Math 2090 Course Outline

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1 Essential Information

Course Instructor
Dr. Sean Fitzpatrick
Contact: via email[1]
Office: University Hall C540

Student Hours
Monday 1:00–3:00 pm, Tuesday and Thursday 2:00–3:30 pm, Friday 10:00 am – 12:00 pm, and Wednesday by appointment[2].

Course Website
via Moodle[3]

Course Textbook
Mathematics for Human Flourishing, by Francis Su.
We will have weekly readings from this book, which we will discuss on a forum provided in Moodle. You should be able to get the book in softcover for around $20, and you can rent it in audio book format from audible.com for $1 per month.
For mathematical content, we will refer to the book Mathematics for Elementary Teachers[4], by Michelle Manes. This book *is* a free OER textbook. You can access it online, and there is a PDF version available for offline access, or if you want to print portions of the book.

Class Meetings
Tuesday and Thursday from 10:30 – 11:45 am in SA 7212.
There is also a "tutorial" on Monday at 11:00 am in SA 7202.

Course Description
As per the Academic Calendar:

> Principles of Logic. Number Systems and Bases. Sets of real numbers: Integers, Rationals, Irrationals. Modular arithmetic and applications. Divisibility, primes, and elementary number theory.
>
> Prerequisite: Eight university-level courses (24.0 credit hours)

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[2] calendly.com/dr-sean-fitzpatrick
[3] moodle.uleth.ca
[4] pressbooks-dev.oer.hawaii.edu/math111/

2 Welcome!

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 Indigenous Peoples who attend the University of Lethbridge and the contributions these Indigenous Peoples have made in shaping and strengthening the University community in the past, present, and in the future.

Welcome to the course! 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. I want my classroom to be as inclusive as possible. If the "default settings" for the class don't work for you, please don't hesitate to ask for accommodation.

As usual, everything you need to know for the course will flow through our Moodle[1] learning management system. Make sure you check in regularly to keep on top of what's happening in the course.

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[2].

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.

4 Grading and Assessment

Math 2090 for Winter 2025 will be "ungraded". This doesn't mean there won't be assessments. (There will be plenty of those!) What it means is that the focus of my marking will be on feedback

[1] `moodle.uleth.ca`
[2] `uleth.ca/services-for-students/health-safety`

rather than a score. You will be responsible for tracking your effort throughout the semester, and for responding to the feedback you receive.

On quizzes and assignments, you will be asked to make corrections to any mistakes, and to write a short reflection on what you learned (including what you learned from your mistakes). You will need to collect your work, and these reflections, in a portfolio. At the end of the semester, we will review your portfolio together, and agree on a final grade. Typically, this will be the grade that *you* request, as long you're able to support your request with your portfolio. I reserve the right to refuse your requested grade if I don't think you've done the necessary work, or (what is more likely) I think you deserve a better grade than you've given yourself.

Below I have listed the different types of work expected in this course, along with guidelines on how you can assess your contributions.

Meetings. Each student will be expected to meet with me at least once during the semester to discuss their progress in the course, and again at the end of the semester to determine their final grade. These meetings are not technically assessments, but they are essential. A minimum requirement to pass the course is one midterm meeting, and one final meeting.

You are welcome to schedule additional meetings, either for guidance on your progress in the course, or to get help on course material, or just to discuss whatever else you feel like. For example, if you are not sure how to grade yourself on your quizzes or assignments, we can meet to go over your work to date.

Moodle forums. Each Moodle forum will be set up so that points are awarded. The points are strictly for you to be able to gauge your own progress in the course. Typically, an "A" student will earn over 90% of available points, a "B" student will earn 80-89% of available points, a "C" student will earn 70-79% of available points, a "D" student will earn 60-69% of available points, and a failing student will earn less than 60% of available points.

- *Weekly reflections.*

  There will be a journal forum on Moodle, where you will be asked to reflect on what was covered in class each week. Your entries are visible only to me. Typically I expect two or three reasonably thoughtful paragraphs. I will reply to each entry, and if I think you need to say more, I will prompt you to do so. Each journal entry earns 10 points, to a maximum of 100 points.

- *Reading forum.*

  The reading forum will be used for discussion of the book by Francis Su. You may find his website[1] useful for this, especially the list of 100 questions for discussion[2], which are organized by chapter.

  I generally expect each student to post one reflection per week, each from a different chapter. These reflections are visible to all students, and thoughtful/constructuve replies are encouraged.

  There will be a maximum of 200 points for the reading forum. Your initial reflection is worth up to 10 points, and replies are worth up to 5 points. (In some cases, especially good replies will earn 10 points.)

- *Sharing forum.*

  There will also be a general forum for asking questions and sharing information. In past versions of this course, students have found it useful to share resources they found online. If you find something you think will be interesting for others in the class, you should share a link to the resource, along with an explanation of why you found it useful.

