

Syllabus: MA 335 Advanced Calculus II

Last updated Summer 2011

Bulletin description:

This is the second of a two-course sequence designed to provide students with the theoretical context of concepts encountered in MA 125 through MA 227. Topics covered include integration of functions of one variable, pointwise and uniform convergence, integration and differentiation of series, differentiable mappings of several variables, chain rule, product rule and gradients, Mean Value Theorem, Taylor's Theorem, Inverse Function Theorem, Implicit Function Theorem. Prerequisites: MA 334.

Text:

Edward D. Gaughan, *Introduction to Analysis (5th ed.)*, American Mathematical Society 2009, ISBN 978-0-8218-4787-9, or similar text chosen by instructor.

Coverage:

Chapter 5	5 weeks
Chapter 6	5 weeks
Chapter 7	3 weeks

Note - time allotments are approximate and do not include exams. Exact choice of topics and division of material between MA 334 and 335 may vary depending on instructor and text.

Learning Objectives:

Students completing this course should show increased sophistication in their ability to read and write mathematics, understand difficult proofs, comprehend new definitions and conjecture and prove their consequences. They will:

- Know the definition of the Riemann integral, and be able to show integrability of certain classes of functions
- Be able state and apply the Fundamental Theorem of Calculus, Integral Mean Value Theorem, Change of Variables Theorem, Taylor's Theorem
- Know and be able to prove and use basic tests for convergence of series
- Know the basic theory of power series and Taylor series and methods of determining intervals of convergence
- Understand uniform convergence of sequences and series of functions, and its consequences

Additional topics, such as functions of several variables, may be added as time permits.