



MATH 212: Fascinating World of Numbers (Fall 2026)

Instructor:	Dr. N. Lafrenière
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Office Hours:	_____
Important:	Students should get the above information from their instructor and from the course Moodle site. The instructor is the person to contact should there be any questions about the course.
Class Schedule:	Tuesdays & Thursdays, 10:15-11:30.

Reading Week

Begins on Saturday, October 10 and ends on Friday, October 16, 2026. No classes that week.

Objective

MATH 212: The Fascinating World of Numbers introduces students to the beauty, history, and real-world impact of mathematical ideas in an accessible and thought-provoking way. Designed for non-mathematics students and requiring no formal prerequisites, the course examines how mathematics shapes fields as diverse as art, architecture, music, commerce, technology, and the sciences. Students are exposed to intriguing mathematical concepts, famous unsolved problems, and the logic behind ideas that have influenced human thought for centuries.

Rather than focusing on technical computation, MATH 212 emphasizes critical thinking, curiosity, and an appreciation of mathematics as a creative and powerful human endeavor.

Topics can include:

- **Mathematical topics, such as:**
 - Numeration systems, types of numbers
 - Prime numbers
 - Exponential law
 - Golden ratio and the Fibonacci sequence
 - The art of making a conjecture, and famously unsolved problems
 - Some famous theorems, famous proofs and mathematical controversies

- **Applications, such as:**

- Patterns in architecture and nature, such as tilings, friezes and fractals
- Travel itinerary, through graph theory
- Games that are made possible due to some mathematical properties
- Rhythm sequences and music theory
- Voting systems
- Geometry and the ideas that made GPS possible
- Quantitative aspects of public health, such as mathematical testing and transmission of disease

Classroom expectations

A substantial part of the time in class will be devoted to active learning and discussion with your peers. Therefore, you are expected to attend class and to participate to the assigned activities. Students are expected to have a constructive and professional attitude throughout the course.

Grading

Your final grade will be composed of the following:

Component	Percentage
In-class quiz 1	10%
In-class quiz 2	10%
Participation	15%
Journal	15%
Oral presentations	20%
Final Exam	30%

Final exam and quizzes:

These will consist of a mix of essay-type questions and short-answer math questions. The quizzes and the final exam will have the same type of questions.

If you are unable to a quiz for a valid reason, you must write to your instructor to request to move the weight of the quiz to the other quiz. Such a request will not be granted unless it is made in writing (by email), the reason is valid, and is supported by documentation or other evidence. Valid reasons for missing a midterm test include: conflicts with other exams or religious observances (must be reported to the instructor in advance); illness ([Short-Term Absence form](#) required); and bereavement. The dates of the quizzes will be announced during the first week of class. The final exam will be scheduled by the Examinations Office. Students are responsible for finding out the date and time of the final exam once the schedule is posted by the Examination Office. Any conflicts or problems with the scheduling of the final exam must be reported directly to the Examination Office, not to your instructor. It is the Department's policy and the Examination Office's policy that students are to be available until the end of the final exam period. Conflicts due to travel plans will not be accommodated.

The **oral presentations** will be short presentations given to the class. The number of such presentations will depend on the number of enrolled students.

The **journal assignments** will consist of activities completed in class and short reflections on the material. A significant part of the grade is based on completion of the work and self-evaluation.

To receive credit for **participation**, students should attend class. If a student misses, at least in part, more than three lectures, the student will be penalized in their grade. Students should also demonstrate their commitment to group activities to receive full credit.

Course Material

The relevant material for this course will be posted on the Moodle site. There is no specific textbook attached to this course, although the following books will likely serve as a base to develop the course content. Specific references will be posted on the Moodle page.

- J. Ellenberg, *How not to be wrong: the power of mathematical thinking*. The Penguin Press, 2014.
- C. Pickover, *Wonders of numbers: adventures in mathematics, mind, and meaning*. Oxford University Press, 2001.
- G. E. Roberts, *From music to mathematics: exploring the connections*. Johns Hopkins University Press, 2016.

Disclaimer

As the course proceeds, it may be necessary to make minor changes to the course outline and to the content of the course to accommodate your special interests and needs. However, every effort will be made to minimize such changes. The course website is the official repository of the course material, and you should consult the site for all information relevant to the conduct of the course.

If there is any topic you would like to see covered in this class, please feel free to ask me about it. Every request for topics relevant to this class will be considered.

Student Services

You may wish to access the many services available to you as a Concordia student. An overview of these resources can be found here: <https://www.concordia.ca/students/services.html>

Academic Integrity and the Academic Code of Conduct

This course is governed by Concordia University's policies on Academic Integrity and the Academic Code of Conduct as set forth in the Undergraduate Calendar and the Graduate Calendar. Students are expected to familiarize themselves with these policies and conduct themselves accordingly. "Concordia University has several resources available to students to better understand and uphold academic integrity. Concordia's website on academic integrity can be found at the following address, which also includes links to each Faculty and the School of Graduate Studies: <https://www.concordia.ca/conduct/academic-integrity.html>" [Undergraduate Calendar, Sec 17.10.2]

Behaviour

All individuals participating in courses are expected to be professional and constructive throughout the course, including in their communications.

Concordia students are subject to the [Code of Rights and Responsibilities](#) which applies both when students are physically and virtually engaged in any University activity, including classes, seminars, meetings, etc. Students engaged in university activities must respect this Code when engaging with any members of the Concordia community, including faculty, staff, and students, whether such interactions are verbal or in writing, face to face or online/virtual. Failing to comply with the Code may result in charges and sanctions, as outlined in the Code.

Generative AI

The use of generative artificial intelligence tools or apps for assignments in this course, including tools like ChatGPT and other AI writing or coding assistants, is prohibited. You are encouraged to discuss assigned problems with classmates, but the submitted work must be your own.

Intellectual Property

Content belonging to instructors shared in online courses, including, but not limited to, online lectures, course notes, and video recordings of classes remain the intellectual property of the faculty member. It may not be distributed, published or broadcast, in whole or in part, without the express permission of the faculty member. Students are also forbidden to use their own means of recording any elements of an online class or lecture without express permission of the instructor. Any unauthorized sharing of course content may constitute a breach of the [Academic Code of Conduct](#) and/or the [Code of Rights and Responsibilities](#). As specified in the [Policy on Intellectual Property](#), the University does not claim any ownership of or interest in any student IP. All university members retain copyright over their work.

Use of Concordia email

Your [Concordia email](#) is the official channel for all university communications, as required by the university's [Policy on Concordia email accounts for students and employees](#). Please use your Concordia email for all communication related to this course and check it regularly so you don't miss important information. [Learn more about how to access your Concordia email](#).

As a student, you are expected to follow the email policy and to use your Concordia email in a respectful and responsible manner. The policy helps ensure that communication across the university is secure, reliable, and consistent.

Extraordinary circumstances

In the event of extraordinary circumstances and pursuant to the [Academic Regulations](#) the University may modify the delivery, content, structure, forum, location and/or evaluation scheme. In the event of such extraordinary circumstances, students will be informed of the change.