



Welcome to *K.T.D.D.* aka *Partial Differential Equations*.

Course Website

x.co/mat372



Kitap/Suggested Text(s)

We will be using a free ebook for this course:

- *Partial Differential Equations* by Beny Neta.
(<http://faculty.nps.edu/bneta/pde.pdf>).

Don't print the whole book; you will only need chapters 1-5 and chapter 9.

Giriş/Introduction

Many problems in physics, biology and engineering depend on more than one variable. So instead of using Ordinary Differential Equations (ODEs) to model them, we must use Partial Differential Equations (PDEs).

The 3 most famous PDEs are the Heat Equation

$$u_t = \alpha u_{xx}, \tag{1}$$

the Wave Equation

$$u_{tt} = c^2 u_{xx} \tag{2}$$

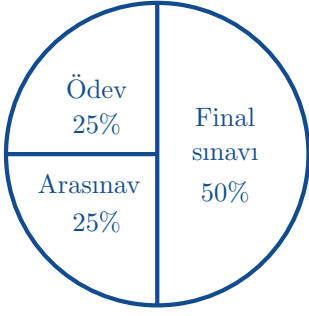
and Laplace's Equation

$$u_{xx} + u_{yy} + u_{zz} = 0. \tag{3}$$

We will start the course by deriving these three equations. Later in the course, we will see how to solve these and some other partial differential equations.

Içerik/Contents

“Mathematics is not a spectator sport.”



During the course, there will be homework problems for you to study. Please remember that your answers to the homework problems must be your own work. Plagiarism is not acceptable: **If you copy another student's homework, or if you allow someone to copy your homework, then you will both receive a mark of zero!** *İntihal bir suçtur: Başka bir öğrencinin ödevinden kopya çekerseniz, ya da sizin ödevinizden kopya çekmesine izin verirsiniz, her ikiniz de sıfır alacaksınız!*

There will be only one mid-term exam.

For a course with 3 hours of lectures per week; I expect you to spend atleast 3 hours every week, studying outside of class. At a minimum, you should be reading the textbook, and attempting the exercise questions in there (not just the ones I set for homework).

If you miss a lecture; I expect you to copy your friends' notes or read the textbook, to catch up.

Not/Grades

I will give a pass (grade DD) for a mark of 40/100 or higher, grade DC for ≥ 46 , grade CC for ≥ 52 , grade CB for ≥ 58 , grade BB for ≥ 64 , grade BA for ≥ 70 , and grade AA for ≥ 76 .

Dersler/Lectures

- Çarşamba 11:00–13:00, oda D405
- Perşembe 11:00–12:00, oda D405

Ofis Saati/Office Hours

If you have any questions, or would like any extra hints for the homework, you can find me in my office at the following time:

- Perşembe/Thursday 12:00-13:00.

Alternately, you can email your questions to me at neil.course@okan.edu.tr

Ders programı/Syllabus

- Derivation of the Heat Equation, the Wave Equation and Laplace's Equation,
- Classification of PDEs, Canonical Forms,
- The Method of Characteristics, Fan-like Characteristics, Shock Waves, the Wave Equation,
- Separation of Variables, the Heat Equation,
- Fourier Series,
- Fourier Transforms.