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 Ünv. 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 İnitial 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 differantial 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 Rieman 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	

22	Textbooks, References and/or Other Materials:	Prof.Dr. Mehmet ÇAĞLIYAN, Okay Çelebi Kışnıl Diferensiyel Denklemler Vipaş Bursa 2002		
Activites		Number	Duration (hour)	Total Work Load (hour)
Theoretical		14	3.00	42.00
Practicals/Labs		0	0.00	0.00
SEMESTER ACTIVITIES	**NUMBER**	**WEIGHT**		
Laboratory	1	14	3.00	42.00
Homeworks		4	10.00	40.00
Midterm Exam	1	40.00		
Projects		0	0.00	0.00
Quiz	0	0.00		
Field Studies		0	0.00	0.00
Home work project	0	0.00		
Midterm exams	1	1	18.00	18.00
Final Exam	1	60.00		
Others		1	14.00	14.00
Total	2	100.00		
Final Exams		1	20.00	20.00
Contribution of Term (Year) Learning Activities to		40.00		
Total Work Load				176.00
Total work load/ 30 hr				5.87
Contribution of Final Exam to Success Grade		60.00		
ECTS Credit of the Course				6.00
Total		100.00		

Measurement and Evaluation Techniques Used in the Course	
24	**ECTS / WORK LOAD TABLE**

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**