AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title	Tauberian Theory and Its Applications								
Course Code	MTK618		Couse Level		Third Cycle (Doctorate Degree)				
ECTS Credit	7.5	Workload	188 *(Hours)*	Theory	3	Practice	0	Laboratory	0
Objectives of the Course	This course aims to acquaint students with the fundamental notions of Tauberian theory and its applications including the Laplace-Stieltjes transform, Abelian theorems for power series, Tauber's theorem, Fatou's theorem.								
Course Content	Laplace-Stieltjes transform, convergence and absolute convergence of the Laplace-Stieltjes transform, uniform convergence of the Laplace-Stieltjes transform, Abelian theorems for power series, Abelian theorems for the Laplace-Stieltjes transforms, Tauber's theorem, the remainder term in Tauber's theorem, Littlewood's theorem, the theorem of Hardy and Littlewood, Fatou's theorem, Korevaar's proof of Fatou's theorem, the Haryd-Littlewood theorem in the complex domain and Ikehara's theorem.								
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	Tauberian theory and its applications, A. G. Postnikov

Week	Weekly Detailed Course Contents	
1	Theoretical	Laplace-Stieltjes transform
	Preparation Work	Relevant part of course book should be read
2	Theoretical	Convergence and absolute convergence of the Laplace-Stieltjes transform
	Preparation Work	Relevant part of course book should be read
3	Theoretical	Uniform convergence of the Laplace-Stieltjes transform
	Preparation Work	Relevant part of course book should be read
4	Theoretical	Abelian theorems for power series
	Preparation Work	Relevant part of course book should be read
5	Theoretical	Abelian theorems for power series
	Preparation Work	Relevant part of course book should be read
6	Theoretical	Abelian theorems for the Laplace-Stieltjes transforms
	Preparation Work	Relevant part of course book should be read.
7	Theoretical	The remainder term in Tauber's theorem
	Preparation Work	Relevant part of course book should be read
8	Theoretical	Littlewood's theorem
	Preparation Work	Relevant part of course book should be read.
9	Preparation Work	Relevant part of course book should be read
10	Theoretical	Fatou's theorem
	Preparation Work	Relevant part of course book should be read
11	Theoretical	Proof of Fatou's theorem
	Preparation Work	Relevant part of course book should be read
12	Theoretical	the Haryd-Littlewood theorem in the complex domain
	Preparation Work	Relevant part of course book should be read.
13	Theoretical	Ikehara's theorem
	Preparation Work	Relevant part of course book should be read.
14	Theoretical	Ikehara's theorem

14	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	3	3	84
Assignment	1	12	1	13
Reading	14	0	3	42
Midterm Examination	1	20	2	22
Final Examination	1	25	2	27
			Total Workload (Hours)	188
			[Total Workload (Hours) / 25*] = **ECTS**	7.5

**25 hour workload is accepted as 1 ECTS*

Learning Outcomes

1	Ability to understand the Laplace-Stieltjes transform
2	Ability to comprehend Abelian theorems
3	Ability to comprehend Tauberian theorems
4	To be able to gain the skill of interpreting some interrelations among these concepts
5	To be able to use mathematical concepts in solving certain types of problems

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				4	4
P3	5	5	5	4	4
P4				4	4
P5	4	4	4	4	4
P6	3	3	3		
P7	2	2	2		