TOPOLOGY

Semester	Subject	Category	Lecture		Theory		Practical	Credits
	Code							
III	21CPM	Core –	Hrs/Week	Hrs/Sem	Hrs/Week	Hrs/Sem	0	5
	A3C	Paper XI	6	90	6	90		

COURSE OBJECTIVES:

The students will be able to

- Study topological spaces in continuous functions, connectedness, compactness, countability and separation axioms.
- Develop topological and proof writing skills which are essential in the study of advanced mathematics.

COURSE OUTCOMES:

On the successful completion of the course, the students will be able to

CO	CO Statement	Knowledge
Number		Level (K1-K4)
CO1	Understand Open bases and open sub bases, Weak topologies,	K2
	the function algebras $C(X, R)$ and $C(X, C)$.	
CO2	Derive Stone-Weierstrass theorems and understand its	K3
	applications.	
CO3	Discuss connected spaces, the components of a space and	K3
	Totally disconnected spaces	
CO4	Discuss Tychonoff's theorem, locally compact spaces,	K3
	Compactness of metric spaces and Ascoli's theorem	
CO5	Distinguish Urysohn's lemma and the Tietze extension	K4
	theorem.	

Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze.

MAPPING WITH PROGRAMME OUTCOMES:

COS	PO1	PO2	PO3	PO4	PO5	PO6
CO1	S	S	Μ	Μ	S	М
CO2	Μ	S	Μ	S	Μ	S
CO3	S	S	S	Μ	М	S
CO4	S	М	Μ	М	Μ	Μ
CO5	S	S	S	S	S	Μ

S – Strong; M – Medium; L - Low

UNIT - I: TOPOLOGICAL SPACES

Topological spaces – Basis of a topology – the order topology – The product topology on X, Y – The Subspace topology – closed sets and limit points.

Chapter 2: section 12 to 17.

UNIT – II: CONTINUOUS FUNCTIONS

Continuous functions – the product topology – the metric topology.

Chapter 2: sections 18 to 21 [omit section 22]

UNIT – III: CONNECTEDNESS

Connected spaces – connected subspaces of the real line – components and local connectedness.

Chapter 3: section 23 to 25.

UNIT -IV: COMPACTNESS

Compact spaces - compact subspaces of the real line - limit point compactness - local compactness.

Chapter 3: sections 26 to 29

UNIT - V: COUNTABILITY AND SEPARATION AXIOM 18 Hours

The countability Axioms - The separation axioms - Normal spaces - The Urysohn lemma - The Urysohn Metrization theorem - The Tietz extension theorem Chapter 4: sections 30 to 35.

DISTRIBUTION OF MARKS: THEORY 90% AND PROBLEMS 10%

TEXT BOOK

S.NO	AUTHORS	TITLE	PUBLISHERS	YEAR OF PUBLICATION
1.	James R. Munkres	Topology,[2 nd edition],	Pearson Education Pvt Ltd	2002

18 Hours

18 Hours

18 Hours

18 Hours

REFERENCE BOOKS:

S.NO	AUTHORS	TITLE	PUBLISHERS	YEAR OF PUBLICATION
1.	J. Dugundji	Topology	Prentice Hall of India	1975
2.	George F. Sinmons	Introductions to Topology and Modern Analysis	McGraw Hill Book Co	1963
3.	S. Willard	General Topology	Addison Wesley Mass	1970

WEB RESOURCE

https://www.dpmms.cam.ac.uk/Topological Spaces-notes.pdf

TEACHING METHODOLOGY

- 1. Class room Teaching
- 2. Assignments
- 3. Seminars
- 4. Discussions
- **5**.PPT Presentations

SYLLABUS DESIGNER

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