

CSE 386C METHODS OF APPLIED MATHEMATICS
Fall 2019, # 64725, TTh 12:30 - 14:00, RLM 5.112

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

Complementary reading: T. Arbogast and J.L. Bona, *Functional Analysis for the Applied Mathematician*, preprint.

TA: TBD

Week	Topic	Chapter
Aug 28 -Aug 30	Topological Vector Spaces	5.1-5.3
Sep 3 - Sep 6	TVSs - cont.	5.1-5.3
Sep 9 -Sep 13	Hahn-Banach Extension Thm	5.4-5.5
Sep 16 -Sep 20	Bounded Operators on Normed Spaces	5.6-5.7
Sep 23 -Sep 27	Banach-Steinhaus and Open Map Thms	5.8-5.9
Sep 30 -Oct 4	Closed Operators and Closed Graph Thm	5.10-5.11
Oct 7 -Oct 11	Topological Duals, Reflexive Spaces	5.12-13
Oct 14 -Oct 18	Weak Topologies and Compact Operators	5.14-15
Oct 21 -Oct 25	Distributions and Sobolev Spaces	TBD
Oct 28 -Nov 1	Topological Transpose and Closed Range Thm	5.16-5.17
Nov 4 -Nov 8	Closed Range Thm for Closed Operators	5.18-5.19
Nov 11 -Nov 15	Hilbert Spaces - Fundamentals	6.1-6.3
Nov 18 -Nov 22	Riesz representation Thm, Adjoints, Variational Problems	6.4-6.7
Nov 25 -Nov 27	Elementary Spectral Theory	6.8-6.10
Dec 2 -Dec 6	Spectral Theory for Self-Adjoint Operators	6.11

Discussion Session: ACES 6.304, Time TBD.

Homework: Homework assignments will be made in class. The problems assigned in the class will not be collected. Instead, we will begin each discussion session with a quiz for which one of the homework problems will be selected.

Exams: There will be three (closed book) exams held in ACES 6.304, during evening hours (5:00-8:00 p.m.) according to the following schedule:

- Exam1 (through Section 5.7) Mon., Sep 30,
- Exam2 (through Section 5.17) Mon., Nov 4,
- Exam3 (through Section 6.7) Mon., Dec 2,

Final Exam: Comprehensive, mandatory, closed book, at officially scheduled time.

Instructor: Dr. Leszek Demkowicz, ACES 6.326, Office hours: Tue, Thu, 2:00-3:15 PM (after the class).

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 test score, three mid-term exams and the final exam, with the following weights:

Tests (homework)	- 10 %
Exams	- 20 % each
Final	- 30 %