



Course Syllabus
Gyanmanjari Science College
Semester-3(M.Sc.)

Subject: Topology – II (MSCMA13513)

Type of course: Major

Prerequisite: A strong understanding of set theory, basic topology, and mathematical proofs is essential for studying the advanced topics in Topology.

Rationale: Topology – II provide a framework for understanding topological spaces, their properties, and the relationships between them. They are fundamental to the study of topology and its applications in mathematics.

Teaching and Examination Scheme:

Teaching Scheme			Credits C	Examination Marks					Total Marks
CI	T	P		Theory Marks		Practical Marks		CA	
			ESE	MSE	V	P	ALA		
4	0	0	4	60	30	10	-	50	150

Legends: CI-ClassRoom Instructions; T – Tutorial; P - Practical; C – Credit; ESE - End Semester Examination; MSE-Mid Semester Examination; V – Viva; CA - Continuous Assessment; ALA- Active Learning Activities.

CourseContent:

Unit No.	Course content	Hrs	% Weight age
1	CHAPTER 1: Normal space, Regular space, T ₃ – space, T ₄ – space.	15	25
2	CHAPTER 2: Semi-regular space, Completely regular space, Tychonoff space, Urysohn's Lemma.	15	25
3	CHAPTER 3: Metriization, Nets, cluster point, subnet.	15	25
4	CHAPTER 4: Filter, filter base, ultrafilter.	15	25



Continuous Assessment:

Sr. No.	Active Learning Activities	Marks
1.	Exploring Separation Axioms Students 'understanding of separation axioms and their implications in different types of topological spaces' handouts/ word document must be uploaded on to the GMIU web portal.	10
2.	Understanding Separation Properties: Students 'explore the different separation axioms and their implications in various types of topological spaces' and handouts/ word document upload to the GMIU web portal.	10
3.	Topology Exploration: Metrization: Students define a metric (distance function) for Euclidean plane and discuss how different metrics impact open sets and convergence and prepare summary and upload it to the GMIU web portal.	10
4.	Investigating Filters and Ultrafilters: Students will prepare summary on real-world scenarios where filters and ultrafilters play a role and upload it to the GMIU web portal.	10
5.	Prepare a Power Point Presentation: Students prepare a power point presentation on Discuss real-world applications of topology and upload it to the GMIU web portal.	10
Total		50

Course Outcome:

After learning the course the students should be able to:	
CO1	Understand topological spaces, separation axioms, and their properties.
CO2	Explore advanced concepts like completely regular spaces and Urysohn's lemma.
CO3	Study convergence using nets, cluster points, and subnets.
CO4	Grasp filters, ultrafilters, and their applications in real analysis.



Suggested Specification table with Marks (Theory): 60

Distribution of Theory Marks (Revised Bloom's Taxonomy)						
Level	Remembrance (R)	Understanding (U)	Application (A)	Analyze (N)	Evaluate (E)	Create (C)
Weightage	10%	40%	30%	10%	10%	-

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Instructional Method:

The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MCQ etc.

From the content 10% topics are suggested for flipped mode instruction.

Students will use supplementary resources such as online videos, NPTEL/SWAYAM videos, e-courses, Virtual Laboratory

Reference Books:

1. Munkres J. M. :Topology: A First Course, PHI (1978)
2. Kelley J.L.: General Topology, Van Nostrand Company, Inc. (1955)
3. Sims B. T.: Foundations of Topology, Collier MacMillan International Edition, (1976).
4. Gemignani M.C.: Elementary Topology, Addison-Wesley, (1967).
5. Joshi K. D.: Introduction to General Topology, Wiley Eastern Ltd. (1983).
6. Gupta K.P.: Topology, Pragati Prakashan, (2015).

