SE212

Andy Zhang

Fall 2014

Contents

Chapter 1

Module 1 — Sept 8

1.1 Logic and Computation, module 1

1.1.1 Contact

Amirhossein Vakili, avakili@uwaterloo.ca
SE212 Mon/Wed 11:30 to 12:50 RCH 305
Office Hours: Tues 2:30 to 3:30 DC2551

1.1.2 Course content

How do you know what a program is supposed to do? (specification/correctness)

- Inspection
- Testing
- **Formal verification**

1.1.3 Logic

Formal verification
Logic is based on logical reasoning, also called 'formal methods' or 'computer-aided verification'. It checks the correctness of a program for all outputs. Since this takes a lot of effort, it is complementary to testing and inspection.

Logic
A logic consists of:

- *syntax* What is an acceptable sentence
- *semantics* What do the symbols and sentences in the language mean?
- *proof theory* How do we construct valid proofs?

Logic provides a way to express knowledge precisely and to reason consequences of that knowledge

1.1.4 Course Outline

Four main topics:

- Propositional logic
- Predicate logic
- Set Theory and Specification
- Program correctness

1.1.5 Marking Scheme

- 20% assignments (top 7 out of 8 assignments)
- 25% Midterm exam
- 55% Final exam