							AFFE
Course Type	Course Code	Name of Course	L	т	Ρ	Credit Hrs	NULX - X
DC3	MCC203	Real Analysis	3	0	0	9	

Prerequisite: Basic Calculus

Course (Dbjective
(i)	To introduce basic concepts of metric spaces such as convergence, continuity, compactness, completeness and connectedness
(ii)	To study the important properties of differentiation and integration.
(iii)	To study sequences and series of functions.
Learning	Outcomes

The students will be able to understand (i) the basic properties of real numbers and Metric spaces (ii) the basic idea of continuity, uniform continuity and differentiability and its applications (iii) Riemann integral and its properties (iv) convergence of sequence and series of functions.

Unit No.	Topics to be Covered	Lecture Hrs	Learning Outcome
1	Set-Theoretic preliminaries, Axioms for the real number system, Consequences of least upper bound axiom, The Principle of Archimedes and its consequences, Countable and uncountable sets, Basic concepts of Metric spaces.	10	The students will be able to understand the basic properties of real numbers and Metric spaces
2	Convergent sequences, Power series, Elementary transcendental functions, Continuity, Uniform continuity, Monotonic functions, The derivatives of real functions, Mean value theorems, L'Hospital's rules, Taylor's theorem.	11	The students will learn convergence, continuity, uniform continuity and differentiability.
3	Riemann integral and its properties, Characterization of Riemann integrable functions, Fundamental theorem of integral calculus, integration by parts, Improper integrals.	10	Students will get the idea of Riemann integral and Improper integrals.

4	Sequences and series of functions, Uniform convergence and its relation to continuity, differentiation and integration, Fourier series, Fejer's theorem, Weierstrass approximation theorem.	11	The students will be able to understand convergence and uniform convergence of sequence and series of functions.	
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Text Books:

1. W. Rudin, Principles of Mathematical Analysis, 3rd Edition, McGraw-Hill, 2017.

Reference Books:

- 1. K. Ross, Elementary Analysis: The Theory of Calculus, Springer Int. Edition, 2004.
- 2. T. M. Apostol, Mathematical Analysis, 2nd Edition, Narosa, 2002.
- 3. K.R. Stromberg, An introduction to classical real analysis, AMS Chelsea Publicating, 2015.