

B.Sc. (Mathematics) (Part III) (Semester – VI)
Choice Based Credit System with Multiple Entry and Multiple Exit Option (NEP-2020)
Syllabus to be implemented from Academic Year 2024-25

Course code	:	DSE – F9
Title of course	:	Metric Spaces
Theory	:	32 Hrs. (40 lectures of 48 min.)
Marks	:	50 (Credit: 02)

Course Learning Outcomes: This course will enable the students to:

CO1: acquire the knowledge of notion of metric space, open sets and closed sets.

CO2: demonstrate the properties of continuous functions on metric spaces,

CO3: apply the notion of metric space to continuous functions on metric spaces.

CO4: understand the basic concepts of connectedness, completeness and compactness of metric spaces,

Unit –1 Limits and Continuous Functions on Metric Spaces (20 Lect.)

Limit of a function on the real line (Revision), Metric Spaces, Limits in Metric Spaces, Functions continuous at a point on the real line, Reformulation, Functions continuous on a metric space, Open Sets, Closed Sets, More about open sets.

Unit 2: Connectedness, Completeness and Compactness (20 Lect.)

Connected Sets, Bounded sets and totally bounded sets, Complete metric spaces, Compact metric spaces, Continuous functions on compact metric spaces.

Recommended Book:

1. R. R. Goldberg, Methods of Real Analysis, Oxford and IBH Publishing House.(2017).

Scope of Syllabus:

Unit 1: Chapter-4:4.1, 4.2,4.3; Chapter-5: 5.1,5.2,5.3,5.4,5.5; Chapter-6:6.1

Unit 2: Chapter-6:6.2,6.3,6.4,6.5,6.6

Reference Books:

1. T. M. Apostol, Mathematical Analysis, Narosa Publishing House.(2002)
2. Satish Shirali, H. L. Vasudeva, Mathematical Analysis, Narosa Publishing House.(2013)
3. D. Somasundaram, B. Choudhary, First Course in Mathematical Analysis, Narosa Publishing House,(2018).
4. W. Rudin, Principles of Mathematical Analysis, McGraw Hill Book Company(1976).
5. Shantinayakan, Mittal, A Course of Mathematical Analysis, S.Chand and Company(2013).
6. J.N. Sharma, Mathematical Analysis-I, Krishna Prakashan Mandir, Meerut.(2014)
7. S.C.Malik, Savita Arora, Mathematical Analysis, New age International Ltd(2005).