CAS 734 Winter 2005

00 Preliminaries

Instructor: W. M. Farmer

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Instructor

Dr. William M. Farmer

Office: ITB 163

Extension: 27039

E-mail: wmfarmer@mcmaster.ca

Web: http://imps.mcmaster.ca/wmfarmer/

Office hours: TR 14:30-16:00

Course Mechanics

- Lectures: TR 10:30-11:45
- Course web site:

  `http://www.cas.mcmaster.ca/~wmfarmer/CAS-734-05/`

- No required text

Mission

- Learn what formalized mathematics is and how to use it in the specification and analysis of complex systems.
- Learn how to express mathematical models as axiomatic theories in higher-order logic and set theory.
- Learn how to develop axiomatic theories.
- Learn how to use interactive theorem proving systems.

Work Plan

- Lectures in class
- Exercises outside of class
  - Most will require the use of an interactive theorem proving system
- Student presentations in class
  - Should be about 15 minutes long
- Students are required to learn how to use at least two interactive theorem proving systems, one being the IMPS Interactive Mathematics Proof System
- No tests or exams

Policy Statements

1. Significant study and reading outside of class is required.

2. Students are expected to regularly attend the lectures and to ask questions.

3. Exercises may not be turned in late.

4. Academic dishonesty will not be tolerated!

5. Students may be asked to defend their written work orally.

6. Suggestions on how to improve the course and the instructor's teaching methods are always welcomed.

Tentative Schedule

00 Preliminaries

01 What is Formalized Mathematics?

02 The Traditional Axiomatic Method

03 Interactive Theorem Proving Systems

04 The IMPS Interactive Mathematical Proof System

05 Styles of Formal Proof

06 Practice-Oriented Logics

07 Definition and Specification Principles

08 The Little Theories Method

09 Symbolic Computation in Formal Proofs