MATH 321 PARTIAL DIFFERENTIAL EQUATIONS
FALL 2009

Lectures: Monday 10:00-11:00 am (DMF 101) and Tuesday 9:00-11:00 am (DMF 101)
Instructor: Hüsnü A. Erbay
Office: AMF 110
Office Hours: Monday 15:00-16:00 am and Tuesday 15:00-16:00 am or make an appointment by e-mail.
Office Phone: 0(216) 7121460 ext. 7115
E-mail: erbay@isikun.edu.tr
Website: http://math.isikun.edu.tr/erbay/

Textbook: "Partial Differential Equations-An Introduction", by W.A. Strauss, Published by John Wiley & Sons, Inc., 1992.
Suggested Reading: "A First Course in Partial Differential Equations with Complex Variables and Transform Methods", by H.F. Weinberger, Published by Dover Publications, Inc., 1995.
"Partial Differential Equations-An Introduction", by E.C. Young, Published by Allyn&Bacon, 1972.

Course Description: This is an introductory Partial Differential Equations course for students in mathematics. The focus will be on the analytical solution techniques for second-order linear partial differential equations such as wave equation, diffusion equation and Laplace equation. At the end of the semester, students should be able to understand and exploit the properties of solutions of these three important partial differential equations. The course will cover most sections of the first seven chapters of the book.
Prerequisites: A solid knowledge of multivariable calculus, linear algebra and ordinary differential equations.
Course Evaluation: There will be a course evaluation on the week 21-26 December 2009.
Attendance: Students are expected to attend all class meetings. Attendance will constitute a part of their grades (10% of the total grade).
Example Sheets: There will be no homework assignments through the semester. Some practice problems taken from the questions in the textbook will be announced on the course website through the semester. These will not be collected. The answers to some questions are at the back of the textbook. Keep in mind that understanding and solving these questions will have a significant impact on your final grade. Also, some problems from past exams I have given previous semesters will be posted on the course homepage.
Exams: There will be seven midterm exams and one final exam. Exams are closed notes and closed book. The midterms are approximately 50 minutes long. Make-ups will not be given for the midterm exams. The lowest of the seven midterm scores will be dropped. The midterms are worth 60% of the total grade. The midterm exams will be given in weeks 4, 6, 8, 11, 12, 13 and 14. The actual date of each exam will be announced at least two weeks ahead.
Grading: 10% Attendance, 10% Each of the six midterms, 30% Final exam.

Week	Dates	Sections/Topics Covered	Exam
1	Sep.28, 29	Sec. 1.1 What is a PDE ? Sec. 1.2 First-Order Linear Equations	
2	Oct. 05, 06	Sec. 1.3 Flows, Vibrations, and Diffusions	
3	Oct. 12, 13	Sec. 1.4 Initial and Boundary Conditions Sec. 1.5 Well-Posed Problems Sec. 1.6 Types of Second-Order Equations	
4	Oct. 19, 20	Sec. 2.1 The Wave Equation Sec. 2.2. Causality and Energy	Midterm 1
5	Oct. 26, 27	Sec. 2.3 The Diffusion Equation Sec. 2.4 Diffusion on the Whole Line	
6	Nov. 02, 03	Sec. 2.4 Diffusion on the Whole Line Sec. 2.5 Comparison of Waves and Diffusions	Midterm 2
7	Nov. 09, 10	Sec. 3.3. Diffusion with a Source Sec. 3.4 Waves with a Source	
8	Nov. 16, 17	Sec. 4.1 Seperation of Variables, the Dirichlet Condition	Midterm 3
9	Nov. 23, 24	Sec. 4.2 The Neumann Condition Sec. 4.3 The Robin Condition	
10	Dec. 01	Sec. 5.1 The Coefficients (of Fourier Series)	
11	Dec. 07, 08	Sec. 5.2 Even, Odd, Periodic, and Complex Functions Sec. 5.3 Orthogonality and General Fourier Series Sec. 5.4 Completeness Sec. 5.6 Inhomogeneous Boundary Conditions	Midterm 4
12	Dec. 14, 15	Sec. 6.1 Laplace's Equation Sec. 6.2 Rectangles and Cubes	Midterm 5
13	Dec. 21, 22	Sec. 6.3 Poisson's Formula Sec. 6.4 Circles, Wedges and Annuli	Midterm 6
14	Dec. 28, 29	Sec. 7.1 Green's First Identity Sec. 7.2 Green's Second Identity Sec. 7.3 Green's Functions Sec. 7.4 Half-Space and Sphere	Midterm 7