Math 3233 Course Outline

Winter 2023

Instructor: A.J. Dean, **email:** andrew.j.dean@lakeheadu.ca

Office hours: By zoom appointment.

References: An Analysis Textbook, by A.J. Dean, to be distributed in class.
Principles of Mathematical Analysis, by Walter Rudin;
Introduction to Real Analysis, by Bartle and Sherbert;
The Elements of Real Analysis, by Bartle.

Learner Outcomes: Successful students of this course will be able to: Recognize and construct examples of metric spaces; determine topological properties of sets in metric spaces, including connectivity, compactness, closure and interior; and construct proofs of basic results in topology using open/closed sets, limit points, connectivity, and compactness: compute limits of functions; determine continuity of functions and construct proofs of basic results on limits and continuity; understand the basic definition and properties of the derivative of a function; understand the basic definition and properties of the Riemann integral, and determine integrability of functions; understand the difference between different modes of convergence, including uniform, root-mean-square, and point-wise convergence of sequences of functions, and demonstrate these properties from the definitions in concrete examples; use the Weierstrass M-Test to demonstrate uniform convergence of series of functions, and determine when term by term differentiation and integration of series is justified. Students will also learn to present mathematical proofs in analysis at a blackboard to an audience of their peers in a clear and effective manor.

Marking Scheme: Grades will be based on weekly assignments. There will be 11 of these. They will be weighted equally, with the lowest grade being dropped. The assignments will be taken up in class, with students presenting some of their solutions. A portion of the marks will be allocated to the presentation of solutions.

Drop Date: The final date to withdraw from this course without academic penalty is Friday March 10.

Academic Dishonesty: All cases of academic dishonesty will be dealt with according to the university's Academic Integrity Code.

Accommodations: Lakehead University is committed to achieving full accessibility for persons with disabilities. Part of this commitment includes arranging academic accommodations for students with disabilities to ensure they have an equitable opportunity to participate in all of their academic activities. if you think you may need accommodations, you are strongly encouraged to contact Student Accessibility Services (SAS) and register as early as possible. For more information, please visit: http://studentaccessibility.lakeheadu.ca