Honors Analysis I

Instructor: Mauro Maggioni

Classes: Mon,Wed 13:30-14:45, Maryland 217; Friday 13:30-14:20, Maryland 202F

Office hours: Wed 5:15pm, Krieger 204.

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Synopsis

The course covers foundational topics in mathematical Analysis. We cover the real number system, the Lebesgue integral, metric spaces, basic functional analysis, and other topics.

Detailed Topics

- Real Numbers: sets, sequences and functions.
- Intro to Lebesgue measure, measurable functions, integration.
- Metric spaces: general properties; completeness; contraction principle.
- Topological spaces: general properties, connectedness, compactness; Baire category theorem.
- Function spaces; space of continuous functions, L^p spaces. Pointwise and uniform convergence; Arzelà-Ascoli theorem; Stone-Weierstrass Theorem.
- Continuous linear operators between Banach spaces; duality for normed linear spaces; weak topology; continuous linear operators on Hilbert spaces.

References

Real Analysis, H.L. Royden, P.M. Fitzpatrick

Grading

Grade to be based on weekly homework (10%), a written midterm exam (40% - to be held in class on Monday October the 14th) and final oral exam (50% - to be held on Wednesday December the 18th, from 9am to 12pm).

Prerequisites

Calculus III and Linear Algebra.

Additional Information

This highly theoretical sequence in Analysis is reserved for mathematics majors and/or the most mathematically able students.
All applicable Johns Hopkins University academic policies apply.