Math 2090 Course Outline

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Abstract

This is a math course for students who wouldn't otherwise take a math course. In particular, it is meant for anyone whose past relationship with math was less than ideal, and who wants to get on better terms with the subject. It is intended in particular for Education students who anticipate a career as an elementary school teacher. Whatever your major, you'll find yourself some day in a room full of ten year olds, trying to get them excited about fractions. Our goal in this course is to help ease any anxieties you may have, to ensure that those anxieties don't get passed along to the kids in your classroom.

1 Introduction to Math 2090

Welcome to Math 2090, Number Systems. This course is intended for students who do not have a strong background in mathematics, and who typically will take no other courses in mathematics at the university level. Most students who take the course are in Education, and thinking about teaching at the elementary level. Because of this, education-related themes will appear throughout the course.

There are many of us in this class, coming from many different backgrounds and situations. If the "default settings" for the class don't work for you, please don't hesitate to ask for accommodation. Not everyone has reliable high speed internet. Not everyone is able to attend scheduled classes without work/family/life getting in the way. But everyone deserves a fulfilling, enjoyable learning experience in each class.

We begin with some introductions: to the university, to the staff, and to the course.

1.1 Welcome to the University of Lethbridge

Oki, and welcome to the University of Lethbridge. Our University's Blackfoot name is Iniskim, meaning Sacred Buffalo Stone. The University of Lethbridge acknowledges and deeply appreciates the Siksikaitsitapii peoples' connection to their traditional territory. We, as people living and benefiting from Blackfoot Confederacy traditional territory, honour the traditions of people who have cared for this land since time immemorial. We recognize the diverse population of Aboriginal peoples who attend the University of Lethbridge and the contributions these Aboriginal peoples have made in shaping and strengthening the University community in the past, present, and in the future.

Everything you need to know for the course will flow through our Moodle learning management system. Make sure you check in regularly to keep on top of what's happening in the course. (Possibly the hardest part of learning online is keeping track of deadlines.)

Don't hesitate to reach out if you have questions. I'll do my best to answer all of your course-related questions as quickly as possible. If you have questions that are not related to the course, you can ask those too, and I'll try to answer, or to direct you to someone who can. Some resources can be found on the University's Health and Safety website.

1.2 Course staff and contact information

Math 2090 is running for Summer 2021 as a blended course. We will meet twice each week. Officially there is a "lecture" and a "tutorial" but the distinction between the two may often be blurred. Classes run every Tuesday and Thursday, beginning on Tuesday, May 4th, and ending on Thursday, June 10th.

My name is Sean Fitzpatrick. I can be reached via email at sean.fitzpatrick@uleth.ca.

Office hours: I'll do my best to arrive a few minutes early for class. If you do too, that's a great time to get in some questions (or attempt to influence the content of that day's lesson). Individual office hour appointments can be booked using **Calendly**. Details for this will be provided on Moodle, once I've met with you, and figured out what times work best for everyone.

1.3 Course description

This course was originally developed by Shelly Wismath (now Dean of Liberal Education) as a course for future elementary school teachers. The topics have varied from year to year, but some themes have persisted:

- A look at how numbers are represented in different historical and cultural contexts.

- Hands-on work with different types of arithmetic, including numbers in bases other than 10, and modular ("clock") arithmetic.

- Fundamentals of arithmetic, including rules of algebra, fractions, and prime numbers.

- Some simple (but real) applications.

We will look at each of these topics. We will also discuss the Alberta Education curriculum for mathematics in K-6 (some version of it), and we will spend time talking about how to make mathematics a more inclusive and welcoming space.

To the extent this is possible online, we will try to make a lot of the learning hands-on, and in groups.

1.4 Course structure

The course is set up with synchronous meetings (via Zoom) every Tuesday and Thursday morning. Class meetings will be used primarily for discussion and activities. I will try to minimize the amount of time I spend presenting content, although there will always be opportunities to ask for clarification and examples.

I hope that you can all make it to these meetings. It's also understandable if you can't. Bad internet. Bosses who don't understand that online classes still have, well, classes. Maybe you have to share your computer with your little brother. Maybe travel restrictions mean that when class meets, it's 2 am where you are.

