UNIVERSITY OF MADRAS

B.Sc. DEGREE COURSE IN MATHEMATICS

SYLLABUS WITH EFFECT FROM 2020-2021

BMA-CSC14

CORE-XIV: REAL ANALYSIS-II

(Common to B.Sc. Maths with Computer Applications)

Inst.Hrs : 6 **YEAR: III**

Credits : 4 **SEMESTER: VI**

Learning outcomes:

Students will acquire knowledge about

- The Real Numbers and the Analytic Properties of Real- Valued Functions.
- The Analytic concepts of Connectedness, Compactness, Completeness And Calculus.

UNIT I

Continuous Functions on Metric Spaces: Open sets- closed sets- Discontinuous function on R^1. Connectedness, Completeness and Compactness :More about open sets- Connected sets. Chapter 5 Section 5.4 to 5.6

Chapter 6 Section 6.1 and 6.2

UNIT II

Bounded sets and totally bounded sets: Complete metric spaces- compact metric spaces, continuous functions on a compact metric space, continuity of inverse functions, uniform continuity.

Chapter 6 Section 6.3 to 6.8

UNIT III

Calculus:Sets of measure zero, definition of the Riemann integral, existence of the Riemann integral- properties of Riemann integral.

Chapter 7 Section 7.1 to 7.4

UNIT IV

Derivatives- Rolle's theorem, Law of mean, Fundamental theorems of calculus.

Chapter 7 Section 7.5 to 7.8

UNIT V

Taylor's theorem- Pointwise convergence of sequences of functions, uniform convergence of sequences of functions.

Chapter 8 Section 8.5 Chapter 9 Section 9.1 and 9.2

Content and Treatment as in

"Methods of Real Analysis"- Richard R. Goldberg (Oxford and IBH Publishing Co)

Reference:-

1. Principles of Mathematical Analysis by Walter Rudin,TataMcGrawHill.
2. Mathematical Analysis Tom M Apostal,Narosa Publishing House.

e-Resources:

1. https://nptel.ac.in.
2. https://mathonline.wikidot.com.
3. https://en.wikipedia.org/wiki/Metric_space.