PROGRAME NAME: : B.Sc(H) Mathematics		
COURSE NAME : Metric Spaces		
SEMESTER DURATION: July to December		

Week	Topic(s)	Teaching Methodology Adopted/ Continous Internal Evaluation
1.	Defining metric spaces, Illustration using usual metric space on $\mathbb{R}$, Euclidean and max metric on $\mathbb{R}^2$ *and* $\mathbb{R}^n$, Discrete metric, Sup metric on *B(s)* and *C[a,b]*, Integral metric on *C[a,b]*	Lectures
2.	Sequences on metric space, Defining limits of sequences. Illustrations, Cauchy sequences.	Lectures/Presentations
3.	Defining complete metric spaces, Illustrations through examples.	Lectures/Presentations
4.	Open and closed balls, Neighborhood, Open sets, Examples and basic results.	Lectures
5.	Interior Point, Interior of a set, Limit point, Derived set, Examples and basic results.	Lectures
6.	Closed set, Closure of set, Limit point, Derived set, Examples and basic results.	Lectures
7.	Bounded set, Diameter of a set, Examples and basic results.	Lectures/ Group Discussions
9.	Continuous mappings, Sequential and other characterizations of continuity.	Lectures
10.	Uniform continuity, Homeomorphism.	Presentations
11.	Contraction mappings, Banach fixed point thm.	Presentations
12.	Connectedness and compactness	Lectures
13.	Definitions and properties of connectedness and compactness	Discussions
14.	Definitions and properties of connectedness and compactness contd.	Discussions

Course Objectives: The course aims at providing the basic knowledge pertaining to metric spaces such as open and closed balls, neighborhood, interior, closure, subspace, continuity, compactness, connectedness etc.

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

i) Understand the basic concepts of metric spaces;

ii) Correlate these concepts to their counter parts in real analysis;

iii) Appreciate the abstractness of the concepts such as open balls, closed balls, compactness, connectedness etc. beyond their geometrical imaginations.