Math 3231 Course Outline

Fall 2021

Instructor: A.J. Dean, RB 2009, 343-8689, andrew.j.dean@lakeheadu.ca

Office hours: By appointment. Appointments will be conducted online, not in person.

Textbook: An Analysis Textbook, by A.J. Dean, to be distributed in class.

Additional References: Principles of Mathematical Analysis, by Walter Rudin; Introduction to Real Analysis, by Bartle and Sherbert (first three editions); The Elements of Real Analysis, by Bartle; Introduction to the Theory of Numbers, by Hardy and Wright.

Learner Outcomes: Successful students of this course will be able to: understand the Zermelo-Fraenkel axiomatization of set theory, and why an axiomatic approach to set theory is necessary; understand the distinction between finite, countably infinite, and uncountable sets, and use cardinality arguments for existence proofs; carry out transfinite induction arguments involving ordinal numbers and various forms of the axiom of choice; compute the continued fraction expansion of algebraic numbers and relate properties of real numbers to properties of their continued fraction expansions; use the supremum property of the real numbers to construct existence proofs; 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.

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.

Drop Date: The final date to withdraw from this course without academic penalty is Friday November 5.

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