and singular elements
3	Theoretical	Topological divisors of zero
4	Theoretical	The spectrum of an element, Gelfand-Mazur Theorem
5	Theoretical	The Spectral radius
6	Theoretical	Ideals and maximal ideals on Banach algebras
7	Theoretical	Quotient Banach algebras
8	Theoretical	Homomorphisms on Banach algebras
9	Intermediate Exam	Midterm Exam
10	Theoretical	Jacobson radical of a Banach algebra
11	Theoretical	Semi-simple Banach algebras
12	Theoretical	Tensor products of Banach algebras
13	Theoretical	Commutative Banach algebras and Gelfand Theory
14	Theoretical	Multiplicative linear functionals, Gelfand transform
15	Theoretical	Gelfand topology
16	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	Ability to understand the concept of Banach algebra, its basic properties and ability to recognize some examples of Banach algebras.
2	Ability to understand ideals, maximal ideals on Banach algebras and their basic properties.
3	Ability to understand the basic properties of Gelfand Theory on commutative Banach algebras.
4	Ability to understand the concept of homomorphisms on Banach algebras.
5	To be able to use tensor products of Banach algebras.

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	5	3	4
P2	4	4	5	4	4
P3	4	4	5	3	5
P4	3	4	5	5	4
P5	3	4	5	4	4
P6	4	4	5	4	3
P7		3	3	3	3
P9	3	3	3	3	3
P11	3	3	3	3	3
P13	4	4	4	4	4
P15	4	4	4	4	4