

Department Department of Mathematics			Academic Year 2022-2023	Date 01/12/2022	
Course Unit Code MATH4102	Course Unit Title Functional Analysis II		Semester/Year Spring/ 4	Number of ECTS Credits 6	
Language of Instruction	Turkish				
Type of Course Unit	Compulsory				
Prerequisites and co-requisites	-				
Address of course	-				
Local Credit	Theoretical	Practical	Laboratory	Presentation	Project
3	2	2	-	-	-
Name of Lecturers	Professor Yavuz ALTIN				
Assistants	-				

Course content	Linear Operators and Functions in Finite Dimensions, Norm Operator Spaces, Dual Spaces, Inner Product Spaces, Hilbert Spaces, Properties of Inner Product Spaces, Orthogonal Totals and Direct Sum, Orthonormal Sets and Series, Orthonormal Series and Sets Series, Total Orthonormal Sets and Series , Demonstration of Functions in Hilbert Spaces, Hilbert-Adjoint Operator, Self-Adjoint, Uniterate and Normal Operators, Hahn-Banach Theorem
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Weekly Detailed Course Contents	
Week	Topic
1	Linear operators and functions in finite dimension spaces
2	Norm operator spaces, dual spaces
3	Inner product spaces, Hilbert spaces
4	Properties of inner product spaces
5	Application
6	Orthogonal complement and direct sum
7	Orthonormal sets and sequences
8	Orthonormal sequences and sets sequences, total orthonormal sets and sequences
9	General application
10	Demonstration of functionals in Hilbert spaces
11	Hilbert-Adjoint operator
12	Self-Adjoint, uniter and normal operators
13	Hahn-Banach theorem
14	A brief evaluation of the course content and topics

Course Researches	Fonksiyel Analiz, Prof Dr. Öner ÇAKAR (Ervin Kreyszig'den Uyarlama) Fonksiyonel Analiz: Prof. Dr. Mustafa Bayraktar Fonksiyonel Analiz: Prof. Dr. Binali Musayev, Yrd. Doç. Dr. Murat Alp
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Assessment Methods and Criteria	In-Term studies	Quantity	Percentage (%)
	Mid-Term Exams	1	40
	Quizzes	-	-
	Assignments	-	-
	Projects	-	-
	Term assignment	-	-
	Laboratory	-	-
	Other	-	-
	Final exam	1	60
On Assessment Methods and	A grade of success; the relative evaluation system or evaluation of the instructor. In order to be taken into consideration in the courses in which the relative evaluation system and		

Criteria	teaching staff's discretion are applied, the final exam score of the student must be at least YSAS. Students who fall below this score are considered to fail directly. For the courses that cannot be evaluated with the relative evaluation system, the letter grades of the success grades are determined by the consent of the instructor teaching the table by 100 points by the Senate using the distribution of the final grade of success. A student who has received a grade AA, BA, BB, CB or CC grade is deemed to have completed that course. A student who has received one of the grade DC or DD grades is deemed to have fulfilled that course condition. In order for a student who takes DD and DC letters to be counted as successful, the GMS (General Mean Score) must be at least 2.00. A student who receives a graded FF grade is considered to have failed that course.
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Percentage of Course Category (%)	Mathematics and Basic Sciences	100
	Computer Sciences	0
	Programming Design	0
	Social sciences	0

Course Outcome	Student will learn inner product space, internalization of Hilbert space concepts, understanding of orthogonality, orthonormality and similar concepts besides various operators in these spaces
Aims of the course	Continue to give the main points of functional analysis which will be the basis of the post-graduate teaching
The way of processing course	Face to face

Relation of the course with program outcomes				
Learning outcomes		1	2	3
1	To have advanced theoretical and applied knowledge in a way to prioritize the scientific approach supported by textbooks containing up-to-date information in the field, application tools and other resources		X	
2	Adapting and transferring the knowledge gained in the field to secondary education			
3	Ability to independently carry out an advanced study in the field			
4	Be aware of the necessity of lifelong learning and continuously improve their professional knowledge and skills.			X
5	Using a foreign language at least at the European Language Portfolio B1 General Level, following the information in the field and being able to communicate with colleagues			
6	To be able to use information and communication technologies together with computer software at minimum advanced level of European computer license required by the field.			
7	Have the ability to make oral and written presentation in native language			
8	Having the ability to understand spoken English and use English at reading level			
9	To have the ability to assimilate mathematical concepts and understand the relationships between them, to recognize different aspects of the same concepts and relationships			X
10	To have the ability to define and formulate the relationships between items in non-mathematical disciplines in the language of mathematics.			
11	To have the ability to use mathematical knowledge in different problems			
12	Having the ability to develop computer programs using mathematical knowledge			
Contribution of the course: 1:No 2:Partially 3:Completely				

Preparer: Professor Yavuz ALTIN
Preparation date: 01/12/2022