

**Northern Michigan University**  
**Mathematics and Computer Science Department**  
**MA555-50 (10615) Mathematics History and Technology (3 credits)**

**Instructor:** Dr. Carol Bell

**Office Phone:** (906) 227-1603

**Office Hours:** By appointment via Zoom; email me

**Office:** JXJ 2212

**email:** cbell@nmu.edu

**Prerequisite:** Graduate standing.

**Course Description (from NMU Bulletin):** The history and development of mathematics, and the newest technological innovations. Intended audience K-12 teachers.

**Course Objectives:** This course introduces a variety of historical and technological methods for doing mathematics, and helps students develop a broad understanding of the historical development of mathematics, including topics in systems of numeration, number concepts, arithmetic and algebra, geometry, number theory, and calculus.

**Texts and Other Requirements:**

- Berlinghoff, William P. & Gouvêa, Fernando Q. *Math through the Ages: A Gentle History for Teachers and Others*. Expanded 2<sup>nd</sup> Edition. MAA Press. (ISBN: 978-1-93951-212-3)
- Burton, David M. *The History of Mathematics: An Introduction*. Sixth Edition. New York: McGraw Hill, 2011. (pdf version available in EduCat)
- A scientific calculator and The Geometer's Sketchpad for solving some of the problems.

**Learning Outcomes:**

Upon successful completion of this course, a student should be able to:

1. Describe the development of various areas in mathematics within and across various civilizations;
2. Discuss the effects of cultural backgrounds of individuals on their contributions to mathematics;
3. Discuss the contributions of women in the history of mathematics;
4. Explain historically significant theorems and their applications of mathematics;
5. Apply historical and modern techniques, including utilizing technology to solve problems.

Evaluation of these learning outcomes done through class discussions, homework, and tests.

**Required Technical Skills:**

This online course uses both EduCat and publisher materials. I recommend that you use Chrome, Firefox, or Safari to access the links in EduCat to various web sites with videos, practice problems, or other information for you to read. Please note that some of the resources may not have learner accessibility, such as a closed caption option on the

videos so please let me know if you need an alternative means to access the course materials. Below is a list of technical skills you should have.

- 1) Log in to your EduCat account (<https://educat.nmu.edu/>) and access course materials provided in EduCat.
- 2) Scan your written work using a PDF scanner on your phone. Recommended PDF scanners include, TurboScan, Genius Scan, and CamScanner (iphone only).
- 3) Use email with attachments.
- 4) Use Zoom or another video conferencing application.
  - You can download Zoom from <https://support.zoom.us/hc/en-us/articles/201362233-Where-Do-I-Download-The-Latest-Version->.
- 5) Capture work on your screen using the PrtSc key or some program (only necessary if you have questions on work done on your screen that you need to send me).
  - Windows instruction video (<https://www.youtube.com/watch?v=sPpYhwdYIes>)
    - Note my PrtSc key is located in the lower right part of the keyboard.
  - Mac instructions (<http://www.printscreenmac.com/>)
- 6) Know how to use one of the geometry programs: The Geometer's Sketchpad, GeoGebra, or Desmos (geometry).

**Assessment Format:** Specific information on each assessment is below.

- **Homework (40%):** Each week you will complete a written homework assignment on the assigned chapters/sketches in the text. You should read the sketches and other readings noted prior to attempting the homework. There are examples of some of the concepts in EduCat. There are six homework assignments with each one worth 20 points. You must upload your written work to EduCat. Please use a PDF scanner, such as TurboScan, Genius Scan, or CamScanner (iphones). The scanner allows you to take photos of your work and save them as a single PDF file.
- **Class Discussions (40%):** There are six class discussions in EduCat, which provide you with the opportunity to interact with your classmates. I will also participate in the class discussion by providing comments to individuals or the class as a whole. The discussion questions will help you solidify your knowledge of unit concepts. In some cases, you will be required to do additional research prior to providing an initial response. Once you post a response to the discussion question(s), you will see other students' responses (in 30 minutes) and must then provide a response to other students' postings according to the directions in the assignment (generally, one or two other students). Each class discussion is worth 20 points (15 points for your initial posting; 5 points for responses to other students' postings). I will grade you on the correctness and completeness of your initial posting and quality of your responses. Comments such as "good job" or "I agree" will not give you points toward responding to others' postings. Provide relevant or helpful feedback to your classmates.
- **Final Exam (20%):** There is a comprehensive final exam in EduCat. It will test your knowledge of mathematicians throughout history and their contributions to mathematics, and a variety of mathematics concepts you learned during the course. It consists of 20

questions that are multiple choice, matching, drag and drop, or short answer calculations. It is a total of 40 points. You will access it in EduCat on the scheduled date of the test, which is **Monday, April 26**. You may take it any time between the hours of 7:00 am and 11:00 pm. You have one hour to take the test.

