AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title	Functional Analysis								
Course Code	MTK612		Couse Level	Third Cycle (Doctorate Degree)					
ECTS Credit	10	Workload	249 *(Hours)*	Theory	3	Practice	0	Laboratory	0
Objectives of the Course	This course aims to acquaint students with the fundamental notions of Functional Analysis including Differentiation, Lebesgue Integral, Stieltjes Integral and its generalizations, Integral Equations and Linear transformations, Hilbert and Banach spaces, Completely contınuous symmetric transformations of Hilbert space, Bounded symmetric, Unitary, and normal transformations of Hilbert space, Unbounded linear transformations of Hilbert space.								
Course Content	Differentiation, Lebesgue Integral, Stieltjes Integral and its generalizations, Integral Equations and Linear transformations, Hilbert and Banach spaces, Completely contınuous symmetric transformations of Hilbert space, Bounded symmetric, Unitary, and normal transformations of Hilbert space, Unbounded linear transformations of Hilbert space.								
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	Functional Analysis, Frigyes Riesz, Bela Sz. –Nagy, 1990.

Week	Weekly Detailed Course Contents	
1	Theoretical	Differentiation
	Preparation Work	Relevant part of course book should be read
2	Theoretical	Differentiation
	Preparation Work	Relevant part of course book should be read
3	Theoretical	Lebesgue Integral
	Preparation Work	Relevant part of course book should be read
4	Theoretical	Stieltjes Integral and its generalizations
	Preparation Work	Relevant part of course book should be read
5	Theoretical	Integral Equations and Linear transformations
	Preparation Work	Relevant part of course book should be read
6	Theoretical	Integral Equations and Linear transformations
	Preparation Work	Relevant part of course book should be read
7	Theoretical	Hilbert and Banach spaces
	Preparation Work	Relevant part of course book should be read
8	Theoretical	Hilbert and Banach spaces
	Preparation Work	Relevant part of course book should be read
9	Preparation Work	Relevant part of course book should be read
10	Theoretical	Completely contınuous symmetric transformations of Hilbert space
	Preparation Work	Relevant part of course book should be read
11	Theoretical	Bounded symmetric, Unitary, and normal transformations of Hilbert space
	Preparation Work	Relevant part of course book should be read
12	Theoretical	Bounded symmetric, Unitary, and normal transformations of Hilbert space
	Preparation Work	Relevant part of course book should be read
13	Theoretical	Unbounded linear transformations of Hilbert space
	Preparation Work	Relevant part of course book should be read

14	Theoretical	Unbounded linear transformations of Hilbert space
	Preparation Work	Relevant part of course book should be read
15	Final Exam	Final Exam

Workload Calculation				
Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	4	3	98
Assignment	1	25	1	26
Reading	14	0	4	56
Midterm Examination	1	30	2	32
Final Examination	1	35	2	37
			Total Workload (Hours)	249
			[Total Workload (Hours) / 25*] = **ECTS**	10
**25 hour workload is accepted as 1 ECTS*				

Learning Outcomes	
1	Ability to comprehend differentiation in functional analysis
2	Ability to comprehend Lebesgue Integral in functional analysis
3	Ability to understand Hilbert and Banach spaces
4	Ability to understand some transformations
5	To be able to gain the skill of interpreting some interrelations among these concepts

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	4	4	4	4
P2	3	3	3	3	4
P3	5	5	5	5	4
P5	4	4	4	4	4