

MATH 6101: Foundations of Real Analysis

Tentative Outline of Topics

Aug. 21	Day 1 a) What is the Mathematics that we teach? b) History and prehistory of numbers
Aug 28	Day 2 Topology of the reals a) Open and closed sets b) Compactness c) Completeness d) Connectedness
Sept 4	Day 3 No class – Labor Day
Sept 11	Day 4 Sequences of real numbers a) Limits and convergence b) Bolzano-Weierstrauss theorem
Sept 18	Day 5 Series of real numbers: Limits and convergence
Sept 25	Day 6 Functions a) Polynomial b) Exponential c) Logarithmic d) Trigonometric
Oct 2	Day 7 Functions e) Hyperbolic f) Elementary functions g) LambertW h) glog and brethren
Oct 9	Day 8 No class – Fall Break
Oct 16	Day 9 Limits of functions
Oct 23	Day 10 Continuity a) pointwise b) uniform
Oct 30	Day 11 Sequences of functions: limits and uniform convergence
Nov 6	Day 12 Series of functions: limits and convergence
Nov 13	Day 13 Intermediate Value Theorem
Nov 20	Day 14 Extreme Value Theorem
Nov 27	Day 15 Pathological examples of functions on the reals
Dec 4	Day 16
	Reading Day
Dec 11	Final Exam (1900 – 2200)