

BOUNDARY-VALUE PROBLEMS

1	Course Title:	BOUNDARY-VALUE PROBLEMS	
2	Course Code:	MAT4062	
3	Type of Course:	Optional	
4	Level of Course:	First Cycle	
5	Year of Study:	4	
6	Semester:	8	
7	ECTS Credits Allocated:	6.00	
8	Theoretical (hour/week):	3.00	
9	Practice (hour/week):	0.00	
10	Laboratory (hour/week):	0	
11	Prerequisites:	None	
12	Language:	Turkish	
13	Mode of Delivery:	Face to face	
14	Course Coordinator:	Prof. Dr. SEZAYİ HIZLIYEL	
15	Course Lecturers:		
16	Contact information of the Course Coordinator:	hizliyel@uludag.edu.tr Tel:(0224)2941765 Uludağ Ün. Fen Ed. Fakültesi Matematik Bölümü Görükle Yerleşkesi 16059 Bursa-Türkiye	
17	Website:		
18	Objective of the Course:	The aim of this course is give methods to solve mathematical problems that arise in areas of application such as physics and engineering.	
19	Contribution of the Course to Professional Development:		
20	Learning Outcomes:		
		1	To understand boundary value and initial value problems that may arise in Engineering and physics
		2	Classifies almost linear second order partial differential equations
		3	knows Initial value and Cauchy problems defined for general hyperbolic equations and solves
		4	knows defined boundary value problems for elliptic equation and solves
		5	Knows the general properties of Green and Neumann functions
		6	Knows the initial and boundary value problems defined for the heat equation and solves
		7	Knows of separation of variables method and the heat, wave and Laplace equation applies
		8	
		9	
		10	
21	Course Content:		
		Course Content:	
Week	Theoretical	Practice	

1	The classification of the second order partial differential equation with two independent variables	
2	Homogeneous and inhomogeneous initial value problem for the wave equation	
3	The Cauchy problem for general hyperbolic equations, Green's identity	
4	Riemann's method, the symmetric of Riemann function	
5	the general solution to Laplace's equation, Green's identities, the fundamental solution, boundary value problems	
6	The solution of the Interior Dirichlet problem, some properties of Green's functions for the Green's function and Green's function for some regions	
7	Poisson's formula and the results	
8	Repeating courses and midterm exam	
9	The solution of the Interior Neumann problem, and Neumann functions	
10	Initial value problem for heat equation	
11	Initial and boundary value problem for heat equation	
12	the method of separation of variables , Fourier series expansion	
13	Application of heat and wave equation	
14	Application of the Laplace equation	
22	Textbooks, References and/or Other Materials:	Prof.Dr. Mehmet ÇAĞLIYAN, Okay Çelebi Kısmi Diferensiyel Denklemler, Vipaş Bursa 2002.
23	Assesment	
TERM LEARNING ACTIVITIES		
	NUMBER	WEIGHT
Midterm Exam	1	40.00
Quiz	0	0.00
Home work-project	0	0.00
Final Exam	1	60.00
Total	2	100.00
Contribution of Term (Year) Learning Activities to Success Grade		40.00
Contribution of Final Exam to Success Grade		60.00
Total		100.00
Measurement and Evaluation Techniques Used in the Course		
24	ECTS / WORK LOAD TABLE	

Activites	Number	Duration (hour)	Total Work Load (hour)
Theoretical	14	3.00	42.00
Practicals/Labs	0	0.00	0.00
Self study and preperation	14	3.00	42.00
Homeworks	4	10.00	40.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm exams	1	18.00	18.00
Others	1	14.00	14.00
Final Exams	1	20.00	20.00
Total Work Load			176.00
Total work load/ 30 hr			5.87
ECTS Credit of the Course			6.00

25	CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME QUALIFICATIONS															
	PQ1	PQ2	PQ3	PQ4	PQ5	PQ6	PQ7	PQ8	PQ9	PQ10	PQ11	PQ12	PQ13	PQ14	PQ15	PQ16
ÖK1	4	4	0	5	0	0	4	0	4	0	0	0	0	0	0	0
ÖK2	4	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0
ÖK3	4	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0
ÖK4	4	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0
ÖK5	4	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0
ÖK6	4	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0
ÖK7	4	4	0	4	0	0	0	0	0	0	0	0	0	0	0	0
LO: Learning Objectives PQ: Program Qualifications																
Contribution Level:	1 very low			2 low			3 Medium			4 High			5 Very High			