Content

Course Code	Course Name	Semester	Theory	Practice	Lab	Credit	ECTS
MAT452	Introduction to Functional Analysis	7	3	0	0	3	5

Prerequisites	MAT201, MAT261, MAT262
Admission Requirements	MAT201, MAT261, MAT262

Language of Instruction	
Course Type	Elective
Course Level	Bachelor Degree
Objective	The objective of this course is to study the the basic tools for the functional anlysis without any refernce to measure theory
Content	Metric Spaces: Review Normed Spaces, Banach Spaces Inner Product Spaces, Hilbert Spaces 4 İmportant Theorems about Hilbert Spaces: Projection Theorem, Decomposition Theorem, Riesz Representation Theorem, Hahn-Banach Theorem
References	Introductory Functional Analysis and Applications, Erwin Kreyszig

Theory Topics

Week	Weekly Contents
1	Metric Spaces: Review
2	Further Examples of Metric Spaces: Sequences Spaces, Function Spaces
3	Completeness
4	Complete Metric Spaces
5	Normed Spaces, Banach Spaces
6	Compactness and Finite Dimension
7	Linear Operators
8	Bounded Operators
9	Linear Functionals
10	Normed Spaces of Operators and Dual Space
11	Inner Product Spaces, Hilbert Spaces
12	Orthoganal Complements and Orhonormal Sets and Sequences
13	4 İmportant Theorems about Hilbert Spaces: Projection Theorem, Decomposition Theorem, Riesz Representation Theorem, Hahn-Banach Theorem
14	4 İmportant Theorems about Hilbert Spaces: Projection Theorem, Decomposition Theorem, Riesz Representation Theorem, Hahn-Banach Theorem