MTH301A: Analysis I

INSTRUCTOR Ashutosh Kumar
Department of Mathematics & Statistics
Indian Institute of Technology Kanpur
email: krashu@iitk.ac.in
Office: Room 606, Rajeev Motwani Building

CLASS RESOURCES **HelloIITK**: `https://hello.iitk.ac.in/`

SCHEDULE **Class dates**: July 31 to Nov. 14
Lecture: MWF 12:00 - 13:00 at L4
Tutorial: Th 12:00 - 12:50 at L4

TOPICS Review of sets, functions and cardinality, Construction of reals, Metric spaces, Completeness and Baire category theorem, Compactness, Connectedness, Uniform continuity, Sequence and series, Absolute convergence, Rearrangement theorem, Fourier series, Differentiation, Darboux theorem, Riemann integral and the fundamental theorem of calculus, Function spaces and various modes of convergence, Introduction to Lebesgue integral.

BOOKS There is no official textbook but the following could be used as references.

- W. Rudin, Principles of mathematical analysis, `https://web.math.ucsb.edu/~agboola/teaching/2021/winter/122A/rudin.pdf`
- A. Bruckner, J. Bruckner and B. Thomson, Elementary real analysis, `https://classicalrealanalysis.info/documents/TBB-AllChapters-Landscape.pdf`
- B. Gelbaum and J. Olmsted, Counterexamples in analysis, `https://faculty.ksu.edu.sa/sites/default/files/_olmsted_1.pdf`
- T. Tao, Analysis I, `https://math.unm.edu/~crisp/courses/math401/tao.pdf`

GRADES **Midterm** (40%), **Final exam** (60%).

ON HOMEWORK You are free to discuss your homework with other people but the **midterm and the final exam should be taken alone**.