AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title		Mathematical Methods of Physics I							
Course Code		MTK573		Couse Level		Second Cycle (Master's Degree)			
ECTS Credit	7	Workload	175 *(Hours)*	Theory	3	Practice	0	Laboratory	0
Objectives of the Course		This course gives the fundamental concepts of generalized functions.							
Course Content		Test functions, Generalized functions, Local properties of generalized functions, Translations, rotations and other linear transformations on the independent variables of generalized functions, Regularization of divergent integrals, Convergence of generalized function sequences, Complex test functions and generalized functions, Differentiation and integration of generalized functions, Delta-convergent sequences, Some generalized functions , Canonical regularization.							
Work Placement		N/A							
Planned Learning Activities and Teaching Methods				Explanation (Presentation), Discussion, Individual Study, Problem Solving					
Name of Lecturer(s)		Prof. İnci EGE							

Assessment Methods and Criteria		
Method	Quantity	Percentage (%)
Midterm Examination	1	30
Final Examination	1	50
Assignment	1	20

Recommended or Required Reading	
1	I. M. Gelfand and Shilov, Generalized Functions, Vol. I, Academic Press, 1964.
2	R. Hoskins and J.S. Pinto, Ellis Horward, Chichester, Distributions, Ultradistributions and Other Generalized Functions, 1994.

Week	Weekly Detailed Course Contents	
1	Theoretical	Test functions
	Preparation Work	Related section in the handbook of Mathematical Methods of Physics I should be read
2	Theoretical	Generalized functions
	Preparation Work	Related section in the handbook of Mathematical Methods of Physics I should be read
3	Theoretical	Local properties of generalized functions
	Preparation Work	Related section in the handbook of Mathematical Methods of Physics I should be read
4	Theoretical	Translations, rotations andother linear transformations on the independent variables of generalized functions
	Preparation Work	Related section in the handbook of Mathematical Methods of Physics I should be read
5	Theoretical	Regularization of divergent integrals
	Preparation Work	Related section in the handbook of Mathematical Methods of Physics I should be read
6	Theoretical	Convergence of generalized function sequences
	Preparation Work	Related section in the handbook of Mathematical Methods of Physics I should be read
7	Theoretical	Complex test functions and generalized functions
	Preparation Work	Related section in the handbook of Mathematical Methods of Physics I should be read
8	Theoretical	Differentiation and integration of generalized functions
	Preparation Work	Related section in the handbook of Mathematical Methods of Physics I should be read
9	Preparation Work	All subjects covered
	Intermediate Exam	MIDTERM EXAM
10	Theoretical	Differentiation and integration of generalized functions
	Preparation Work	Related section in the handbook of Mathematical Methods of Physics I should be read
11	Theoretical	Differentiation and integration of generalized functions
	Preparation Work	Related section in the handbook of Mathematical Methods of Physics I should be read
12	Theoretical	Delta-convergent sequences
	Preparation Work	Related section in the handbook of Mathematical Methods of Physics I should be read
13	Theoretical	The generalized functions x^?, (x+i0)^?, (x-i0)^?
	Preparation Work	Related section in the handbook of Mathematical Methods of Physics I should be read

14	Theoretical	Canonical regularization
	Preparation Work	Related section in the handbook of Mathematical Methods of Physics I should be read
15	Theoretical	The generalized function r^?
	Preparation Work	Related section in the handbook of Mathematical Methods of Physics I should be read
16	Preparation Work	All subjects covered
	Final Exam	FINAL EXAM

Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	3	3	84
Assignment	1	10	2	12
Midterm Examination	1	32	2	34
Final Examination	1	43	2	45
			Total Workload (Hours)	175
			[Total Workload (Hours) / 25*] = **ECTS**	7

**25 hour workload is accepted as 1 ECTS*

Learning Outcomes

1	To be able to define generalized functions space
2	To be able to define convergence of the generalized functions
3	To be able to acquire some generalized functions
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 Master)*

1	To be able to have an adequate theoretical and practical domain knowledge.
2	To be able to comprehend the interdisciplinary interaction associated with Mathematics.
3	To be able to use theoretical and practical domain knowledge gained in the field of Mathematics.
4	To be able to interpret knowledge from different disciplines integrating knowledge in the field of mathematics and produce new information.
5	To be able to define, analyse, model and to solve the problems by scientific methods in Mathematics.
6	To be able to conduct a math related specialistic study independently.
7	To be able to develop new strategic approaches to solve problems occurred in unforeseen and complex math-related applications by taking responsibility.
8	To be able to lead in situations that require solving problems related to the mathematics.
9	To be able to criticize his/her knowledge and skills acquired in the field mathematics.
10	To be able to transfer his/her ideas and suggestions for solutions to problems by supporting quantitative or qualitative data verbally and in writing.
11	To be able to communicate both orally and written in a foreign language.
12	To be able to use computer hardware and information technologies with software required by Mathematics.
13	To be able to contribute to the solution of the social, scientific, cultural and ethical problems related to the Mathematics, and being able to support the development of social, scientific, cultural and ethical values.
14	To be able to develop mathematics-related strategies, policies and operational plans, and to evaluate the results obtained within the framework of quality processes.
15	To be able to use his/her knowledge in the field of mathematics and practical problem-solving skills in interdisciplinary studies.

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	3	3	3	3	3
P4	4	3	3	3	3
P7	3	2	2	2	2
P11	4	4	4	1	2
P15	3	3	3	2	2