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

Programme	**Bachelor of Technology**		Year of Regulation	**2019-20**
Department	**Mathematics**		Semester	**VI**

Course Code	Course Name		Pre-Requisite	Credit Structure				Marks Distribution			
				L	T	P	C	INT	MID	END	Total
MA 372	**Linear Optimization**		**MA 101**	2	0	0	2	50	50	100	200

Course Objectives	To introduce linear optimization theory	Course Outcomes	**CO1**	Able to identify and express a decision problem as a linear programming problem and apply appropriate methods to find an optimal solution.
			CO2	Able to recognize and formulate transportation, assignment problems and drive their optimal solution.
	To use operations research techniques for effective decisions-making problems		**CO3**	Able to formulate and solve network model as linear programming problem.
			CO4	
			CO5	
			CO6	

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**				**2**											
2	CO2	**2**				**2**											
3	CO3	**2**				**2**											
4	CO4																
5	CO5																
6	CO6																

SYLLABUS			
No.	Content	Hours	COs
I	**Linear Programming and Simplex Method:** Introduction to linear programming problem (LPP), Geometry of linear programming, Graphical method, simplex method, two phase method, Degeneracy in LPP; Duality in LPP, dual simplex method, and sensitivity analysis.	**10**	**CO1**
II	**Transportation Model and its Variants:** Transportation problem, initial basic feasible solution, MODI method, degeneracy, unbalanced problem; Assignment problem, Hungarian method	**08**	**CO2**
III	**Network models:** Shortest-route problem, network representation, critical path (CPM) computations, PERT calculation.	**06**	**CO3**
Total Hours		**24**	

Essential Readings

1. H. A. Taha, "Operation Research: An Introduction", Pearson Education, 10th edition, 2019.

2. M. S. Bazaara, J. J. Jarvis and H. D. Sherali, "Linear programming and Network flows", Wiley India Pvt. Ltd, 2nd edition, 2008.

Supplementary Readings

1. D. G. Luenberger and Yinyu Ye, "Linear and Nonlinear Programming", Springer India, 3rd edition, 2010

2. F. S. Hillier, G. J. Lieberman, B. Nag and P. Basu, "Introduction to Operations Research", 9th edition, McGraw Hill Education, 2009.