**Is there extra credit in the class?**

YES! Complete the course evaluation during the last week of classes. You can access it via EduCat. If at least 90% of the class completes the course evaluation, I will add 0.5% to your final course percentage at the end of the term.

**Grading Scale (%):** Your course grade will be weighted according to the percentages outlined under Assessment Format. Corresponding grades are below.

100 – 93.0: A	86.4 – 82.5: B	76.4 – 72.5: C	66.4 – 62.5: D
92.9 – 89.5: A-	82.4 – 79.5: B-	72.4 – 69.5: C-	62.4 – 59.5: D-
89.4 – 86.5: B+	79.4 – 76.5: C+	69.4 – 66.5: D+	59.4 – 0: F

**How much time should you spend each day on the class?**

You should set aside 2 – 4 hours each day to learn the concepts and complete the assignments. Follow the calendar to keep up with the work. Know the deadlines! You should plan for 1 – 2 hours to read each section in the text and view the worked examples. You will then likely spend 1 – 2 hours completing the homework.

**How do I get help in the class?**

- 1) Set up an appointment to meet via Zoom.
- 2) I encourage you to work with other students so you can help each other.

**NMU’s Non-Discrimination Statement:**

Northern Michigan University does not unlawfully discriminate on the basis of race, color, religion, sex, national origin, age, height, weight, marital status, familial status, handicap/disability, sexual orientation, or veteran status in employment or the provision of services, and provides, upon request, reasonable accommodation including auxiliary aids and services necessary to afford individuals with disabilities an equal opportunity to participate in all programs and activities.

Anyone having civil rights inquiries may contact the Equal Opportunity Office, 502 Cohodas Hall, telephone number 906-227-2420.

**Disability Services:**

If you have a need for disability-related accommodations or services, please inform the Coordinator of Disability Services (227-1737 or [disserv@nmu.edu](mailto:disserv@nmu.edu)). Reasonable and effective accommodations and services will be provided to students if requests are made in a timely manner, with appropriate documentation, in accordance with federal, state, and University guidelines.

**Email Etiquette Tips:**

Did you know NMU provides email etiquette tips at <https://www.nmu.edu/etrpc/email-etiquette>? Please be respectful in all your correspondence with me or other students. This includes email, postings made on Discussion Forums, or any other forms of communication. **Please tell me what class you are in when you email me.** Additional information about NMU's expectations, acceptable standards of behavior, and procedures are in the Student Handbook at <https://www.nmu.edu/dso/studenthandbook>.

**Good Email Example:**

Hi Dr. Bell,

I am in your mathematics history class. I have a question on problem 2 in this week's homework. Are you available to meet via Zoom on Wednesday between the hours of 3:00 pm and 7:00 pm. Thank you.

Your Name

**Need Technical Support?**

NMU IT Services – <http://it.nmu.edu/helpdesk>

**NMU IT Support****NMU HelpDesk**

The HelpDesk is committed to providing the highest level of quality support to NMU students, faculty, and staff. Support is provided for NMU network connections, network services, and NMU issued software and computers, including TLC notebooks. Limited support for other systems may be provided or referred to other service providers on campus as available. Help is available via email, telephone, walk-in service and the IT/Helpdesk Web site.

- Location: LRC 116
- Phone: (906) 227-2468
- Email: [helpdesk@nmu.edu](mailto:helpdesk@nmu.edu)

**NMU Micro Repair**

Provides hardware support for NMU students, faculty, and staff.

- Location: LRC 114
- Phone: (906) 227-1192

**Winter 2021 Schedule**

Winter 2021

MA555 Mathematics History and Technology

Unit	Dates	Read	Assignments	Due
<b>1</b>	03/08 - 03/15	Read: The History of Mathematics in a Large Nutshell		Mon. Mar 15
		Sketches 1-3	Discussion Forum 1 in EduCat	Sat. Mar 13
			Homework 1	Mon. Mar 15
<b>2</b>	03/16 - 03/22	Sketches 4-6	Discussion Forum 2 in EduCat	Sun. Mar 21
		Burton, Sections 2.1-2.2	Homework 2	Mon. Mar 22
<b>3</b>	03/23 - 03/30	Sketches 7, 29	Discussion Forum 3 in EduCat	Mon. Mar 29
			Homework 3	Tues. Mar 30
<b>4</b>	03/31 - 04/08	Sketches 8-10	Discussion Forum 4 in EduCat	Wed. Apr 7
		Burton, Sections 2.3, 2.5	Homework 4	Thurs. Apr 8
<b>5</b>	04/09 - 04/16	Sketches 12-13	Discussion Forum 5 in EduCat	Thurs. Apr 15
		Burton, Section 3.2	Homework 5	Fri. Apr 16
<b>6</b>	04/17 - 04/23	Sketch 30	Discussion Forum 6 in EduCat	Fri. Apr 23
			Homework 6	Fri. Apr 23
	04/24 - 04/26		<b>Final Exam in EduCat</b>	<b>Mon. April 26</b>