



Welcome to *Fonksiyonel Analiz II* aka *Functional Analysis II*.

Course Website

www.neilcourse.co.uk/mat462.html



Kitap/Suggested Text(s)

We will continue to use the free ebook:

- *Topics in Real and Functional Analysis* by Gerald Teschl
(www.mat.univie.ac.at/~gerald/ftp/book-fa).

Giriş/Introduction

In this course, we will be extending our knowledge of *Functional* or *Linear Analysis*.

We will continue to study Banach spaces and Hilbert spaces, while introducing concepts such as *weak convergence*

$$x_n \rightharpoonup x$$

and weak limits

$$\text{w-lim}_{n \rightarrow \infty} x_n = x.$$

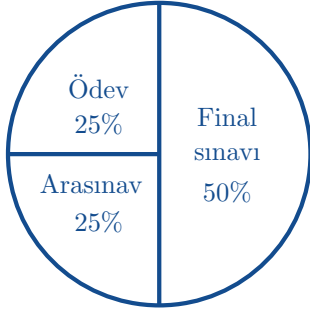
I will expect you to be familiar with the main definitions from MAT461 Fonksiyonel Analiz:

- | | | |
|-----------------|-----------------------|-------------------------|
| • norm | • inner product space | • orthogonal complement |
| • normed space | • Hilbert space | • adjoint operator |
| • complete | • stronger (norm) | • non-negative operator |
| • compact | • operator | • compact operator |
| • Banach space | • bounded operator | • self-adjoint operator |
| • separable | • functional | • symmetrical operator |
| • orthogonal | • orthonormal basis | • eigenvalue |
| • inner product | • unitary equivalent | • eigenvector |

as well as the main results (Cauchy-Schwarz, Riesz, etc.).

İçerik/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 6 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

- Pazartesi 14:00–16:00
- Çarşamba 10:00–11:00

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:

- Pazartesi/Monday 16:00–17:00;

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

Ders programı/Syllabus

- Compact Operators
- The Baire Category Theorem,
- The Hahn-Banach Theorem,
- Weak Convergence,
- Canonical Forms of Compact Operators,
- Hilbert-Schmidt Operators,
- Fredholm Theory,
- Weak Derivatives,
- Sobolev Spaces (time permitting).