

Applied Logic (CSC-306)
Tribhuvan University
Institute of Science and Technology
Soch College of Information Technology

Course Title: Applied Logic

Course no: CSC-306 ----- Full Marks: 60+20+20

Credit hours: 3 -----Pass Marks: 24+8+8

Nature of course: Theory (3 Hrs.) + Lab (3 Hrs.)

Course Synopsis: This course contain the main feature of different logics.

Goal: The course objective is to provide the basic concepts and techniques of the logics used in computer science.

Course Contents:

Unit 1. Introduction ----- 4 Hrs.

Introduction to Logic, Nature of Argument, Truth and Validity, Symbolic Logic, Statements, Conditional Statements, Statement Forms

Unit 2. Deduction and Deductive Systems ----- 6 Hrs.

Formal Proof of Validity, The Rule of Replacement, The Rule of Conditional Proof, The Rule of Indirect Proof, Proofs of Tautologies, Formal Deductive Systems, Attribute of Formal Deductive Systems, Logicist Systems

Unit 3. Propositional Logic----- 6 Hrs.

Syntax of Propositional Logic, Semantics of Propositional Logic, Calculations, Normal Form, Applications

Unit 4. Predicate Logic -----8 Hrs.

Predicate Logic, Order of Predicate Logic, Syntax of Predicate Logic, Semantics of Predicate Logic, Consequences, Calculations, Normal Form

Unit 5. Resolution & Proofs -----10 Hrs.

Resolution, Resolution in Propositional Logic, Unification of Clauses, Resolution in Predicate Logic, Horn Clauses, Proof in Propositional Logic and Predicate Logic, Axiomatic Systems, Adequacy, Compactness, Soundness.

Unit 6. Program Verification ----- 5 Hrs.

Issue of Correctness, Partial Correctness, Hoare Proof, Total Correctness.

Unit 7. Some Other Logics ----- 6 Hrs.

Intuitionistic Logic, Lukasiewicz Logic, Probabilistic Logic, Fuzzy Logic, Default Logic,

Autoepistemic Logic.

Laboratory works:

Laboratory exercises should be conducted in any logic programming language like LISP or PROLOG.

Text / Reference books:

1. Arindama Singh, Logics for Computer Science, Prentice Hall of India
2. Irving M. Copi, Symbolic Logic, 5th Edition, Prentice Hall of India