  General discussion is worth up to 5 points, and a good sharing post is worth up to 10 points. The sharing forum will have a maximum of 100 points.

[1] `www.francissu.com/flourishing`
[2] `www.francissu.com/flourishing-discussion`

Quizzes and Assignments. These will cover the mathematical content in the course, and will be done in class. Your quizzes and assignments will not receive a numerical score. Instead, you will receive feedback on what needs to be improved/corrected. You will then write and submit a short reflection on the assessment and your feedback, as well as corrections to your work.

- *Quizzes.*

  Quizzes will take place during class, and will usually be fairly short. You will work on your own for 25—30 minutes. Following that, you will have an opportunity to discuss the quiz with your classmates before submitting anything to me.

- *Assignments.*

  Assignments can be done alone or in groups. You will have time to work on them in class, but you may need additional time outside of class.

For the purpose of self-assessment on your quiz and assignment work, please note that in this course, there should be no difference between getting everything right on the first try, and figuring it out once you've received feedback.

Every week, you can expect either a quiz or an assignment. Occasionally there might be one of each. In this category, A-level work consists of completing all assessments (excepting one or two missed due to illness), as well as corrections and a reflection once feedback is received. You should give yourself a lower grade if you miss several assessments, or if you do not put sufficient effort into completing the reflection and corrections.

Presentations and activities. A highlight of Math 2090 is seeing students present on topics, and even lead activities. (Past 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. Some presentation topics will be assigned. For example, we begin the course with a look at different numeration systems. I will present one example in class (Egyptian numerals), and other examples will be left up to you. In years where there is a critical mass of Education students, we have had students present on a grade level in the K-6 curriculum.

By the end of the semester, I expect each student to be involved in two or three presentations. They can be done individually, or with a group. After each presentation, I will ask those students not involved to provide me with feedback for the presenter(s).

From an A student, I would expect you at least two presentations, [3] and to support your peers by providing a good audience during the presentation, and constructive feedback after the presentation.

Final project and portfolio. Two items are due at the end of term: a final project, and the portfolio of your term work.

The final project can be considered optional, depending on your ambitions. If you've been doing "A" work all semester and want to make the case for an A+, you're going to want to do a project. If you've missed a few assessments during the semester and want to bolster your case for a better grade, you're going to want to do a project. If you're busy with other courses and mostly okay with where you're at, you can let the project slide.

A project could simply be an essay (around 8-10 pages, plus references), or it could be something more hands-on. Websites have been a popular choice in past years, and I've also received some great posters and infographics.

The main requirement for a project is that it demonstrates that you've made an effort to learn something extra, beyond what was covered in class. In lieu of a project, I am also willing to offer a final exam as an alternative.

Your portfolio should be a record of all your work over the semester, including your reflections on assessments. For example, it would be completely fine to totally tank your first attempt at a

[3] Either two presentations that demonstrate significant effort on your part, or three or more smaller-scale presentations.

quiz, but follow that attempt with corrections and a reflection that demonstrate that you learned from that experience. A good portfolio should tell a story of learning and growth throughout the semester.

Your portfolio should include one or two introductory pages in which you state what letter grade you are requesting, and then support your request with an outline your work. You can use this section to give a summary of your forum contributions rather than trying to include these in your portfolio. After the summary, please include a short write-up on each activity/ presentation you contributed to class, and then each of your quizzes and assignments, along with any associated corrections and reflections.

For this course, the ability to *avoid* mistakes is not important. What I want to see is that when you do make mistakes, you *learn* from them. You will use your reflections and your portfolio to provide evidence of this.

Your work for this course falls into three categories: forums, quizzes and assignments, and presentations. You should decide your base letter grade in each category based on the following guidelines:

- You should give yourself an A grade if you've done (almost) all the expected work, at a level of quality/effort that we agree is satisfactory.
- If you've fallen just short on doing the expected work, or you've done the work, but haven't consistently put in your best effort, you're probably at a B.
- A grade of C represents work that is good, but inconsistent.
- A grade of D or F should only apply when you've failed to complete significant portions of your work.

When it comes to deciding on "decorated" letter grades (such as C+ or A-), you should consider all three categories together:

- To earn an A+ grade, you need to have A level work in all three categories, and you also need to submit a final project.
- You can earn a B+ if your work is mostly at a B level, but you have one category where you've exceeded expectations for a B. (The same principle applies for a C+ or D+.)
- If your work is mostly at an A level, but you fall short in one category, a grade of A- would be appropriate. (The same applies for B- and C-.)

For any grade, if the grade you think you've earned is less than the grade you want, you can use a final project to boost your grade.

5 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[1]. 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[2]. 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.

[1] `www.uleth.ca/policy/resources/student-discipline-policy-academic-offences-undergraduate-students`
[2] `www.uleth.ca/ross/accommodated-learning-centre`

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.