Mathematics and World Culture

Instructor: Dr. Cathy D’Ortona

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Office hours: TBD

Credits: 3

Class time: Online
Class location: Online

Texts: Mathematics across Cultures: The History of Non-Western Mathematics by Ubiratan D’Ambrosio
The Crest of the Peacock: Non-European Roots of Mathematics by George Joseph
Mathematics for Non-Mathematicians by Morris Kline
Journey through Genius: the Great Theorems of Mathematics by William Dunham

Course Content and Purpose: In this course we will read, discuss, and write about mathematics, mathematicians, and their roles in societies around the world. Unlike many other courses offered by the department; it is not designed to develop mathematical skills, per se. Instead, we will try to gain a better understanding of what mathematics is, how it echoes and relates to the societies that develop it, and why it is important to all members of these societies. In the process, we will often discuss issues in the fields of history, science, and philosophy. You are encouraged to ask questions and bring whatever outside knowledge you have to our discussions.

Course Outcomes: Students completing this course are expected to:

- Demonstrate an awareness of the impact of mathematical developments on society at large.
- Demonstrate ability to communicate mathematical ideas in writing.
- Demonstrate a basic understanding of logic and axiomatic reasoning.
- Demonstrate an awareness of the wide variety of people and concepts that fall under the terms “mathematicians” and “mathematics.”
- Demonstrate an understanding of some of the forces that have motivated and guided mathematical development through the ages and around the world.
- Demonstrate the ability to explain interactions of cultures as reflected in the mathematics those cultures.
- Demonstrate the ability to describe the issues, opportunities, and challenges brought about by the increasing globalization of mathematics.
- Demonstrate the ability to describe and begin to evaluate their own cultural perspectives and biases, as related to the historical development of mathematics.

Grading: Your course grade will be based on the following percentages.

- Quizzes: 20%
- Short writing assignments: 20%
- Longer writing assignments: 20%
- Midterm: 20%
- Final: 20%

Attendance: Since this is an online course, “attendance” becomes a matter of participation in and completion of the various assignments in a timely manner. To do well in the course, you must keep up with it on a regular basis.

If you have a reason for missing an assignment or assessment due date that would qualify as an excused absence in a face-to-face course, then you should contact me as soon as possible to arrange to make up the assignment or assessment. The official MU Policy appears below, as required.
Mansfield University Absence Policy & Procedure: If a student must miss a class due to documented illness or other excusable reason, the student must:

- inform the faculty member that a written excuse is coming from a physician, coach or other authority prior to the absence if possible, but no later than the first class period after the excused absence;
- provide each faculty member with a copy of the signed excuse; (The original must be available for faculty review.)
- make up missed graded assignments or exams as soon as possible as outlined by the faculty member. In order to avoid prolonged delay of make-up of the work, a faculty member may, at her/his discretion, give the make-up work and hold it for grading until after the written excuse is received.

Reading and Discussion: You will do a great deal of reading (as compared to other math classes) in this course. (On the other hand, you will have no problem sets to do.) It is important that you read the assigned selections, take notes on what you have read, reflect on the readings, and discuss the material with others. I will post daily “class notes” that reflect, in part, classroom discussions from previous face-to-face offerings of this course; I strongly encourage you to discuss the readings with each other. It is important that you understand that skimming the readings is not sufficient. You need to take the time to take good notes and really think about what you have read so that you are prepared to discuss the readings in class.

Testing: There will be weekly quizzes, a midterm, and a final exam. Open-book tests have their own difficulties. There is a large volume of material. You cannot expect to have time on a quiz or exam to look up the answer to every question. The questions I ask will be on the most important points of the reading, and you should be able to answer a fair number of them on your own. You may find it helpful to take notes on your reading.

Testing will be done online in the D2L environment. Each assessment will be time-limited in both senses. (That is, there will be a limited window when the quiz or exam is available to be taken and also a limited amount of time that you can actually spend working on the quiz once you start. Details will be given on D2L.)

Writing: Writing will be a significant part of the course. Writing assignments should be submitted to D2L drop boxes and will include:

A definition of mathematics
A "mathematical autobiography" (1 – 2 pages)
Two “biographical sketches” – a form will be provided.
Other short writing projects
Essay questions on the exams
Three longer papers as listed below. Regardless of your numerical average, you must turn in at least two of these three papers in order to pass the course.

<table>
<thead>
<tr>
<th>Paper</th>
<th>Due</th>
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<tbody>
<tr>
<td>Paper #1</td>
<td>2/15</td>
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<tr>
<td>Part 1 (75 points)</td>
<td>3/31</td>
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<tr>
<td>Part 2 (50 points)</td>
<td>4/14</td>
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The first paper should be a discussion of the mathematics of a particular period or culture (e.g., Mathematics of the Renaissance, Chinese Mathematics), or of the development of a particular branch of mathematics (e.g., Geometry, Statistics), or of applications of mathematics to a particular field (e.g., Mathematics of Art, Mathematics in Education). The second paper begins with a comparison of how some aspect of mathematics was developed in two different times or places. Part 2 of the paper will be a response to the comparison submitted by another student. A choice of topics will be provided. Detailed descriptions of all the papers are available on D2L.
Web Source Policy: You may not use “Wikipedia” for papers in this course. “Wikipedia” is an open-source site. This means that anyone can add information to entries there. Thus, the potential for finding rumor and hearsay reported as fact is even greater there than is usual on the web. By extension, you may not use any other open-source sites, as well.

