Logic for Computer Science (IT424)
Credit Structure:  3-0-0-3

Prerequisites (if any)/desired skill set: Discrete Mathematics
Foundation for: Formal Software Verification

Course objective: Students are expected

(1) To learn syntax and semantics(its meaning) of propositional logic and first order logic and its decision procedures
(2) To learn the deductive systems and its soundness and completeness in propositional logic and first order logic
(3) To learn how propositional and predicate logic is used in verifying programs.

Course content:

Propositional Logic

Syntax, Semantics, Semantic tableaux, Hilbert systems, Gentzen systems, Resolution procedure, Natural Deduction

First Order Logic

Syntax, Semantics, Semantic tableaux, Hilbert systems, Gentzen systems, Resolution procedure, Natural Deduction

Verification of Sequential Programs
Semantics of programming languages, Deductive system HL, Program verification, Soundness and completeness of HL

**Suggested textbook/references:**

**Text Books**
2. Logic in Computer Science: Modelling and reasoning about systems, M. Huth, M. Ryan, Cambridge University Press, 2004

**References**
1. The Essence of Logic, J. Kelly, PHI, 2001