I'll do my best to also support asynchronous learning when needed. Lots can be done on your own time, even if you do make it to class. In class discussion will be supplemented by online discussion forums. (There will be a lot of that, actually.) Assessments like assignments, quizzes, and presentations are meant to be done in class, and done in groups. If we have three or more students who would prefer the option of doing the course asynchronously, I will work with you to figure out how you can do the in class work out of class.

In Subsection 2.4 you're going to see that there are lots of pieces to your grade. And yes, most of them have deadlines. But don't worry! Most of those pieces are small: designed to be done in class, or to take up no more than an hour or so of your time. Learning any kind of math is a marathon, not a sprint. So I'm giving you a little bit to do every day. Keep at it, and you'll do well. (Also, many deadlines are flexible, so don't hesitate to ask if you need more time.)

2 Essential course information

This section covers essential course information, including the meeting times, textbook, and grading scheme.

2.1 Course website

The primary course website is Moodle. On Moodle, you can expect to find:

1. Links to important resources, like this syllabus, and the textbook.

2. Links to key course activities, like discussion forums.

3. Details about your grades and assessments.

4. A daily topics schedule. (Usually this would be a weekly schedule, but in summer session, a day is a week!)

As you learn to navigate online learning (and as I learn how to guide you), the weekly topics schedules will be key to staying on top of your course material. Every week you can expect to receive details on readings, videos, homework, and assessments, as well as information on what will be taking place in class, and how to access those classes.

2.2 Scheduled classes

We meet every Tuesday and Thursday, in three hour blocks. Three hours of uninterrupted Zoom sounds pretty awful, so I'll try to break things up a bit. Times below are suggestions and will probably vary considerably.

- 9:00 — 9:30: review of readings. (General class discussion)

- 9:30 — 10:00: a quick math lesson.

- 10:00 — 10:30: Q&A, or coffee break, as needed.

- 10:30 — 11:00: presentations (sometimes by me, sometimes by you)

- 11:00 — 11:45: hands-on work (quizzes, assignments, etc.)

For the first couple of weeks, I'll provide the activities during the last part of class. (This is technically our "tutorial" portion.) Later in the term, I hope we will have some groups interested in taking the lead on some of these activities.

2.3 Course textbook

Mathematics for Human Flourishing, by Francis Su.

The primary textbook for the class is arguably not a textbook. It's not a free/open resource either, but in this case I'm willing to break with my usual policy, because it's an excellent book, and one that I think will give you a perspective on mathematics you haven't encountered before. You can expect to be asked to read (and report on) on chapter of Francis Su's book before each class.

The book should be available through the campus bookstore, but you can also find it in various formats (including e-book) through online retailers.

For mathematical content, we will refer to the book Mathematics for Elementary Teachers, by Michelle Manes. This book *is* a free OER textbook. You can access it online, and the bookstore will print you a copy if desired. (For most students, I think online access will be sufficient.)

Other resources will be provided on Moodle.

2.4 Grading scheme

Our assessment principles this year:

- No big high stakes assessments: lots of little ones instead.

- More concepts, and less rote computation. (That's what this course is about anyway.)

- Classes (the synchronous part) will be used for work, not lecture. (Nobody wants to sit though a 3 hour Zoom lecture, including your instructor.)

- Group work is good for you. (Even if you don't always like it!)

- No single assessment should ever tank your grade, and you should be able to learn from your mistakes.

With that last point in mind, we will ***not*** use weighted categories for grading. There are categories, yes. But grade items in any category will earn you points, and your grade will depend only on the total points acquired, and not the categories they come from. (This is a *cumulative* grading scheme.)

Some activities, like presentations and papers, are one and done. For others, like quizzes and assignments, you'll have an opportunity to revise and resubmit your work once you've received feedback.

The various graded components of the course are explained below. At first it will seem like there's a lot to do! But most items are small, and many can be done during class time.

Journal entries There will be a journal forum on Moodle, where you will be asked to write a short reflection after each class. Some days I may assign a topic, but most days you'll be free to reflect on whatever seems appropriate: what you thought of that day's class, the readings, what you liked (or didn't), what you found difficult, etc.

Discussion forums There will be two or three different forum types. One will be for discussion of the readings. Another will be for sharing of resources you found online. We may also have a third forum for asking about the math done in class.

