

MATH 335: INTRODUCTION TO MATHEMATICS

Course outline

TEACHING AND LEARNING TEAMS

The faculty instructor is Fok-Shuen Leung (fsl@math.ubc.ca). The tutorial instructor is Hannah Le Boudier (lebouder.2018@alumni.ubc.ca).

You will be assigned to a learning team at the beginning of the course. Your homework assignments and team presentations are to be done in these teams.

SCHEDULE

Important information is contained in the course calendar, which is available on the Canvas course page. This is a very important document. Download a copy and display it prominently.

Items listed in blue are optional. All other items are mandatory. Items that are underlined are facilitated by your tutorial instructor, Hannah. All other items are facilitated by your faculty instructor.

COURSE GOALS

This course has two main goals. The first is to reintroduce some interesting and fundamental ideas of mathematics. The second is to instill the idea that mathematics is something dynamic that can be *learned*, not just *memorized*. At the end of the course, you should be better at mathematics and better at teaching it. Hopefully, you will also like it just a little bit more.

Think back to your own schooling: do you remember how easy it was to learn from teachers who liked what they taught? Do you remember how hard it was to learn from teachers who hated what they taught? The purpose of this course is to do something like unclogging a spring at the head of a river. The effect may be small at first; but downstream, where your students drink the water, it may be transformative.

COURSE COMPONENTS

Modules. There are four modules in the course. Each one has the following components.

- *Applications.* Each module begins with two applications, or stories, that introduce the topic of the module. The applications are covered in the first two classes of each module.
- *Fundamental concepts.* Following the applications, we introduce a fundamental mathematical concept having to do with the topic of the module. The concept is covered in the third class of each module.
- *Homework and test review.* The fourth class of each module is an open question-and-answer session to help you complete the homework assignment and prepare for the test.
- *Tests.* The fifth class of each module is a test. The tests are designed to be 60 minutes long. You will have 75 minutes to write, scan and upload your solutions.
- *Team presentations.* In the sixth class of each module, two learning teams will present an application related to the topic of the module. Presentations should be 20-minute, scaled-down versions of the applications that begin each module. Topics and a template will be provided. Presentations should be mathematically correct, interesting and interactive. Think of them as practice runs for your own teaching, an opportunity to introduce new ideas to your classmates.

Assessments. There are four assessment components.

- *Homework.* Each module will have one homework assignment containing questions on each of the two applications and the fundamental concept of the module. The assignments are meant to promote a particular kind of careful, deep thinking that is fundamental to mathematics. They will initially look unfamiliar and challenging — but you can do them! *Do not procrastinate.* Homework assignments are to be done in learning teams. Each homework assignment is worth 10% of your final grade.
- *Tests.* Each module will have one test. Like the homework, the test will contain questions on each of the two applications and the fundamental concept of the module. Tests are to be done individually. Each test is worth 10% of your final grade.
- *Team presentations.* Your learning team will be assigned at the beginning of the course to a module and a topic. Your team presentation is worth 10% of your final grade.
- *Participation.* Your participation grade is based on your attendance and active participation. It is worth 10% of your final grade.

Tutorials and office hours. Tutorials are mandatory sessions with your tutorial instructor, Hannah, in which you will work through problems related to tests and homework assignments. Office hours are non-mandatory opportunities to ask questions about course material, other kinds of math, or anything else you wish.

TIPS FOR SUCCESS

Put in the time and effort. Math is not easy, but it is achievable and transparent: you learn by doing, and the more you do, the better you get. The expectation is that you spend at least six hours per week outside the classroom on this course. No matter who you are, or what your prior abilities are, this time will pay off.

Keep up. For six days each week, schedule one hour per day to work on math. Don't fall behind. If you are struggling with some material, make sure to seek help from me, your tutorial instructor Hannah, or your classmates. However...

Don't be too hard on yourself. ...realize that some struggle is good and necessary. Learning anything worthwhile can be frustrating. Failing to get something on the first, or second, or even the third try is completely normal! Your aim should be progress.

Work together. You are encouraged to work on all assignments together. However, you must write your solutions in your teams, with no sharing between teams.

YOUR GRADE

You will receive a percentage grade for this course. UBC assigns corresponding letter grades: A (80% or higher), B (68% to 79%), C (55% to 68%), D (50% to 54%) and F (below 50%). Here is a rough description of what the grades mean.

- A. A grade of *A* means that you have mastered the core goals of this course. You have demonstrated competency and confidence, and are able to engage with unfamiliar mathematics in an effective and creative way.
- B. A grade of *B* means that you have achieved the core goals of this course. You have demonstrated competency and confidence, but need to spend more time and effort to achieve mastery. You are able to engage with familiar mathematics, but may struggle with engaging with unfamiliar mathematics.

- C.* A grade of *C* means that you have achieved at least one of the core goals of this course. You are basically competent with the mathematical concepts and techniques covered in the course, but often make computational errors, and struggle to see how the concepts and techniques fit together.
- D.* A grade of *D* means that you have achieved at least one of the core goals of this course, but that you required extra support to do so. There are multiple areas where you need to shore up your competency, and you are working at a level where teaching basic mathematics will likely be difficult.
- E.* A grade of *F* means that you have not achieved the core goals of this course. This grade often indicates a lack of engagement. You are encouraged to retake the course; but more importantly, to have a serious discussion with me or your academic advisor about your perception of mathematics, what went wrong in the course, where you can improve, and what steps to take before attempting to retake it.

Regardless of your grade, I encourage you to follow up with me following the course to discuss your future with mathematics. As the course will emphasize, mathematical learning is lifelong, and there are many ways to make that continuing project more productive and empowering.