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Department of Mathematics

College of Liberal Arts and
Sciences

maa6616-syllabus

Analysis I

Course number 14659 Section 3053 Fall 2024

Instructor

Scott McCullough

Course Content and Objectives

This course treats the fundamentals of measure and integration theory, including L_p spaces and the Radon-Nikodym theorem; and an introduction to functional analysis, including Banach spaces, Hilbert spaces, and the theory of linear operators. Other topics that may be included (depending on time and interest) are harmonic analysis and the Fourier transform, the theory of distributions, the spectral theorem, and an introduction to probability.

References

Measure, Integration & Real Analysis by Sheldon Axler

Real Analysis: Modern Techniques and Their Applications by Gerald B. Folland

Suggested Problems

Selected problems from the course notes (available through canvas) will be assigned on a daily basis.

Homework

Homework problems, selected to complement each student's interests and course of study, will be assigned, collected, and graded.

Grading

Course grades will be based on participation and homework.

See [the current UF policy on assigning grade points](#).

Attendance

Attendance is recommended.

Additional Information:

Grades. Grading will be in accord with the UF policy stated at <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>.

Academic Honesty. The course will be conducted in accordance with the University honor code and academic honesty policy, which can be found in the [student guide](#)

Accommodation for students with disabilities. Accommodations for Students with Disabilities: “Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, <https://www.dso.ufl.edu/drc/>) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.”

Online Evaluations. “Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results/>.”

Contact information for the Counseling and Wellness Center. <https://www.counseling.ufl.edu/>; 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Tentative weekly schedule

Week 1: sigma-algebras.

Week 2: measures, outer-measures and the Caratheodory extension theorem.

Week 3: Lebesgue measure.

Week 4. Premeasures and the Hahn-Kolmogorov Extension Theorem.

Week 5. Lebesgue-Stiltjes measures

Week 6. Measurable functions.

Week 7. Integration of simple and measurable unsigned functions.

Week 8. Integration of signed and complex functions.

Weeks 9 and 10. Modes of convergence.

Weeks 11 and 12. A brief discussion of Riesz-Markov; Product measures.

Week 13. Signed measures and the Lebesgue-Radon-Nikodym Theorem

Week 14. Thanksgiving.

Weeks 15 and 16. Normed vector spaces.

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