3283W (Sequences, Series, and Foundations) Syllabus – Spring 2018

Rough Outline: We will cover most of chapters 1–5 and chapter 8 in the textbook (*Analysis With an Introduction to Proof*, by Steven Lay). We will cover some material from chapter 6 since that includes material on Taylor Series - a particularly important place where the theory of series is applied. In the syllabus below, we list in parentheses the textbook reading that students should complete **in advance** of class. Students will also have access to lecture notes from class. **The class lecture notes are supplied with the expressed understanding that students will rewrite them in their own handwriting, adding or taking away words according to the student's own way of thinking about the material and using the student's own lecture notes as input too. This careful rewriting of lecture notes is an important part of picking up the new material in the course We really, really want to emphasize the value of rewriting on your own the lecture notes (either yours or the instructor's) for each class.**

This syllabus is subject to change, since our pace might change. Key section dates for quizzes (Tuesdays in section) and exams (Thursdays in section) are listed in the syllabus below.

1.	W	Jan 16	Outline of course, logical statements and truth tables (Section 1.1)
2.	F	Jan 18	Logical quantifiers (Section 1.2)
3.	M	Jan 22	Proof strategies I (Sections 1.3, 1.4)
4.	W	Jan 24	Proof strategies II (Section 1.3, 1.4)
5.	F	Jan 26	Basic set operations (Section 2.1)
6.	M	Jan 29	Operations and relations on sets (Section 2.2.)
	T	Jan 30	Quiz I
7.	W	Jan 31	Equivalence relations (Section 2.2)
8.	F	Feb 2	Introduction to functions (Section 2.3)
9.	M	Feb 5	Functions on sets (Section 2.3)
10.	W	Feb 7	Composition and inverse of functions (Section 2.3)
	Th	Feb 8	EXAM I (covering Sections 1.1–2.2)
11.	F	Feb 9	Cardinality (Section 2.4 up to p. 89)
12.	M	Feb 12	Axioms for Set Theory (Section 2.5)
	T	Feb 13	Quiz 2
13.	W	Feb. 14	Natural numbers and induction (Section 3.1)
14.	F	Feb. 16	Examples of induction arguments (Section 3.1)
15.	M	Feb. 19	Ordered fields (Section 3.2 to p. 118)
	T	Feb. 20	Quiz 3
16.	W	Feb. 21	Absolute values, bounds, suprema (Sect 3.2 pp. 118-119, Sect 3.3 up to p. 126)
17.	F	Feb. 23	Completeness axiom and Archimedean property (Section 3.3 pp. 126–131)
18.	M	Feb. 26	Topology of R: neighborhoods, open and closed sets (Section 3.4, pp. 134–137)
	T	Feb 27	Quiz 4
19.	W	Feb 28	Accumulation points (Section 3.4, pp. 137–139)

20.	F	March 2	Compact Sets (Section 3.5, pp. 144–146)
21.	M	March 5	Bolzano-Weierstrass theorem (Section 3.5, pp. 147–148)
22.	W	March 7	REVIEW
	Th	March 8	EXAM II (covering Sections 2.3–2.5 and 3.1–3.4)
23.	F	March. 9	Discussion of Exam and review of sections 3.5 - 3.6
	M-F	9/12- 9/16	**SPRING BREAK**
24.	M	March 19	Convergence of a sequence (Section 4.1)
	T	March 20	Quiz 5
25.	W	March 21	Computing limits and limit theorems (Sections 4.1 and 4.2)
26.	F	March 23	Infinite limits (Section 4.2)
27.	M	March 26	Monotone convergence theorem (Section 4.3 up to p. 180)
	T	March 27	Quiz 6
28.	W	March 28	Cauchy sequences (Section 4.3, pp. 180–184)
29.	F	March 30	Subsequences (Section 4.4)
30.	M	April 2	Subsequences, continued. (Section 4.4)
	T	April 3	Quiz 7
31.	W	April 4	Convergence of Infinite Series (Section 8.1)
32.	F	April 6	Convergence Tests (Section 8.2)
33.	M	April 9	Power Series (Section 8.3)
	T	April 10	Quiz 8
34.	W	April 11	Limits of Functions (Section 5.1)
35.	F	April 13	Continuous functions (Section 5.2)
36	M	April 16	Review for exam
37.	W	April 18	Intermediate Value Theorem (Section 5.3)
	Th	April 19	EXAM III (covers Section 3.5, Chapter 4, and Chapter 8)
38.	F	April 20	Compact sets and continuity (Section 5.3)
39.	M	April 23	The derivative (Section 6.1)
	T	April 24	Quiz 9
39.	W	April 25	The Mean Value Theorem (Section 6.2)
40.	F	April 27	L'Hospital's Rule
41.	M	April 30	Taylor's Theorem (Section 6.4)
	T	May 1	Quiz 10
42.	W	May 2	Taylor's Theorem (Section 6.4)
42.	F	May 4	REVIEW
	Th	May 10	**Final Exam, 1:30 - 3:30 Location TBD**