Quizzes and Assignments These will cover the mathematical content in the course, and will be done in class. Assignments will be done in groups. Quizzes will be done individually, but there will also be an opportunity to discuss each quiz as a group. Any quiz or assignment can be revised and resubmitted for additional credit.

Presentations In the past, a highlight of Math 2090 was seeing students present on topics, and even lead activities. (Activities have included everything from worksheets to relay races!) For several of the topics we discuss, I will leave some of the details to students. One topic where we traditionally have students present is the K-6 curriculum.

Paper or project There is often room for one individual end-of-term paper or project. This could be a researched essay, or something practical or creative.

Final exam The final exam will cover the mathematical topics introduced during the course, but it's not as scary as it sounds. Many of you will be in a position where you don't need a particularly high exam score to earn the grade you want.

Table 2.1 List of point values for activities

Activity	Max point value (per item)	Max point value (total)
Forum posts	10	600
Journal entries	15	180
Quizzes	20	120
Assignments	30	150
Presentations	50	150
Paper/Project	150	150
Final exam	250	250

Table 2.2 Conversion of points to letter grades

A+	A	A-	B+	B	B-	C+	C	C-	D+	D
1500	1300	1200	1100	1000	950	900	850	800	750	700

3 Technology elements

To facilitate online teaching, our course will rely on several technological solutions. This section provides details on navigating the technology.

3.1 OneNote

IT provides us with a OneNote *class notebook*. This is a OneNote notebook that includes sections where I can share content with you (read only), as well as a personal section for each student (accessible only by you and me), and a *collaboration space* that can be used for group work.

You will need to use your U of L account to sign into Office 365. Once you do, you can access our class notebook from a web browser, the desktop program, or the mobile app.

I will probably ask you to do your quizzes and assignments using OneNote. If you have a tablet device, it can be quite convenient to work directly in OneNote, but you can also import content from elsewhere. (This includes simply working on paper and pasting in a photograph of your work.)

For assignments, I will set each group up with a section in the collaboration space that only members of the group can access.

3.2 Crowdmark

We may not need Crowdmark for this course. But just in case I'm wrong about this, here are some details. For ease of reference, I've placed advice for using Crowdmark on a separate page.

Basic advice:

- Start each question on a clean sheet of paper.

- Use a scanner, or a scanning app on your smartphone. PDF is best, but JPG and PNG files are also supported.

- When you submit, make sure your pages are in order, and rotated correctly.

3.3 Zoom and other video

Classes and tutorials will meet using Zoom. This is the officially supported meeting app for U of L classes, so you'll very quickly become familiar with (and tired of) Zoom.

We will *not* use Zoom for "content delivery". This is the job of the textbook and the prerecorded videos. Those videos are embedded into the textbook, so you can watch them as you read. Alternatively, you can subscribe to my channel on YouTube.

List 3.1 Zoom guidelines and etiquette

- Sign on using your U of L email and your proper name. I'm hoping to be able to put you into "breakout rooms" using pre-assigned groups. This will not work if your name doesn't match what's on the class list.

- Please **do** mute your microphone when everyone is together in the main room. You can unmute if you want to ask a question.

- Please **don't** mute your microphone while in a breakout room. (With reasonable exceptions: some of you might be in noisy environments, such as a construction site, or a house with kids.)

- About cameras. I will never require you to turn your camera on. Some of you may have very good reasons why you do not want to turn your camera on, and some of you may not even have a camera to turn on. But if you are willing to turn your camera on, it does help me, since I can use the visual cues you provide to tell if you understand what we're discussing.

  When you are working with your group, in a breakout room, please consider turning on your camera, even if you otherwise don't. It makes it much easier to work as a group if you can see each other.

List 3.2 Asking questions during class

1. Using the chat box in Zoom. This is probably most useful to quickly ask for clarification on something I just said.

2. Using your voice! There is a "raise hand" feature if you don't want to interrupt, but it's often perfectly reasonable to interrupt, especially if you notice me getting something wrong!

