



Kırıkkale University

GRADUATE SCHOOL OF NATURAL APPLIED SCIENCES
Mathematics (Master) (With Thesis)

MAT8056 Fixed Point Theory-2					
Semester	Course Unit Code	Course Unit Title	L+P	Credit	Number of ECTS Credits
2	MAT8056	Fixed Point Theory-2	3	3	7

Mode of Delivery:

Face to Face

Language of Instruction:

Türkisch

Level of Course Unit:

Master's Degree

Work Placement(s):

No

Department / Program:

Mathematics (Master) (With Thesis)

Type of Course Unit:

Elective

Objectives of the Course:

To introduce fixed point theory and applications.

Teaching Methods and Techniques:

Fixed point theorems for nonlinear contraction mappings

Prerequisites and co-requisites:**Course Coordinator:****Name of Lecturers:**

Prof. Dr. İshak ALTUN

Assistants:**Recommended or Required Reading****Resources**

R.P. Agarwal, D. O'Regan, D.R. Sahu, Fixed Point Theory for Lipschitzian-type Mappings with Applications, Springer, 2009.,S. Singh, B. Watson, P. Srivastava, Fixed Point R. P. Agarwal, M. Meehan, D. O'Regan, Fixed Point Theory and Application, Cambridge University Press, 2001.

Course Category

Mathematics and Basic Sciences	: 100	Education	:
Engineering	:	Science	:
Engineering Design	:	Health	:
Social Sciences	:	Field	:

Weekly Detailed Course Contents

Week	Topics	Study Materials	Materials
1	Comparison functions and nonlinear contractions		
2	Matkowski and Browder fixed point theorems		
3	Boyd-Wong fixed point theorem		
4	Generalized nonlinear contractions		
5	weak contractions		
6	Rakotch and Geraghty fixed point theorems		
7	alpha admissibility		
8	Midterm Exam		
9	Fixed point theorems on ordered metric spaces		
10	Introduction to Caristi fixed point theorem		
11	Caristi mappings and Caristi fixed point theorem		
12	Characterization of completeness via Caristi mappings		
13	Some generalizations of Caristi fixed point theorem		
14	Ekeland principle		
15	The relation between Caristi fixed point theorem and Ekeland principle		

Course Learning Outcomes**No Learning Outcomes**

C01 Students will have learned various nonlinear contractions.
C02 Students will have learned Caristi type fixed point theorem.

Program Learning Outcomes**No Learning Outcome**

P03 Define a problem and propose a solution for it, and to solve the problem, evaluate the results and apply them if it is necessary in his/her areas of expertise.
P08 Produce solution and to take responsibility and to develop new strategic approaches in situations which are not predicted in his/her areas of expertise.
P04 Transfer systematically the current developments, his/her studies to other people as verbal or written form confidently.
P09 Follow scientific, social, and ethical values and to teach and to control them in the step of data collection, evaluation and announcement of them.
P05 Develop new strategic approach and produce solutions by taking responsibility in unexpected and complicated situations in his/her area of practice.
P01 Evaluate the fundamental notions, theories and data with academic methods. Determining and analyzing the encountered problems and subjects, exchanging of ideas, improving suggestions prop
P10 Apply the digested knowledge and problem solving ability in the collaborations between different groups.
P02 Expand knowledge by scientific methods and use them with scientific, social and ethical responsibility.
P07 Have oral or written communication ability in one of the common foreign languages ("European Language Portfolio Global Scale", Level B2).
P06 Develop strategic, political and practice plans and evaluate the results by considering the quality process in his/her area of expertise.

Assessment Methods and Criteria		
In-Term Studies	Quantity	Percentage
Mid-terms	1	%40
Quizzes	0	%0
Assignment	0	%0
Attendance	0	%0
Practice	0	%0
Project	0	%0
Final examination	1	%60
Total		%100

ECTS Allocated Based on Student Workload			
Activities	Quantity	Duration	Total Work Load
Course Duration	16	3	48
Hours for off-the-c.r.stud	16	3	48
Assignments	3	15	45
Presentation	1	20	20
Mid-terms	1	20	20
Practice	0	0	0
Laboratory	0	0	0
Project	0	0	0
Final examination	1	30	30
Total Work Load			211
ECTS Credit of the Course			7

Contribution of Learning Outcomes to Programme Outcomes											
bbb											
	P01	P02	P03	P04	P05	P06	P07	P08	P09	P10	

All	5	5	4	4	4	3	3	2	4	5	
C01	5	5	5	5	5	5	5	5	5	5	
C02	5	5	5	5	5	5	5	5	5	5	

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