	National Institute of Technology Meghalaya An Institute of National Importance	**CURRICULUM**

Programme	**Master of Science**	Year of Regulation	**2018-19**
Department	**Mathematics**	Semester	**III**

Course Code	Course Name	Pre-requisite	Credit Structure				Marks Distribution			
			L	T	P	C	INT	MID	END	Total
MA 537	**Topology**	**NIL**	**3**	**0**	**0**	**3**	**50**	**50**	**100**	**200**

Course Objectives	The aim of the course is to provide for the students an introduction to theory of topological spaces building foundation for higher studies in pure mathematics.	Course Outcomes	CO1 Understand a topological space and provide examples of standard topological spaces. CO2 Understand basis and sub basis of topological spaces and should be able to produce bases and sub bases of various standard topological spaces. CO3 Demonstrate the understanding of open sets, closed sets and related concepts. CO4 Understand subspace topology and related result. CO5 Demonstrate the understanding of product space and quotient space. CO6 Use continuous functions and homeomorphisms to understand structure of topological spaces. CO7 Demonstrate knowledge and understanding compact and connected topological spaces. CO8 Apply theoretical concepts in topology to understand real world applications.

No.	COs	Mapping with Program Outcomes (POs)												Mapping with PSOs		
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	CO1															
2	CO2															
3	CO3															
4	CO4															
5	CO5															
6	CO6															
7	CO7															
8	CO8															

SYLLABUS

No.	Content	Hours	Cos
I	Definition and examples of topological spaces, basis and sub basis, order topology, subspace topology, closure, limit point, boundary, interior.	**8**	**CO1** **CO2** **CO3** **CO4**
II	Continuity and related concepts, product topology, metric topology, quotient topology, countability axioms, Lindel of spaces and separable spaces.	**10**	**CO5** **CO6** **CO8**
III	Connected spaces and connected sets, component, path connectedness, path component, local connectedness, local path connectedness.	**7**	**CO7** **CO8**
IV	Compact spaces and compact sets, limit point compact and sequentially compact spaces, locally compact spaces, one point compactification, finite product of compact spaces, statement of Tychonoff's theorem.	**7**	**CO7** **CO8**
V	Separation axioms, Urysohn's lemma, Tietze's extension theorem, statement of Urysohn's metrization theorem.	**4**	**CO1** **CO3** **CO8**
Total Hours		**36**	

Essential Readings

1. J. R. Munkres, "Topology", Pearson Education India; 2nd edition, 2015.
2. G. F. Simmons, "Introduction to Topology and Modern Analysis", McGraw Hill Education, 1st edition, 2017.

Supplementary Readings

1. C. W. Patty, "Foundations of Topology", Jones & Bartlett Publishers, 2010.
2. K. D. Joshi, "An Introduction to General Topology", New Age International Private Limited, 2017.