For papers where the number of Internet sources is limited: If you find journal articles or full-text books or chapters via a web search, those sources count as articles or books, not as Internet sources. The librarians can assist you in finding such high-quality online sources.

Intellectual Honesty: Your three long writing assignments will be submitted on D2L through Turnitin. This is a package that checks submitted papers for text-matches to other sources, including previously submitted papers. If a paper is flagged as having a high percentage of material that matches other sources, I check carefully to determine what the cause of the matches may be. If properly formatted, quotations and bibliographic material will not be flagged, but I do check for formatting issues and other possible innocent explanations. However…

Because you will be doing research papers for this class, it is important that you have a clear understanding of proper documentation. I do expect you to reference your sources (for both direct quotes and paraphrased material). For your citations, you may use parenthetical references in the body of the text, footnotes, or endnotes. (If you use parenthetical references, you should designate a short name for each website to be used in place of the author’s name if the website does not list one. Do not use the entire web address for each reference! The entire web address should appear on your bibliography page, along with an indication of the short name you used for your citations and the date you accessed the page.)

Correct citations will be easier if you take notes as you read and note the source (including page number) for the information as you take the notes. That way you don't have to hunt back through your sources once you decide what material will end up in the final paper. I find it helpful to take notes verbatim (word-for-word). Then when I write the paper I can paraphrase without fear of accidentally reverting to the original wording. You may use any standard format for your references that you choose – MLA and APA styles are most common.

As a rule of thumb, you should have a citation for any information you did not know before you began your research. For the first two papers for this class, that will most likely mean at least one citation per paragraph for essentially the whole paper. (If all the information in a paragraph came from the same source, one citation at the end is sufficient. If several successive paragraphs came from the same source, each paragraph should still have its own citation.)

Remember: If you put the information in your own words (which you should do as much as possible), a citation is required. If you are quoting, a citation is required and you must also show that you are quoting by using quotation marks or an accepted long-quote format. Please note that the citation itself is not part of the quotation.

If you have any doubts whatsoever about the way you are citing your sources, check with me or one of the people at the Writing Center to be sure you are doing it correctly. Once your paper is turned in, ignorance of the rules is not an acceptable excuse.

The first time you turn in a paper with unacceptable citations, it will be returned to be rewritten and resubmitted. You will receive no grade until you do so, and your paper will be penalized for being late. If you do it a second time, academic dishonesty papers will be filed with the Provost’s Office.
On D2L, under the Assignments link, I have provided you with a statement about intellectual honesty. You are required to copy it out by hand and submit it to me. This can be done in person, by mail, by FAX, or by emailing a scanned copy. The purpose of this assignment is to guarantee that you are aware of these policies.

**Cultural Diversity:** Mathematics as a body of knowledge is the culmination of efforts by many people from many cultures over several millennia. The contributions of individuals of different cultures, races, genders, and creeds are all important and, indeed, are the main focus of this course. While the approaches to mathematics vary widely in these different settings, the mathematics itself transcends all of these human divisions.

**Exceptionalities:** Students with documented learning disabilities, physical challenges, or other significant medical conditions that may affect their learning in this course should meet with the University’s Disability Advisor in the Department of Academic and Human Development (141 South Hall, Phone: 662-4436) as soon as possible. The Disability Advisor will arrange to provide your professors with an appropriate letter so that we may serve your particular needs more effectively. If you have a disability that requires classroom or testing accommodations, the advisor will also clarify appropriate arrangements.

The Counseling Center is also an excellent resource for any student who is dealing with personal or family issues or simply having difficulty adjusting to college life. The counselors there are highly skilled professionals who are experienced in the ways a student’s personal and academic issues can interact. Your student activity fees have already paid for this resource to be available to you. Please don’t hesitate to contact the Counseling Center if you need help or advice. I will be happy to help you set up an appointment if you would like me to do so.

**List of Topics**

(Note – the syllabus presented to the students will have this section refined with a week-by-week schedule of topics, also incorporating assignment due dates.)

1. Mathematics of the Ancient Mediterranean (Egypt and Babylonia)
2. Mathematics of Ancient China and Japan
3. Mathematics of the Pre-Columbian Americas (Incas and Mayans)
4. Mathematics of the Arab Empire
5. Mathematics of India
6. Mathematics of Renaissance Europe
7. Modern (International) Mathematics, including Mathematics in the United States
8. Women in Mathematics