DEPARTMENT OF MATHEMATICS
FACULTY OF ENGINERING AND TECHNOLOGY
SRM UNIVERSITY

MA0531- DISCRETE MATHEMATICS

SEMESTER: I **ACADEMIC YEAR: 2012-2013**

LECTURE SCHEME / PLAN

The objective is to equip the students of Computer Science and Computer Application with the knowledge of Mathematics and its applications so as to enable them to apply them for solving real world problems.

The list of instructions (provided below) may be followed by a faculty relating to his/her own schedule includes warm-up period, controlled/free practice, and the respective feedback of the classes who handle. The lesson plan has been formulated based on high quality learning outcomes and the expected outcomes are as follows

Each subject must have a minimum of 50 hours, which in turn, 45 hours for lecture and rest of the hours for tutorials. The faculty has to pay more attention in insisting the students to have $\leq$ 95 % class attendance.

UNIT I: MATHEMATICAL LOGIC			
Lect. No	**Lesson schedule**	**Learning outcomes**	**Cumulative hours**
L 1.1	Proposition and logical connectives, conditional and bi-conditional and statements	Students will be able to understand Logic and mathematical reasoning to apply in their fields	1
L1.2	Equivalence of formulas		2
L.1.3	Tautological implications		3
L.1.4	Theory of inference for statement calculus		4
L.1.5	Theory of inference : Problems solving		5
L.1.6	Indirect Method		6
L.1.7	Consistency		7
L.1.8	Predicate calculus - quantifiers		8
L.1.9	Tautological implications Theory of inference for predicate calculus		9
L.1.10	Valid formulas in predicate calculus, theory of inference in predicate calculus		10

L.1.11	Predicate calculus : Problems solving		11
CYCLE TEST – I			**DATE: 1/10/12**
UNIT II:			
Lect. No	**Lesson schedule**	**Learning outcomes**	**Cumulative hours**
L.2.1	Introduction to Mathematical Induction	Students will be able to understand the different types of proof on Mathematical arguments.	12
L.2.2	Problems on Mathematical Induction		13
L.2.3	More Problems on Mathematical Induction		14
L.2.4	Introduction to Pigeon hole principal		15
L.2.5	Problems on Pigeon hole principal		16
L.2.6	More Problems on Pigeon hole principal		17
L2.7	Introduction to Principal of inclusion and exclusion		18
L.2.8	Problems on Principal of inclusion and exclusion		19
L.2.9	More Problems on Principal of inclusion and exclusion		20
UNIT III: RECURRENCE RELATION & ALGEBRAIC SYSTEMS			
L.3.1	Formation and solving recurrence relations	Students will become familiar with techniques of Recurrence Relation, Generating functions	21
L.3.2	Recurrence relations obtained from solutions		22
L.3.3	Solution of homogenous finite order relations		23
L.3.4	Solution of Non-homogeneous finite order relations		24
L.3.5	Generating functions – Solution of a recurrence relation using generating functions		25

L.3.6	Problems		26
L.3.7	Problems on Recursive functions		27
L.3.8	Problems on Primitive Recursive functions		28
L.3.9	Problems on Computable Function		29
L.3.10	Problems on non Computable Function		30
SURPRISE TEST DATE: 15.10.2012			
UNIT IV: GROUPS			
Lect. No	**Lesson schedule**	**Learning outcomes**	**Cumulative hours**
L.4.1	Introduction to Group	Students will become familiar with techniques of Algebraic Systems and their applications	31
L.4.2	Definition and Examples on Groups		32
L.4.3	Definition and Examples on Cyclic Groups		33
L.4.4	Definition and Examples on Permutation Groups		34
L.4.5	Definition and Examples on Sub groups		35
L.4.6	Definition and Examples on Homomorphism and Isomorphism		36
L.4.7	Problems on Cosets		37
L.4.8	Concepts on Lagranges theorem		38
L.4.9	Definition on normal subgroups		39
L.4.10	Cayley's representation theorem		40
UNIT V: LATTICES AND BOOLEAN ALGEBRA			
L.5.1	Partial order relation		41
L.5.2	Problems on Partial order relation		42

L.5.3	Posets, Lattices	Students will be able to understand Lattices and Boolean algebra and their application	43
L.5.4	Problems on Posets, Lattices		44
L.5.5	Hasse Diagram		45
L.5.6	Problems on Hasse Diagram		46
L.5.7	Boolean algebra		47
L.5.8	properties		48
L.5.9	Problems on Boolean algebra		49
L.5.10	Practice Problems		50
MODEL EXAM		**19.11.2012 (Duration: 3 Hours)**	
LAST WORKING DAY : 30.11.2012			

REFERENCES

- Tremblay J.P. and Manohar R., "Discrete Mathematical Structures with applications to Computer Science", Tata Mc Graw Hill Publishing Co., 2000
- V. Sundaresan, K. Ganesan and Ganapathy Subramanian, “Discrete Mathematics”, A.R. Publications.
- T. Veerarajan, “Discrete Mathematics with Graph Theory and Combinatorics”, Tata McGraw Education Private Limited.
- Venkataraman M.K., etal. "Discrete Mathematics", National Publishing Co.
- Seymour Lipschutz, Marc Lars Lipson, "Discrete Mathematics", Mc Graw Hill Inc., 1992
- Kolman and Busby, "Discrete Mathematical Structures for Computer Science", 1987
- Iyengar N.Ch.S.N. etal," Discrete Mathematics", Vikas Publishing Ltd.

WEB BASED RESOURCES

http://www.the-science-lab.com/Math/

http://botw.org/top/Science/Math/

http://dir.yahoo.com/Science/Mathematics/

http://www.cms.caltech.edu/

http://www.en.wikipedia.org

Internal marks Total: 50

Internal marks split up: Cycle Test 1: 25 Marks
Model Exam: 25 Marks
Term Paper: 10 Marks
Surprise Test: 5 marks
Attendance: 5 marks

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