FUNCTIONAL ANALYSIS – MATH 535 – TERM 221

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Office Hours **Face-Face:**
Sunday and Tuesday 05:15-06:00PM
Online: via zoom (by **appointment**)

Textbook:

Functional Analysis, Erdogan Suhubi, Kluwer Academic Publishers, (2003)

Description:

- Normed linear spaces,
- Banach spaces,
- Hilbert spaces,
- Banach Algebras (definitions, examples, geometric properties),
- Bounded linear operators,
- Convex sets,
- Linear functionals,
- Duality,
- Reflexive spaces,
- weak topology and weak convergence,
- Banach fixed point theorem,
- Hahn-Banach theorem,
- Uniform boundedness principle,
- Open mapping theorem
- Closed graph theorem,
- Representation of functionals on Hilbert spaces (Riesz Representation Theorem).

Grading Policy:

- 15%: Term Paper
- 50%: Two Major Exams: first 25%, second 25%
- 35%: Final comprehensive exam

Evaluation:

Final grade is according to the scale

GRADE	RANGE
A+	[90%, 100%]
A	[80%, 90%)
B+	[75%, 80%)
B	[70%, 75%)
C+	[65%, 70%)
C	[55%, 65%)
D+	[50%, 55%)
D	[45%, 50%)
F	[0%, 45%)

Class Attendance

Graduate students are subject to the same rules governing class attendance, the performance of assigned tasks, and course examinations as undergraduate students at the University. Regular and punctual attendance is both a University regulation and a mark of courtesy to the instructor. A DN grade will be awarded to any student who accumulates more than 9 unexcused absences or more than 15 excused and unexcused absences of lectures and labs.

Missing Exams

In case a student misses an exam (Exam I, Exam II, or the Final Exam) for a legitimate reason (such as medical emergencies), he/she must bring an official excuse from Students Affairs/Graduate Studies. Otherwise, he/she will get zero in the missed exam.

Course Schedule:

Week	Topic	Section	HW
1	LINEAR VECTOR SPACES	2.2, 2.3, 2.4	2.5, 2.6, 2.8, 2.9, 2.12, 2.18, 2.26, 2.29, 2.32, 2.34, 2.38, 2.43, 2.44, 2.45, 2.46, 2.47, 2.52, 2.53
2		2.5, 2.6, 2.7 & 2.10	
3	METRIC SPACES	5.2, 5.3, 5.4	5.3, 5.5, 5.8, 5.11, 5.21, 5.25, 5.28, 5.32, 5.34, 5.37, 5.38, 5.39, 5.42, 5.50, 5.52
4		5.5, 5.6 & 5.7	
5	NORM ED SPACES	6.2, 6.3	**EXAM I – Week 6**
6		6.4	
7		6.5	6.1, 6.3, 6.5, 6.7, 6.10, 6.14, 6.15, 6.17, 6.19, 6.21, 6.24, 6.25, 6.27, 6.36,6.39, 6.40, 6.41, 6.42, 6.44, 6.46, 6.47, 6.53, 6.57, 6.64 & 6.67
8		6.6	
9		6.7, 6.8	
10		6.9, 6.10	
11		6.13 & 6.14	
12	INNER PRODUCT SPACES	7.2	**EXAM II – Week 12**
13		7.3, 7.4	7.2, 7.8, 7.11, 7.17, 7.35 & 7.39
14		7.5	
15		7.6	

FINAL EXAM – See Registrar website