

UNIVERSITY OF MADRAS
M.Sc. DEGREE PROGRAMME IN MATHEMATICS
 SYLLABUS WITH EFFECT FROM 2023-2024

Titleofthecourse		OPERATIONSRESEARCH					
PaperNumber							
Category	Elective	Year	II	Credits	3	Course	528E3C
		Semester	III				
Pre-requisite		UGLevelOperationsResearch					
CourseOutline		<p>UNIT-I : Decision Theory :Steps in Decision theory Approach – Types of Decision-MakingEnvironments – Decision Making Under Uncertainty – Decision Making under Risk – PosteriorProbabilities and Bayesian Analysis – Decision Tree Analysis – Decision Making with Utilities.</p> <p>Chapter10 :Sec. 10.1 to10.8</p>					
		<p>UNIT-II : Network Models :Scopeof Network Applications – Network Definition – Minimalspanning true Algorithm – Shortest Route problem – Maximum flow model – Minimum costcapacitated flow problem- Network representation – Linear Programming formulation – CapacitatedNetworksimplexAlgorithm.</p> <p>Chapter6:Sections 6.1to6.6 fromH.A.Taha :OperationsResearch</p>					
		<p>UNIT-III:DeterministicInventoryControlModels:MeaningofInventoryControl–Functional Classification – Advantage of Carrying Inventory – Features of Inventory System –Inventory Model building- Deterministic Inventory Models with no shortage – DeterministicInventorywith Shortages</p> <p>ProbabilisticInventoryControlModels:Single Period Probabilistic Models without Setup cost – Single Period Probabilities Model withSetup cost.</p> <p>Chapter13:Sec.13.1 to13.8</p> <p>Chapter14:Sec.14.1 to14.3</p>					

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	<p>UNIT-IV:QueueingTheory:EssentialFeaturesofQueueingSystem– OperatingCharacteristicofQueueingSystem– ProbabilisticDistributioninQueueingSystems–Classification of Queueing Models – Solution of Queueing Models – Probability Distribution ofArrivalsand Departures– Erlangian Servicetimes Distributionwith k- Phases.</p> <p>Chapter15 :Sec.15.1 to15.8</p>
	<p>UNIT-V :Replacement and Maintenance Models: Failure Mechanism of items – Replacementof Items that deteriorate with Time – Replacement of items that fail completely – otherReplacementProblems.</p> <p>Chapter16: Sec.16.1 to16.5</p>
<p>Recommended Text</p>	<ol style="list-style-type: none"> 1. (ForUnit2):H.A.Taha, OperationsResearch,6th edition,PrenticeHalof India 2. (ForallotherUnits):J.K.Sharma,OperationsResearch, MacMillanIndia,NewDelhi,2001.
<p>ReferenceBooks</p>	<ol style="list-style-type: none"> 1. F.S.HillerandJ.Lieberman-,Introduction toOperationsResearch(7thEdition),TataMcGraw Hill PublishingCompany, New Delhui,2001. 2. Beightler.C,D.Phillips,B.Wilde,FoundationsofOptimization(2ndE dition)PrenticeHallPvtLtd.,New York, 1979 3. Bazaraa,M.S;J.J.Jarvis,H.D.Sharall,LinearProgrammingandNetw orkflow,JohnWileyand sons, New York 1990. 4. Gross, D and C.M.Harris, Fundamentals of Queueing Theory, (3rd Edition), Wiley and Sons,NewYork, 1998.