

Course Outline for MATH 1C03 Introduction to Mathematical Reasoning

Fall term 2018–2019

Course Home Page The course home page is on Avenue to Learn. It can be found at [Avenue to Learn](#).

Instructor Dr Deirdre Haskell HH316, ext 27244, haskell@math.mcmaster.ca

Office hours: M Th 10:30–12:00 or by appointment

Course meeting times: M 9:30–10:20, T 10:30–11:20, Th 9:30–10:20 in HH 109

Teaching assistants: To Be Assigned

Textbook *The Tools of Mathematical Reasoning*, by Tamara J. Lakins, American Mathematical Society.

The textbook is *required*. You will be reading from it regularly, and the homework assignments will be problems from the book.

Course structure There are three lectures and one tutorial per week. You should plan to attend all of these.

Course objective The goal of this course is to learn how to think in a more sophisticated way about mathematics. Until now, you have succeeded in your math courses by being good at calculations. Now we also want to think about the reasoning that comes behind the calculations, and justifies them. We will be learning how to read, create and communicate proofs in mathematics. By the end of this course, you will be able to look at a mathematical statement and explain it in words. You will be able to articulate the formal structure of the statement, and use that to think about how you might set about proving it. You will recognise the structure of a rigorous mathematical argument.

Assessment

Homework: 20% There will be a homework assignment every week (except the weeks after a midterm). Of the ten homework assignments, the eight best marks will count towards your homework mark. This means that you can miss two assignments with no explanations required. *There will be no further allowances for MSAFs or any other reason.* Homework is due in class on Tuesdays, *at the beginning of class*. Late assignments will not be accepted. Homework will be returned in tutorial.

Reading Assignments: 10% Reading is assigned in preparation for every class. You should do the reading, and then answer the question posted on Avenue. The Reading Assignment must be completed by 8am on each class day. Of the approximately 33 reading assignments, 25 will count towards the mark. No excuses or late assignments will be accepted.

Midterms: 30% There will be two midterms, each worth 15% of the final grade. They will be held in class, and currently are scheduled for Thursday October 4 and Thursday November 16.

Final: 40% On a date scheduled by the registrar's office.

MSAF In the event of an absence for medical or other reasons, students should review and follow the Academic Regulation in the Undergraduate Calendar Requests for Relief for Missed Academic Term Work. No relief will be granted for missed Homework Assignments or Reading Assignments, as

allowance is already made in the grading method for missing of occasional items in these categories. If you miss a midterm, there will be a make-up exam scheduled in the following week.

Academic Accommodation of Students with Disabilities Students who require academic accommodation must contact Student Accessibility Services (SAS) to make arrangements with a Program Coordinator. Academic accommodations must be arranged for each term of study. Student Accessibility Services can be contacted by phone 905-525-9140 ext. 28652 or email sas@mcmaster.ca. For further information, consult McMaster University's Policy for Academic Accommodation of Students with Disabilities.

McMaster Policy on Academic Integrity You are expected to exhibit honesty and use ethical behaviour in all aspects of the learning process. The academic credentials that 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: [Academic Integrity Policy](#). The following illustrates only three forms of academic dishonesty: 1) plagiarism, e.g., the submission of work that is not ones own or for which other credit has been obtained; 2) improper collaboration in group work; 3) copying or using unauthorized aids in tests and examinations.

Please Note 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 students to check **their McMaster email** and course websites weekly during the term and to note any changes. Announcements will be made in class and by using the course email distribution list.

Approximate course schedule

Chapter 1: Language, Logic and Proof Sept 3–10

Chapter 2: Techniques of Proof Sept 11–18

Chapter 3: Induction Sept 21–24

Chapter 4: Sets Sept 25–Oct 1

Chapter 5: Functions Oct 4–5 and 15–19

Chapter 6: Introduction to Number Theory Oct 22–Nov 2

Chapter 7: Equivalence Relations Nov 4–14

Chapter 8: Finite and Infinite Nov 19–26

Chapter 9: Foundations of Analysis Nov 30–Dec 5