

CSE386M/EM386M FUNCTIONAL ANALYSIS IN THEORETICAL MECHANICS
Fall 25, # 69995, # 16120 MW 3:00 - 4:30, ETC 2.132

Text: J. T. Oden, L. Demkowicz, *Applied Functional Analysis*, CRC Press, 2018 (third edition).

Week	Topic	Chapter
Aug. 25-Aug.29	Preliminaries: set theory, logic, relations	1.1-1.10
Sep. 3 -Sep. 5	Functions, cardinality of sets	1.11-1.14
Sep. 8 -Sep. 12	Elementary topology in \mathbb{R}^n	1.17-1.20
Sep. 15 -Sep. 19	Vector spaces	2.1-2.4
Sep. 22 -Sep. 26	Linear transformations	2.5-2.9
Sep. 29 -Oct. 3	Algebraic duals, transpose of an operator	2.10-2.13
Oct. 6 -Oct. 10	Inner product, abstract measure	2.14, 3.1
Oct. 13 -Oct. 17	Lebesgue measure	3.2-3.3
Oct. 20 -Oct. 24	Lebesgue integral	3.4-3.5
Oct. 27 -Oct. 31	Fubini's Thm, L^p -spaces	3.6-3.9
Nov. 3 -Nov. 7	General abstract topological spaces	4.1-4.2
Nov. 10-Nov. 14	Compactness	4.3-4.5
Nov. 17-Nov. 21	Metric spaces, Bolzano-Weierstrass Thm	4.6-4.9
Dec. 1 -Dec. 5	Banach Fixed Point Thm	4.10
Dec. 8	Banach Fixed Point Thm - cont.	4.10

Homework: Homework assignments will be posted in Canvas after the lectures. The homework will be collected in class during the FIRST lecture in a week (most of time Monday).

Exams: There will be three (closed book) exams held during evening hours (5:00-8:00 p.m.) according to the following schedule:

- Exam1 (through Section 1.20) Tue., Sep.23, POB 6.304.
- Exam2 (through Section 3.5) Tue., Oct.28, POB 6.304.
- Exam3 (through Section 4.9) Tue., Dec. 2, POB 6.304.

Final Exam: Comprehensive, mandatory and closed book, given during the official scheduled time, place TBA.

Discussion session (obligatory): Fri, 3:30-5:00, POB 6.304.

Instructor: Dr. Leszek Demkowicz, POB 6.326, Office hours: Mon, Wed, 4:30-5:30 (after the class), Fri, after the discussion session.

TA: Anastasia Sachinidou *anast.sachi@utmail.utexas.edu*, office hours TBD.

Final Grade: Is based upon the final score.

Final score range	grade
85 - 100	A with recommendation letter
75 - 85	A
72 - 74	A-
68 - 71	B+
65 - 67	B
62 - 64	B-
58 - 61	C+
55 - 57	C
52 - 54	C-
48 - 51	D+
45 - 47	D
42 - 44	D-
00 - 41	F

The final score is a weighted average of the homework score, three mid-term exams and the final exam, with the following weights:

Homework	- 15 %
Exams	- 15,20,20 %
Final	- 30 %