



Kırıkkale University

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

MAT8041 Linear Positive Operators Sequences-1					
Semester	Course Unit Code	Course Unit Title	L+P	Credit	Number of ECTS Credits
1	MAT8041	Linear Positive Operators Sequences-1	3	3	9

Mode of Delivery:

Face to Face

Language of Instruction:

Turkish

Level of Course Unit:

Master's Degree

Work Placement(s):

No

Department / Program:

Mathematics (Master) (With Thesis)

Type of Course Unit:

Required

Objectives of the Course:

To teach the approximation by the sequence of linear positive operators

Teaching Methods and Techniques:

The space of continuous functions, Linear Operators, Theorem of Korovkin, Bernstein Operators and its approximation properties, shape preserving properties, rate of convergence, approximation with unbounded functions.

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

Prof. Dr. Ali Aral

Assistants:**Recommended or Required Reading**

Resources 1. G. M. Phillips, Interpolation and approximation by polynomials, Springer-Verlag, 2003.,2. S. Gal, Shape preserving approximation by real and complex polynomials, Lecture, Drill and Practise, Problem Solving

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	Fundamental Concepts, Space of continuous functions, Linear operators		
2	Bounded Linear operators, Continuity and boundedness of operators,		
3	Weierstrass approximation theorems and different proofs,		
4	Convergence conditions of Linear positive operators, Korovkin's theorems		
5	Modulus of Continuity and its properties		
6	Forward difference operators, divided difference		
7	Bernstein operators and its approximation properties,		
8	Mid-term Exam		
9	Applications of Korovkin Theorem, Voronovskaya theorem, Convexity		
10	Star shaped, monotonicity and u-monotonicity		
11	Lipschitz type functions and its properties,		
12	Generalized Bernstein operators and its approximation properties,		
13	Rate of Convergence of Linear positive operators,		
14	Approximation by unbounded functions.		
15	Weighted Approach to Unbounded Ranges		

Course Learning Outcomes

No	Learning Outcomes
C01	1-Students learn fundamental Concepts, Space of continuous functions, Linear operators
C02	2- Students learn fundamental concepts, space of continuous functions, linear operators, Weierstrass approximation theorems and different proofs,
C03	3-Students learn modulus of continuity and its properties, forward difference operators, divided difference Bernstein operators and its approximation properties, applications of Korovkin theorem, V
C04	4- Students learn star shape, monotonicity and u-monotonicity Lipschitz type functions and its properties, generalized Bernstein operators and its approximation properties, rate of convergence of L

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 propp
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	4	20	80
Presentation	2	20	40
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			266
ECTS Credit of the Course			9

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

All	4	4	5	5	3	3	5	3	3	4	
C01	4	4	5	5	3	3	5	3	3	4	
C02	4	4	5	5	3	3	5	3	3	4	
C03	4	4	5	5	3	3	5	3	3	4	
C04	4	4	5	5	3	3	5	3	3	4	

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