

COMP SCI 1FC3 — Mathematics for Computing

7 January 2013

Instructor: Dr. Wolfram Kahl, Department of Computing and Software, ITB-245
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Calendar Description:

Introduction to logic and proof techniques; functions, relations, and sets; counting; trees and graphs; concepts are illustrated using computational tools.

Schedule: Lectures: Monday, Wednesday, Thursday 16:30–17:20, JHE-264
Tutorials: Tue. 9:30–11:20 / Tue. 14:30–16:20 / Fri. 11:30–13:20
all (at least initially) in BSB-244, starting 8 January

Office Hour: TBA (see course page) and by appointment

Students are expected to **attend all lectures**, and to **attend at least one tutorial each week**.

Course Pages: <http://www.cas.mcmaster.ca/~kahl/CS1FC3/2013/>

This is where you find further information, especially concerning tutorial organization and software installation. Electronic versions of the assignment sheets will also be kept there.

It is the student's responsibility to be aware of the information in the course pages, and to check regularly for announcements.

Goal:

This course will teach the mathematical foundations of computer science.

To a large degree, this can be seen as analogous to acquiring **language skills**, including **knowledge** and **skills** concerning syntax, semantics, pragmatics, and vocabulary of the **language of (discrete) mathematics**.

Conscious and precise use of this language is the foundation for **precise specification and rigorous reasoning**, which take a central place in this course.

Main Textbook:

David Gries, Fred B. Schneider. *A Logical Approach to Discrete Math*. Springer, 1993. ISBN: 978-0387941158

Additional material may be handed out or may be made available electronically via the course pages or Avenue.

Rough Outline:

Topic	Textbook	Time
Substitution, Equational Reasoning Rewriting, Boolean Expressions	Chapters 1–2	≈2 weeks
Propositional Reasoning	Chapters 3–5	≈2.5 weeks
Predicate Logic	Chapters 8–9	≈2 weeks
Predicates and Programming	Chapter 10	≈1 week
Sets	Chapter 11	≈1 week
Relations and Functions	Chapter 14	≈1.5 weeks
Induction and Sequences	Chapters 12–13	≈1.5 weeks
Graphs, Counting	Chapters 19, 16	≈1.5 weeks

Not all sections of the listed chapters will necessarily be taught, and not necessarily together with their chapter and in the sequence listed above. Sections of other chapters may be included as well.

After mathematical notations, presentation rules, and proof rules have been introduced in class, **students are expected to know them at all times**.

Exercise Sheets and Tutorials:

In most weeks, an **Exercise Sheet** will be provided. These sheets will contain **Exercise Questions** and **Assignment Questions** that will usually be due about a week after they are provided.

Every week, starting January 8, there will be two-hour tutorial sessions in three sections as scheduled. The main purpose of the tutorials is to discuss *student work* on exercise problems (except for the initial tutorials, which will concentrate on teaching LaTeX skills and basic use of CalcCheck). Therefore, every student is expected to complete the scheduled work, i.e., exercise problems or necessary reading, *before* the corresponding tutorial session — in particular, solutions and solution attempts to the Exercises and Assignment Questions on the weekly exercise sheets are to be brought to the tutorial.

Accommodations for missed work,

including **late assignments**, require the corresponding form from the Associate Dean's office. Where you use the electronic system, note that you are still **required** to get in touch with the instructor to actually be granted any accommodation.

Grading:

All examinations in this course will be **Closed Book**. That is, no written or printed material nor a calculator nor other electronic aids may be used during the examinations.

Assignments

Most assignments will require electronic submission of **scanned or (legibly) photocopied handwritten solutions**, and will be graded only summarily; evaluation will be conducted mostly via the midterm tests and the final.

It is essential that you meet the deadlines for the Assignment Questions; there is no credit for documents handed in after the deadline.

If you cannot hand in your assignment on time **due to (e.g.) illness reasons**:

- **Hand your assignment in as soon as possible.** For electronic submission, there will normally be a “LATE dropbox” on Avenue. If the assignment in question required handing in paper, hand your solution either to the instructor, or to a TA, or to Tina in the departmental office. (Last resort outside office hours: Insert into the drop box in front of the departmental office ITB-202.) We will make note of the time of your submission.
- **Follow the usual procedures for missed work** with your Associate Dean’s office. The outcome of that process will decide whether/how the late submission can be counted.

Midterm Tests

There will be **four midterm tests**, all closed book. Students who are absent at the time of a test are assigned **0%** as result for that test.

Final Exam

The **final examination** will be scheduled by the Registrar’s Office in the usual way. It will be a closed book examination of three hours duration and cover the material of **all** lectures, tutorials, handouts, and assignments.

Grade Calculation

All exam grades will be percentage grades.

For every student, the course grade is calculated as a weighted average:

- 12% of the weight are given to the assignments.
- Those midterm tests where your grade is better than your final grade count 16% each, and those midterms that are not better than your final count 8% each. The weight of midterm tests where the absence is excused and acknowledged as such by the instructor will be moved to the final.
- The remaining weight (between 24% and 56%) is given to the final.
- Some exercise sheets or assignments may contain **bonus questions**; marks for solutions to these will be added to the final mark for those who have passed the course.

The course grade will be converted from a percentage grade to a letter grade according to the scale of the Registrar’s Office.

The instructor reserves the right to conduct any deferred exams orally.

Academic Ethics

You are expected to exhibit honesty and use ethical behaviour in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and academic integrity.

Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behaviour can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: “Grade of F assigned for academic dishonesty”), and/or suspension or expulsion from the university.

It is your responsibility to understand what constitutes academic dishonesty. For information on the various types of academic dishonesty please refer to the Academic Integrity Policy, located at: <http://www.mcmaster.ca/academicintegrity>

The following illustrates only four forms of academic dishonesty:

- (1) Plagiarism, e.g. **the submission of work that is not one’s own** or for which other credit has been obtained.
- (2) **Collaboration where individual work is expected.**

You have to produce your submissions for assignment questions yourself, and without collaboration (except where and as far as group work is explicitly allowed or specified by the assignment statement).

For each assignment question, there will normally be exercise questions similar to it — you **are allowed** to collaborate on these **exercise questions**. (The tutorials are typically not expected to cover all exercise questions.)

- (3) Improper collaboration in group work.

- (4) **Copying or using unauthorised aids in tests and examinations.**

Course Adaptation

The instructor and university reserve the right to modify elements of the course during the term.

The university may change the dates and deadlines for any or all courses in extreme circumstances. If either type of modification becomes necessary, reasonable notice and communication with the students will be given with explanation and the opportunity to comment on changes.

It is the responsibility of the student to check their McMaster email and course websites weekly during the term and to note any changes.

Discrimination

The Faculty of Engineering is concerned with ensuring an environment that is free of all adverse discrimination. If there is a problem that cannot be resolved by discussion among the persons concerned, individuals are reminded that they should contact the Department Chair, the Sexual Harassment Office or the Human Rights Consultant, as soon as possible.