Mathematics 3790H – Analysis I: Introduction to analysis
Trent University, Winter 2015

Readings and Schedule

The following schedule is *tentative* – no lesson plan survives contact with actual students! – and our actual pace will be adjusted as necessary. The readings below are taken from the textbook, *Elementary Real Analysis*, by B.S. Thomson, J.B. Bruckner, and A.M. Bruckner. The textbook may occasionally be supplemented in class and on assignments with handouts or references to sources available online. It would be very much to your advantage, if possible, for you to read the given parts of the textbook before we cover them in class.

Week 1. *(5–9 January, 2015.) Classes begin on Wednesday, 7 January.* §1.4–1.6: Order properties of the real numbers, suprema and infima. It would be a good idea to read through the rest of Chapter 1, partly for review and partly to make sure you get a sense of the authors' preferred notation. *No seminar this week.*

Week 2. *(12–16 January, 2015.)* §1.6–1.7 & §2.1–2.2, 2.4–2.6: The completeness of the real numbers and the Archimedean property, sequences, convergence and divergence of sequences, bounded sequences. Quiz #1 written on Tuesday, 13 January, and Assignment #1 due on Friday, 16 January.

Week 3. *(19–23 January, 2015.)* §2.7–2.10: Algebraic and order properties of limits, Monotone Convergence Theorem. Quiz #2 written on Tuesday, 20 January, and Assignment #2 due on Friday, 23 January.

Week 4. *(26–30 January, 2015.)* §2.11-2.13: Subsequences, Cauchy Convergence Criterion for sequences, upper and lower limits. Quiz #3 written on Tuesday, 27 January, and Assignment #3 due on Friday, 30 January.

Week 5. *(2–6 February, 2015.)* §3.1–3.2, 3.4: Finite and infinite series, convergence, summation formulas. [It might be a good idea to review this material from your old calculus notes too.] Quiz #4 written on Tuesday, 3 February, and Assignment #4 due on Friday, 6 February.

Week 6. *(9–13 February, 2015.)* §3.5–3.6: Boundedness, Cauchy Convergence Criterion for series, absolute convergence, Comparison and Alternating Series Tests, Ratio and Root Tests. [It might be a good idea to review this material from your old calculus notes or textbook, too.] Quiz #5 written on Tuesday, 10 February, and Assignment #5 due on Friday, 13 February.

Winter Reading Week. *(16–20 February, 2015.)* Enjoy!

Week 7. *(23–27 February, 2015.)* §3.6–3.8: Cauchy's Condensation Test, rearrangements and products of series. Quiz #6 written on Tuesday, 24 February, and Assignment #6 due on Friday, 27 February.

Week 8. *(2–6 March, 2015.)* §5.1–5.5: Review of limits and continuity of functions, ε-δ definition of limits. [It might be a good idea to review this material from your old calculus notes or textbook, too.] Quiz #7 written on Tuesday, 3 March, and Assignment #7 due on Friday, 6 March. *The last date to withdraw from Winter half-courses without academic penalty is Thursday, 5 March.*

Week 9. *(9–13 March, 2015.)* §5.6, §9.1–9.2: Uniform continuity, pointwise and uniform convergence of sequences of functions. Quiz #8 written on Tuesday, 10 March, and Assignment #8 due on Friday, 13 March.

Week 10. *(16–20 March, 2015.)* §9.3–9.6: Uniform convergence and continuity, as well as differentiability and integrability. Quiz #9 written on Tuesday, 17 March, and Assignment #9 due on Friday, 20 March.

Week 11. *(23–27 March, 2015.)* §7.12, §10.1–10.3: Power series, convergence and uniform convergence of power series. Quiz #10 written on Tuesday, 24 March, and Assignment #10 due on Friday, 27 March. Take-home final examination distributed on Tuesday, 24 March.

Week 12. *(30 March – 3 April, 2015.) No classes on Good Friday, 3 April.* §10.4–10.7: Representing functions using power series, Taylor's Theorem, products and composition of power series. Quiz #11 written on Tuesday, 31 March.

Week 13. *6–10 March, 2015. Tuesday, 7 April, is the last day of classes.* Assignment #11 due on Tuesday, 7 April.

Winter final examination period. *(10–24 April, 2015.)* Take-home final examination due on Wednesday, 22 April.

Last modified 2014.12.05.