AYDIN ADNAN MENDERES UNIVERSITY
COURSE INFORMATION FORM

Course Title		Special Fuctions						
Course Code		MTK614		Couse Level		Third Cycle (Doctorate Degree)		
ECTS Credit	7.5	Workload	193 *(Hours)*	Theory	3	Practice	0	Laboratory	0
Objectives of the Course		The aim of this course is to introduce special functions of mathematics.						
Course Content		The general approach to finding a solution to a differential equation (or a set of differential equations) is to begin the solution at the value of the independent variable for which the solution is equal to the initial values. One then proceeds in a step by step manner to change the independent variable and move across the required range.						
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	60
Assignment	1	10

Recommended or Required Reading

1	W. W. Bell, Special Functions for Scienlisls and Enginccrs, Dover I ublications, 2004. Larry C. Andrevvs, Ronold L. Phillips, Mathematical Techniques for Engineers and Scientists, Spie Press,2003.
2	Larry C. Andrews, Special Functions of Mathematics for Engineers, Spie Press, 1998.
3	Ian N. Sneddon, Fourier Transforms, Dover Pub., 1995.

Weekly Detailed Course Contents

Week		Weekly Detailed Course Contents
1	Theoretical	Series solutions of ordinary differential equations
2	Theoretical	Intergral Functions: Gamma function
3	Theoretical	Beta function, Error function
4	Theoretical	Exponential integrals, Elliptic integrals
5	Theoretical	Special functions: Bessel function
6	Theoretical	Legendre, Hermite, Laguerre
7	Theoretical	Chebyshev, Gegenbauer
8	Intermediate Exam	Midterm
9	Theoretical	Jacobi polinomials
10	Theoretical	Hipergcometric functions
11	Theoretical	Integral transforms
12	Theoretical	Laplace, Mellin, Hankel
13	Theoretical	Kontorovich-Lebedev, Mehler-Fock transforms
14	Theoretical	Fourier Transfors, z-transforms
15	Final Exam	Final exam

Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	3	3	84
Assignment	1	0	10	10
Project	1	0	20	20
Midterm Examination	1	30	2	32

Final Examination	1	45	2	47
		Total Workload (Hours)		193
		[Total Workload (Hours) / 25*] = **ECTS**		7.5

*25 hour workload is accepted as 1 ECTS

Learning Outcomes

1	To learn some Special Fuctions
2	To gain knowledge about Special Fuctions integral transforms and Fourier Series.
3	To be able to define some mathematical concepts which are essential in his/her field
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	3	4	4	4	4
P2	3	4	4	4	4
P3	3	4	4	4	4
P4	3	4	4	4	4
P5		4	4	4	4
P7		4			
P8	3				
P11	4	4			