

## IISER Pune - Course Content

Semester	JAN 2024
Open to Semester	4
Course Code	MT2223
Course title	Real Analysis I (E )
Nature of Course	LE - Lecture
Credit	3
<b>Coordinator</b> and participating faculty (if any)	<b>Dr. Anup Biswas</b>
Pre-requisites	Calculus I and II
Objectives	A serious student of mathematics must master the epsilon-delta language of “limits”. Familiar ideas from calculus, such as continuity, series, derivatives, and integrals are all describable in terms of limits. In this course we strengthen our analytic technique to the point where we can blend these ideas gracefully. Full proofs are the norm in this course. It is very much a prerequisite for courses in the analysis, topology, and applicable math streams* it is also strongly recommended for students pursuing theoretical physics.
Course content	<p>Real numbers, least upper bound property, (4 Lectures)</p> <p>sequences, convergence, suprema and infima, Bolzano-Weierstrass theorem, limsup, liminf, limit points, subsequences, (3 lectures)</p> <p>Infinite series, rearrangement of series, tests for convergence, (3 lectures)</p> <p>functions on <math>\mathbb{R}</math>, continuous functions, intermediate value theorem, Heine Borel theorem, uniform continuity, (4 lectures)</p> <p>Riemann integration, basic properties, Riemann integrability of continuous functions, fundamental theorem of Calculus, Integration of vector valued functions and rectifiable curves. (7 lectures)</p>
Evaluation / Assessment	<p>Quiz: 20%</p> <p>Midsem: 40%</p> <p>Endsem: 40%</p>
Suggested readings	<p>1. Analysis I &amp; II: T. Tao, TRIM Series (2006) Hindustan Book Agency</p> <p>2. Introduction to Real Analysis: R. G. Bartle and D. R. Sherbert (2011) Wiley</p>

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	3. Mathematical Analysis: T. M. Apostol (1974) Addison-Wesley 4. Principles of Mathematical Analysis: W. Rudin (1976) Tata McGraw Hill 5. Methods of Real Analysis: Goldberg (1976) Wiley
When Next	
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