Computing Science Course Outlines  2018 Fall

CMPT 701 - G100 Computability and Logic

Instructor(s): Eugenia Ternovska  SFU Burnaby

Calendar Objective/Description:
Deep connections between logic and computation have been evident since early work in both areas. More recently, logic-based methods have led to important progress in diverse areas of computing science. This course will provide a foundation in logic and computability suitable for students who wish to understand the application of logic in various areas of CS, or as preparation for more advanced study in logic or theoretical CS.

Instructor’s Objectives:
This course is cross-listed with CMPT 409

Modern logic grew out of efforts to provide a formal foundation for mathematics in the early 20th century, at the centre of which are fundamental results by Gödel, Turing, and other luminary figures, establishing close ties between logic and computation. Logic has turned out to be a powerful tool in computer science, and most working logicians today are computer scientists. This course will provide an introduction to basic results in logic and computability, and also introduce ways in which logic is applied in modern computer science.

Prerequisites:
None

Topics:
- Propositional Logic
- First-Order Logic
- Proof Systems (Theorem Proving)
- Computability
- Recursive and Recursively Enumerable Sets
- Gödel's Theorems
- Applications: SAT, Complexity, Databases, Constraint Languages, Theorem Proving, Verification, etc.

Grading:
Assignments, tests, exam. To be discussed in the first week of classes.

Required Books:
Computability and Logic - Course Notes, Stephen A. Cook, These notes will be available from the course web page.

Reference Books:

Academic Honesty Statement::
Academic honesty plays a key role in our efforts to maintain a high standard of academic excellence and integrity. Students are advised that ALL acts of intellectual dishonesty will be handled in accordance with the SFU Academic Honesty and Student Conduct Policies (http://www.sfu.ca/policies/gazette/student.html).