

**MATH 429**

**History of Mathematics**

**Spring 2019**

**Pre-Requisite:** Math 307  
**Time:** MWF 12.00 – 12:50  
**Place:** Math 103  
**Instructor:** Dr. Sriraman  
**Office:** Math 310  
**Office Hours:** MW: 10.00-10.50  
**Phone & E-mail:** 243-6714; sriramanb@mso.umt.edu  
**Texts:** Some recommended texts are:

Stillwell, J. (2010). *Mathematics and Its History* (Third Edition). Springer Science.

Joseph, G. G. (2011). *The Crest of the Peacock: Non-European Roots of Mathematics*. Princeton University Press.

**Webpage:** UM-Online Moodle will be used (please check Moodle every week).

**Learning Goals**

1. To imbue a sense of the development of mathematical ideas over time.
2. To develop a knowledge of the times and places where ideas developed, and the ways in which such ideas were transmitted across cultures and time.
3. To learn about the people behind mathematics that is taught today, and to understand the contributions of other cultures to mathematics.
4. To improve the students ability to write in the context of mathematics; i.e., expository and scientific writing skills.

To further the learning outcomes over the course of the semester, lectures and readings will cover

- Historical techniques/methods for computing trigonometric functions and original series representations.
- algebra (closed solution of the cubic and quartic using Tschirnhaus transformations), analysis (approximating roots and irrational numbers such as  $\pi$  and logarithms), and Calculus (finite differences, geometric techniques developed by Archimedes, Fermat, Newton and Leibniz).
- Assignments that involve expository and scientific writing skills

In addition students will develop a critical stance in

- assessing popular myths about mathematics (science) or competing histories of the origins and/or models of the development of mathematics (science)
- assessing whether mathematics (science) is value-free; [consider gender, class, race, nonwestern approaches and contributions, etc.]

Note: The course satisfies the upper-division writing requirement for Math majors.

**Important Dates:** (For detailed Add/Drop dates, Spring deadlines, refer to the last page of this syllabus)

<b>January 10, 2019</b>	Spring classes begin
<b>January 21, 2019</b>	Martin Luther King Jr. Day – no classes
<b>February 18, 2019</b>	President’s Day Holiday – no classes, offices closed
<b>March 25 – 29, 2019</b>	Spring Break – no classes
<b>April 26, 2019</b>	Last instructional day of Spring
<b>April 29 – May3, 2019</b>	Spring Final Examinations

Other Information: *Academic misconduct* is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. Academic misconduct is defined as all forms of academic dishonesty and the Student Conduct Code. In particular, Student Conduct Code Section IV.a.5 identifies the following violations: Submitting false information: Knowingly submitting false, altered, or invented information, data, quotations, citations, or documentation in connection with an academic exercise

*Students with disabilities* may request reasonable modifications by contacting me. The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and Disability Services for Students (DSS). “Reasonable” means the University permits no fundamental alterations of academic standards or retroactive modifications. For more information, please consult <http://www.umt.edu/disability>

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**Grading Distribution:**

In class Contributions (Ted Talk 1, Ted Talk2)	80
2 Formative Writing Assignments:	80
1 Mid-term:	80
Research Paper	160

**Total:** 400

**Grading Scale:** 90-100 A ; 80-89.9 B ; 70-79.9 C ; 60-69.9 D ; Below 60 F

**In class contributions (Reading 1-Ted Talk 1; Reading 2- Ted Talk 2)**

In order to succeed in this course, it is important to complete the reading assignments and come to class prepared. There will be 2 targeted readings assigned to you [to be determined]. For each reading, you will do the following:

- A. Reading 1- Prepare a summary for the class with several “specific” questions for discussion. The summary will be typed and include the relevant history [and time period], the relevant individual(s) and the relevant mathematics (with attention to specific techniques). The summary will be approximately 2-3 pages [single spaced], Font size 12 Times New Roman, 1 inch margins.
- B. Ted Talk 1- Three individuals will be assigned to a group [Yes- the class will also have presumably read your selections]. Each person will take 5-8 minutes to present their summary and then the group will lead the class discussion  
This will occur in February
- C. Reading 2- A 2-3 page summary (same specs as A) will be prepared for the class-typed and include the relevant history [and time period], the relevant individual(s) and the relevant mathematics (with attention to specific techniques).
- D. Ted Talk 2- Each person will give a 15-20 minute Ted Talk in which you will be required to present specific techniques from reading 2. This can include presenting/solving problems using the relevant mathematical technique learned from the reading.  
This will occur in March

**Formative Writing Assignments**

The only way to become proficient at expository scientific writing is to write and rewrite and rewrite until your ideas become coherent and accessible to the reader. Writing in the mathematics community is a necessary activity, one in which ideas are subjected to scrutiny in the form of peer-review. This may seem intimidating at first but with time, you will become comfortable and proficient. The two formative writing assignments are as follows:

1. A 1000 word biography of a 20<sup>th</sup> century female mathematician (other than Emmy Noether). Due Jan. 25th
2. An obituary of a non-Western mathematician. Please refer to the Washington Post or the New York Times or The Economist for guidance in writing. Use one as your model and turn it in with your own work. (1000 words). Due February 15th

**Mid-term**

A mid-term will be given in early April. It will cover the content from the lectures.

**Research Paper**

The research paper is a major component of this course. The paper should be written in APA style [6<sup>th</sup> edition or higher]. Please refer to the appropriate manual for guidelines. All papers must be typed and submitted both in paper and electronically as a word document. You will have the opportunity to rewrite your paper two times provided you adhere to the deadlines. The point of submitting earlier drafts is for you to receive feedback in improving your writing. Papers that are submitted on the due date, without any prior feedback from me will receive a 20% deduction.

The history of a mathematics topic should be chosen from a list that I will provide to you (the list will exclude histories of zero, infinity,  $\pi$ , e and phi (the golden ratio), the Newton/Leibniz controversy). The paper will focus on (a) tracing the evolution of a topic across time, or (b) it can be a period piece that focuses on the development of a mathematical topic or area, and puts it in the context of the period of its development. The final paper should include appropriate events in the world of mathematics during that time, some of the cultural history of the time period, and specific mathematical content/techniques developed. The final paper should be around 5000 words.

Due dates are as follows: first draft- February 1 (approx. 2000 words), second draft- March 1 (approx. 3500 words), and final draft April 18 (approx. 5000 words). Grading Criteria will be provided.

Important Notes

### **SOME “FREE” ADVICE**

*Factors that affect your grade*

- Readings/Lecture notes: It is your prerogative to keep up with the material.
- Attendance: Students are expected to attend class, and although class attendance is NOT a component of the course grade, absences will impact your performance since you will miss the material covered in the lectures. Late assignments will NOT be accepted.
- Make-ups: THERE ARE NO MAKE-UPS regardless of the reason. Exam make-ups will ONLY be given under special and extenuating circumstances, such as a death in the family or illness, provided that a note from the Health Service or doctor is furnished by the student AND permission is given by me prior to the exam.
- This class is a lecture-discussion class and an upper division writing class. Your grade therefore depends on attendance and participation in class, and also depends on your completing the readings in the books, your work on in-class assignments, and finally your research and writing for your papers. Come to class, work hard, participate in the planned activities, and you will do well in this course. Good luck and welcome to 429.