MATH 3150: Real Analysis

Fall 2023

Schedule of Topics, Problem Sets, and Midterm Test: The following is a tentative schedule. You are responsible for being aware of any changes. Changes will be announced during class and posted on Canvas.

Week of	**Topics, due dates for problem sets and the midterm**
September 6–8	§1: The natural numbers, $\mathbb{N}$, and proof by induction. §2: The rational numbers, $\mathbb{Q}$, and the rational zeros theorem
September 11–15	§3. The real numbers, $\mathbb{R}$, and the triangle inequality §4. The Completeness Axiom for $\mathbb{R}$ §5. The symbols $+\infty$ and $-\infty$ **Problem set 1** due on Friday the 15th
September 18–22	§7. Limits of sequences §8. A discussion about proofs
September 25–29	§9. Limit theorems for sequences §10. Monotone and Cauchy sequences §11. Subsequences **Problem set 2** due on Friday the 29th
October 2–6	§12. $\liminf$ and $\limsup$ §14. Series §15. Alternating series and integral tests
October 9–13	§17. Continuous functions §18. Properties of continuous functions §19. Uniform continuity **Problem set 3** due on Friday October 13th
October 16–20	§19. Uniform continuity (continued) §20. Limits of functions §23. Power series
October 23–27	§24. Uniform convergence §25. More on uniform convergence Review for the Midterm **Midterm** in class on Wednesday, October 25th
October 30 to November 3	§26. Differentiation and integration of power series §28. Basic properties of the derivative

Week of	**Topics, due dates for problem sets and the midterm**
November 6–10	§29. The mean value theorem §30. L'Hospital's rule **Problem set 4** due on Wednesday the 8th
November 13–17	§31. Taylor's theorem (not including items 31.8 and beyond) §32. The Riemann integral
November 20–21	§33. Properties of the Riemann integral **Problem set 5** due on Monday the 20th Thanksgiving recess, no class meeting on November 22 and 24
November 27 to December 1	§34. Fundamental theorem of calculus Begin to review for the Final Exam
December 4–6	Review for the Final Exam