

SC/MATH 1090

Introduction to
Logic for Computer Science

York University

Department of Computer Science and Engineering

SC/MATH 1090

- SC/MATH 1090 3.00
Introduction to Logic for Computer Science
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- Textbook:
G. Tourlakis, *Mathematical Logic*, John Wiley & Sons, 2008. ISBN 978-0-470-28074-4
- *Prerequisites:* SC/MATH 1190 3.00 or SC/MATH 1019 3.00

Grading

- Assignments: 4 assignments, 30% total
- Midterm exam (30%)
- Final exam (40%)

Others

- Course News, schedule, assignments, etc
www.cse.yorku.ca/course/1090/1090.htm
- Course outline, important dates
www.cse.yorku.ca/course/1090/outline.htm
- Policies
 - Academic honesty
 - Missed exams
 - Late assignments = not-submitted assignment!

Mathematical Logic

- The Science of mathematical reasoning
 - The study of the form, meaning, use, and limitations of logical deductions, called proofs.
- Builds the formal tool for mathematical reasoning
- Relies on syntax (form of statements) rather than on semantics (meaning)
- Studies semantics
 - Are the proven theorems actually true? (**soundness**)
 - Can our logic prove all that is true? (**completeness**)

Overview

- SC/MATH 1090 Introduction to Logic for Computer Science
 - **Propositional Logic (or Boolean Logic)**
 - Boolean formulae (syntax)
 - Induction on formulae
 - Boolean semantics (truth tables)
 - Proofs and theorems
 - Soundness and completeness theorems
 - **Predicate Logic (or First-Order Logic)**
 - Syntax
 - Proofs and theorems
 - Semantics, soundness and completeness (Gödel's)

Workload

- After each class:
 - Study your class notes
 - Read the book, do proofs yourself without looking
 - Do related assignment questions
 - Try to do exercises in the text
 - Try to do additional exercises at the end of chapters
 - Write down your questions and ask TAs during tutorial/office hours or ask me during my office hours
 - Make sure you understand posted solutions to assignments
- Before each class
 - Review your notes
 - Print slides, take a look at what is going to be covered