Math 136 **Real Analysis II** **Spring 2020**
Prof. L. Tu **Schedule**

HW	Date	Read	Topics	HW due
1	1/15	3.7	Limits of a function at a point	
		4.1	Derivatives of real-valued functions	
		4.2	Chain rule in one variable (pp. 99–100 only)	
	1/20		**Martin Luther King Day: No Classes**	
	1/22	4.3	(Tufts Monday) The mean value theorem in one variable	1/29
2	1/27	13.1, 13.2	Limits of functions of several variables, partial derivatives	
	1/29	13.3	The mean value theorem and directional derivatives	2/5
3	2/3	14.1	First-order approximation for a function, tangent planes, affine functions	
		15.2	First-order approximation for a mapping, derivative matrix	
	2/5	15.3	The chain rule in several variables	2/12
4	2/10	16.1, 17.1	The inverse function theorem, Dini's theorem	
	2/12	17.2	The implicit function theorem	2/20
	2/17		**Presidents' Day: No Classes**	
5	2/19	6.1	Darboux sums, upper and lower integrals	
		6.2	The Archimedes–Riemann theorem	
	2/20	6.3	(Tufts Monday) Additivity, linearity	
			Exam 1: Monday, February 24, 2020, noon–1:20 p.m.	
6	2/24	6.3, 6.4	Monotonicity, continuity, and integrability	
		6.6	Fundamental theorem of calculus (FTC) II: derivative of an integral	
	2/26	6.5	FTC I: integral of a derivative	
		7.3	Darboux and Riemann sums	3/4
7	3/2	18.1	Integration in several variables	
	3/4	18.1	Darboux sum convergence theorem in several variables	
		18.2	Continuity and integrability	3/11
8	3/9	18.3	Jordan domains	
	3/11	18.3	Volume	3/25
			March 14–22, Spring Break!	
9	3/23	19.1	Fubini's theorem	
	3/25	19.2	Change of variables formula	4/1
10	3/31	M 8.2, M 8.3	Measure 0, Lebesgue's theorem	
	4/1	M 10.1	Complex inner product spaces, Cauchy–Schwarz inequality	
			Examples of inner product spaces: $\mathbb{C}^n$, $C([a,b],\mathbb{C})$, L^2, ℓ^2	
			Exam 2: Monday, April 6, 2020, noon–1:20 p.m.	
11	4/6	M 10.1	Convergence in mean, ℓ^2, L^2 and $=$ a.e.	
	4/8	M 10.2	Orthogonal families, Bessel's inequality, Parseval's theorem	4/15
12	4/13	M 10.3	Completeness and convergence theorems	
		M 10.5	Computation of Fourier series	
	4/15		Special Topic	4/22
	4/20		**Patriots' Day: No Classes**	
	4/22		Heat equation	
	4/27		Catch-up and review	

Final Exam: Friday, May 1, 2020, 3:30 p.m.–5:30 p.m.