

Semester Lecture Plan

Name of the college: Government college of Arts Science and Commerce ,Sanquelim Goa

**Name of Faculty: 1) Mr. Deepak Bandiwadekar
2) Mr. Vishal Gawas**

Subject: Mathematics

Paper code: MAT 200 Calculus of one variable

Program/Course: SYBSC

Division:

Academic year: 2026- 2027

Semester: III

Total Lectures: 60

Course Objectives: to understand the concept of Real Number System, its Algebra, Order & Completeness properties, real sequence & its convergence. Also about the properties of Continuity & Differentiability of real valued functions, Approximation of functions,

Expected course Outcome:

- 1) Explain the algebra and properties of the set of real numbers.
- 2) Analyze various real sequences, their properties, and examine their convergence.
- 3) Prove and apply results in limits and continuity and disprove false statements.
- 4) Prove and apply results in differentiability and disprove false statements.

Student learning outcome: The student will be able to get a practical idea about detecting Infimum & Supremum of sets, judging the behaviour of continuous & differentiable functions

Month	Lectures From: To:		No. of lectures allotted	Topic, Subtopic to be covered	Exercises/ assignment	ICT Tools	Reference books
June	22/06/2026	27/06/2026	04	Algebra of real number system; Upper and Lower bounds of subsets of $\mathbb{R}$		Chalk & Board	A. Kumar, and S. Kumaresan: A Basic Course in Real Analysis,
June/July	29/06/2026	04/07/2026	04	Least Upper Bound Property and its Applications;		Chalk & Board	A. Kumar, and S. Kumaresan: A Basic Course in Real Analysis,

July	06/07/2026	11/07/2026	04	Absolute value and their properties.		Chalk & Board	A. Kumar, and S. Kumaresan: A Basic Course in Real Analysis,
July	13/07/2026	18/07/2026	04	Sequences and their convergence; Cauchy sequences; Monotonic sequences;	Examples on sequences using ϵ	Chalk & Board	A. Kumar, and S. Kumaresan: A Basic Course in Real Analysis,
July	20/07/2026	25/07/2026	04	Sandwich Lemma; Some important limits; Subsequences. Continuous functions;	Examples on Cauchy Sequences using ϵ	Chalk & Board	A. Kumar, and S. Kumaresan: A Basic Course in Real Analysis,
July/Aug	27/07/2026	01/08/2026	04	Sequential criteria and ϵ - δ definition of continuity	Examples on Continuity using ϵ & δ	Chalk & Board	A. Kumar, and S. Kumaresan: A Basic Course in Real Analysis,
August	03/08/2026	08/08/2026	04	Intermediate value theorem; Extreme value theorem		Chalk & Board	A. Kumar, and S. Kumaresan: A Basic Course in Real Analysis,
August	10/08/2026	15/08/2026	04	Monotone functions; Limits		Chalk & Board	A. Kumar, and S. Kumaresan: A Basic Course in Real Analysis,
August	17/08/2026	22/08/2026	04	Uniform continuity and results in uniform continuity.		Chalk & Board	A. Kumar, and S. Kumaresan: A Basic Course in Real Analysis,

August	24/08/2026	29/08/2026	02	Results in uniform continuity.		Chalk & Board	A. Kumar, and S. Kumaresan: A Basic Course in Real Analysis,
Aug/Sep	31/08/2026	05/09/2026	04	Derivative of a function at a point; Geometric interpretation of a derivative		Chalk & Board	A. Kumar, and S. Kumaresan: A Basic Course in Real Analysis,
September	07/09/2026	12/09/2026	04	Algebra of derivatives; Chain rule; Properties of the derivative, Rolle's theorem, Lagrange's Mean Value Theorem		Chalk & Board	A. Kumar, and S. Kumaresan: A Basic Course in Real Analysis,
September	14/09/2026	19/09/2026	00	Ganesh Chaturthi Break (14–19 Sep)			
September	21/09/2026	26/09/2026	04	Cauchy's Mean Value theorem, and their geometric significance, Darboux theorem for differentiable functions		Chalk & Board	A. Kumar, and S. Kumaresan: A Basic Course in Real Analysis,
Sep/Oct	28/09/2026	03/10/2026	04	Higher order derivatives' Taylor's theorem; Maclaurin's theorem, Leibnitz rule for higher order derivative of product of functions	Maclurin's series expansions	Chalk & Board	A. Kumar, and S. Kumaresan: A Basic Course in Real Analysis,
October	05/10/2026	10/10/2026	04	Stationary points and their stationary point to be local maxima and minima;		Chalk & Board	A. Kumar, and S. Kumaresan: A Basic Course in Real Analysis,

October	12/10/2026	14/10/2026	2	Indeterminate forms	Additional examples on L Hospital's rule	Chalk & Board	A. Kumar, and S. Kumaresan: A Basic Course in Real Analysis,
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*** Assessment Rubrics**

Component	Max Marks
ISA 1	10
ISA 2	10
Project	--
Semester End Exam	80