[A-3]COURSE SYLLABUS

1. Course Description (Approximately 100 words)

Logic has been called "the calculus of computer science". It plays an important role in areas of Computer Science (example: the logic gates), software engineering (specification and verification), programming languages (semantics, logic programming), databases (relational algebra and SQL), artificial intelligence (automatic theorem proving), algorithms (complexity and expressiveness), and theory of computation (general notions of computability). generally, its a major unit that plays a major role in the science of computers

2. Course Goals and Objectives (Approximately 100 words)

This course Provides the student with a thorough introduction to computational logic, covering in depth the topics of syntax, semantics, decision procedures, formal systems, and definability for both propositional and first-order logic. The material is taught from a computer science perspective, with an emphasis on algorithms and computational complexity. The goal is to prepare the students for using logic as a formal tool in computer science.

3. Textbook (Title, Author, Publisher, Year of Publication, etc.)

1. Logic for Computer Science Steve Reeves and Michael Clarke. Addison-Wesley, 1990. ISBN: 0-201-41643-3
2. Logic for Computer Science. Jean H. Gallier. Harper and Row, New York, 1986.
3. First-Order Logic and Automated Theorem Proving. Melvin Fitting. Springer Verlag, Berlin, 1990.
4. A Mathematical Introduction to Logic. Herbert B. Enderton. Academic Press, New York, 1972.
5. Natural Deduction (A Proof-theoretical study). Dag Prawitz. Almqvist and Wiskell, 1965

4. Reference

1. ML for the Working Programmer by L.C. Paulson, Cambridge University Press.
2. Logic for Computer Science Steve Reeves and Michael Clarke. Addison-Wesley

5. Course Requirements and Grades

CAT =30%
ASSIGNMENTS =10%
EXAMINATION =60%
TOTAL =100%

6. Course Calendar

Week	Main Content
1	Propositional Logic
2	Propositional Logic: Applications
3	First-Order Logic: Syntax and Semantics
4	First-Order Logic: Proof and Deduction
5	First-Order Logic: Soundness and Completeness
6	First-Order Logic: Compactness and Models
7	CAT / ASSIGNMENT
8	First-Order Logic: Theories
9	First-Order Logic: Applications
10	Undecidability: Introduction
11	Undecidability: Representability
12	Undecidability: Godel's Incompleteness Theorem
13	Second-Order Logic and Temporal Logic
14	EXAMINATION