MATH 497
HILBERT SPACE TECHNIQUES, Fall 2019

Schedule: Mon 8:40-9:30, Wed 15:40-17:30 at M102,

Instructor: Özcan Yazıcı

Office Hours:TBA, M127

Course Description:
Inner product spaces, normed spaces, Hilbert and Banach Spaces, Orthogonal expansions, Fourier Series, Dual spaces, The Riesz-Fréchet theorem, Linear operators, Spectrum, Compact operators, The spectral theorem for compact Hermitian operators.

Textbook An introduction to Hilbert space by Nicholas Young, Cambridge University Press 1988. We will cover most of the chapters from 1 to 8.

Other reference books:

Fonsiyonel Analizin Yöntemleri, Tosun Terzioğlu

Introduction to Functional Analysis, E.Kreyszig

Exams and Grading: 2 Midterms 30% each, final exam 40%

Attendance Policy: Students must attend to the lectures regularly.

Homework: Homework assignments will not be collected. Students are encouraged to work on the assigned problems regularly. At least 30% of the midterm questions will be from the problems in the book which are listed below.

Suggested homework problems from the book of N.Young:

Ch1: 1.1, 1.2, 1.4, 1.6, 1.7, 1.8, 1.9, 1.11

Ch2: 2.1, 2.3, 2.4, 2.5, 2.6, 2.7, 2.9, 2.12, 2.13.

Ch3: 3.1, 3.2, 3.3, 3.6, 3.9,3.10

Ch4: 4.1, 4.2, 4.4, 4.6, 4.7, 4.9, 4.10, 4.11,4.14, 4.15, 4.16, 4.18, 4.19

Ch5: 5.1 (a,b), 5.3, 5.4

Ch6: 6.1, 6.3, 6.5, 6.6, 6.7, 6.8, 6.9

Ch7: 7.1, 7.4, 7.7, 7.8, 7.9, 7.12, 7.14, 7.16, 7.17, 7.19, 7.20, 7.22, 7.25, 7.26, 7.30, 7.31, 7.32, 7.34, 7.35, 7.36, 7.37, 7.40

Ch8: 8.1, 8.3, 8.4, 8.8, 8.11, 8.14, 8.16.