Group work in Zoom. During most Zoom sessions, you will be put into smaller breakout rooms to work on problems. Breakout rooms are not recorded, and I cannot actively monitor the breakout rooms — these are essentially private working sessions for your group. I *do* have the ability to join a breakout room temporarily, but will only do so when invited. If you need my help during a breakout session, there is an "Ask for help" button you can use to get my attention.

You will be encouraged to use Microsoft OneNote to collaborate with your group. OneNote lets you type notes, insert photos, and use handwriting, if you have a touch-enabled device. Unlike the Zoom chat and whiteboard features, your OneNote notebook will remain available after class for you to refer to. See Subsection 3.1 for more details.

Recording. First of all: I do not intend to record entire Zoom meetings. I will record parts of class where I am presenting an example or exercise. When I do, I will set up Zoom to record only me, and whatever I am presenting. Any videos I record will be

uploaded to Moodle using the **YuJa** platform, and will not be shared outside of that system.

Please be aware that it is an ***academic offence*** to record a class, or anyone in it, without prior authorization. If all members of a breakout room agree to having someone record your discussion, this is fine. When are in the "main room" of Zoom, recording is not permitted.

4 Course policies (an FAQ)

This section deals with questions about accommodations, missed tests, and other exceptional (yet common) cases.

1. *Is there a class code of conduct?*

   Yes. This class is designed to provide an inclusive space for all students, including those who have previously been made to feel like they don't belong in a math class. I expect everyone to treat their classmates with dignity and respect. I expect interactions during group work and in-class presentations to be mutually supportive, and never judgemental. In short, be kind.

2. *I don't think I can attend the classes regularly. Can I still take the course?*

   Short answer: yes. I recognize that not all students have access to the same technology. If your home internet is unreliable, attending Zoom sessions could be a challenge. If you can't attend synchronous sessions, I will arrange alternatives for graded work done asynchronously. I will also try to connect you with other students in the same situation, so that you still have a group you can work with.

3. *What happens if I get sick?*

   I'll do my best to be accommodating of any illness that interrupts your studies. There is no need to provide details of the illness. If you miss a week or more of work, please get in touch to make a plan for catching up. One of the biggest challenges in math is that once you fall behind, it's difficult to catch up on your own.

4. *What exactly does academic honesty mean?*

   In short, that any work you represent as your own, is your own. Much of your work can be done in groups, but not all of it. Using online tools like GeoGebra and Desmos is great, and something you might want to use in your own classroom some day.

   Use of these tools is acceptable, but take care that you are not overly reliant on them. What is not acceptable is having someone else do your work for you. This includes tutors, classmates, friends, family members, and online "homework help" sites. If someone else is doing your work for you, whether or not you're paying them, you are committing an academic offence.

   Penalties for academic dishonesty are outlined in the Academic Calendar. Depending on the severity of the offence, penalties for a first offence can range from a grade of zero on an assessment, to an F in the courses. Academic offences are also reported to the Dean of Arts & Sciences. They keep a record of each offence, and students with multiple offences can be subject to supplementary discipline.

5. *I missed a test! What do I do? Do I get a zero?*

   I will try to make alternate arrangements for any in class assessments you're unable to do in person. Just make sure you contact me ASAP to sort things out.

6. *Do I need a doctor's note?*

   No. This wastes health care resources and your time. (That was my answer before the pandemic, and it's doubly so now.) Just email me to say you were sick. However, if you miss more than one test due to illness, we'll need to meet to discuss how to adjust your grade.

7. *I receive learning accommodations. What arrangements can I make?*

   First, make sure that you have registered with the University's Accommodated Learning Centre. No need to let me know: they notify me of every student with accommodations.

   Some accommodations will look a bit different this year, but exam accommodations such as extra time are still possible.

   If there are any adjustments I can make to facilitate your learning, please do not hesitate to get in touch with me. All students deserve an equal opportunity to learn. Note that the HTML textbook is designed with accessibility in mind, and should work with screen readers. However, I regret that we have not had the time (or paid help) necessary to add elements such as alt-text descriptions for images. It's on the to-do list, but that list is long, and growing.

8. *Life intervened and I can't keep up this week. What do I do?*

   Send me an email. Extensions are usually granted as long as they're granted ahead of time. Online homework extensions need to be in place before solutions become available. Book an appointment with me as soon as you feel like you're falling behind and I'll do my best to get you up to speed.