CLUSTER UNIVERSITY SRINAGAR

SYLLABUS (FYUP UNDER NEP 2020)

Offered By Department Of MATHEMATICS

Semester 1st Skill Enhancement Course (SEC)

Course Title: Mathematical Logic

Course Code: UGMTH22S101
Credits: 4 (Theory: 3, Practical: 1)
Contact Hrs: 60

Max. Marks 100
Theory External: 15; Min Marks: 06
Theory Internal (Continuous Assessment): 10 Marks, Min Marks: 04
Practical Experimental Basis= 45 Marks, Min. Marks: 18
Practical Internal (Continuous Assessment): 30 Marks, Min. Marks: 12

Course Objectives/ Outcomes:

After the completion of this course, the students shall be able to:

1. formulate logically equivalent statements.
2. check validity of arguments using rules of inference.
3. to investigate the truth value of quantified statements.

Unit-I

Proposition, compound proposition, basic logical operations: conjunction, disjunction, negation. Truth table, tautologies and contradiction, logical equivalence of propositions, algebra of propositions, DeMorgans' laws, conditional and biconditional statements, inverse, converse and contrapositive of a conditional statement.

Unit-II

Construction of truth tables for compound propositions, proving laws of algebra of proposition using truth tables, simple problems on logical equivalence of two compound propositions, equivalence of a conditional statement and its contrapositive, equivalence of p => q and ~ p V q, equivalence of p ⇔q and ~ p ⇔~ 9.

Unit-III

Arguments, validity of an argument, rules of inference: conjunction, simplification, addition, law of detachment (modus ponens), modus tollens, law of contrapositive, disjunctive syllogism, hypothetical syllogism. Propositional functions, quantifiers, universal quantifier, existential quantifier, negation of quantified statements.

Unit-IV

Simple problems on validity of arguments, checking validity of argument by using truth table and critical row, checking validity of argument by using rules of inference, examples on finding negation of universal quantified statements and existential quantified statements.

Text Books Recommended:

(1) Discrete Mathematics and its Applications by Kenneth H. Rosen, McGraw Hill Education.
(2) Discrete Mathematics and Applications by Thomas Koshy, Academic Press.
(3) Symbolic Logic by Irving M. Copi, Pearson Education India