IT424 Logic for Computer Science

Instructor: Manoj Kumar Raut
Semester: Autumn 2018

Course Description:

This course will give a logical introduction to propositional logic, propositional modal logic and applications of modal logic. In propositional logic, students will learn about the syntax and semantics of propositional logic and soundness and completeness of one of its proof methods. Modal Logic begins with the study of modalities in its many forms: reasoning about necessity and possibility, knowledge and other modal notions. The course covers core concepts of propositional modal logic and selected applications of modal logic. Topics that will be discussed include: propositional logic, Normal modal logic, model theory (upto Characterization results), Frame theory, Soundness and completeness.

The main objective is that students will be able to learn how to use modal logic in philosophy and computer science and they will be able to design new logical systems using existing modal logic and analyze their properties.

Literature:


Additional reading:

Grading Policy:

Insem I: 30%
Insem II: 30%
Presentation: 20%
Participation: 10%
Quiz: 10%

Tentative Syllabus:

Propositional Logic

Syntax, Semantics, Natural deduction, Soundness, Completeness

Propositional Modal Logic

Syntax, Semantics using models and frames, Normal Modal Logic, Bisimulation, Characterization and definability, Frame definability, Soundness, Completeness

Applications

Epistemic Logic, Logic and information dynamics