DEPARTMENT OF MATHEMATICS

Semester: III **Integrated M.Sc. Mathematics** **Academic Year : 2019 -20**

Subject: 060090304

SEC1 Mathematical Logic & Function

Teaching Schedule

Objective of the course:

To introduce basic concepts of Discrete mathematics to extend its use in advanced set theory, Fuzzy theory and topology.

Course Outcomes: Upon completion of the course, students shall be able to

CO1: To develop logical thinking in terms of predicates, quantifiers and logical connectives.

CO2: Can reproduce the formal pertaining to relation.

CO3: Can refute the validity of property about relations and functions with a counter example.

CO4: Analyze the growth of functions.

CO5: Be familiar with special type of functions.

Sub Unit	No. of Lecture (s)	Topics	Reference Chapter/ Additional Reading	Teaching Methodology to be used	Active Learning Activities	Evaluation parameter
Unit 1: Mathematical Logic [06hours]						
1.1	1	Introduction	Ch# 1 T Veerarajan	Chalk and Talk	**For Slow learner:** Students must solve examples given by subject faculty after completion of unit **For Advanced learner:** Students will solve some difficult examples given by teacher after completion	Assignment-1 Unit test-1 Internal examination
1.2	1	propositions, truth table, negation, conjunction and disjunction				
1.3	1	Propositional equivalence: Logical Equivalences				
1.4	1	Implication, Biconditional Preposition, Converse, contra positive and inverse propositions and precedence of logical operators				
1.5	2	Predicates and quantifiers: Introduction, Quantifiers, Binding variables and Negation				
Unit 2: Relation [07 hours]						
2.1	2	Product set, Composition of relations		Chalk and Talk	**For Slow learner:** Students must solve examples given by subject faculty after completion of unit **For Advanced learner:** Students will solve some difficult examples given by teacher after	Assignment-2 Unit test-1 Unit test-2 Internal examination
2.2	1	Types of relation, Partitions				
2.3	2	Equivalence Relations with example of congruence modulo relation				
2.4	1	Partial ordering relations				

2.5	1	GLB and LUB, closures of relation	Ch#2 T Veerarajan		completion	
Unit 3: Function [07 hours]						
3.1	1	Representation of function	Ch#3 T Veerarajan	Chalk and Talk	**For Slow learner:** Students must solve examples given by subject faculty after completion of unit **For Advanced learner:** Students will solve some difficult examples given by teacher after completion	Assignment-3 Unit test-2 Internal examination
3.2	2	Types of function				
3.3	3	Classification, Composition, Inverse, Binary and n-ary operation,,				
3.4	1	Mathematical induction.				
Unit 4: Special Types of Function[06 hours]						
4.1	1	Characteristic function of sets	Ch#4 T Veerarajan	Chalk and Talk	**For Slow learner:** Students must solve examples given by subject faculty after completion of unit **For Advanced learner:** Students will solve some difficult examples given by teacher after completion	Assignment-4 Internal examination
4.2	1	Hashing functions				
4.3	1	Recursive functions				
4.4	3	Recursion, Primitive recursive function, Permutation function.				

Text books:

1. Discrete mathematics and its applications, Kenneth H. Rosen, Mc Graw Hill Education.
2. Discrete mathematics with Graph Theory and Combinatorics, T Veerarajan, Tata Mcgrraw hill Companies.

Reference book:

1. Discrete Mathematical Structure, Kevin Ferland, Cengage Learning India Private Ltd.

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SEC1 Mathematical Logic & Function

Course Units and Course Outcomes Mapping:

Unit No.	Unit	Course Outcomes				
		CO1	CO2	CO3	CO4	CO5
1	Mathematical Logic	✓				
2	Relation		✓	✓		
3	Function			✓	✓	
4	Special types of function					✓

Programme Outcomes (PO)

PO1: Knowledge

Provides knowledge about the fundamentals of pure, applied and computing mathematics and its applications to students that creates the opportunities in industries and research centers.

PO2: Core Competence

Creates competency in science and mathematics to formulate, analyses and solve problem and/or also to pursue advanced study or research.

PO3: Breadth

Trains students having good knowledge in unearth core of academia and industry by the roots of mathematics.

PO4: Evaluation

Imparts in students to raise trial and error-based curiosity and problem-solving functionality with research based advanced tutorial for higher level decision makings tools.

Programme Outcomes and Course Outcomes Mapping:

Programme Outcomes	Course Outcomes				
	CO1	CO2	CO3	CO4	CO5
PO1	✓				✓
PO2		✓		✓	✓
PO3			✓		
PO4			✓	✓	✓