

Math 195 – Ethnomathematics

Kevin Hartshorn – Fall 2007

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Vital Information

Class Meeting

MWF 7:50am – 8:40am
PPHAC 235

Common Text

At this point, there is no required text. Our readings will come from handouts and individual research.

Other Materials

We will make regular use of articles from the library and the web.

You will need a binder specifically for this course to hold your notes, reflections, and articles.

Contact Information

Office

PPHAC 215

Office hours

Mon, Wed 9:00–10:00am
Wed, Thu 2:00–3:00pm

e-mail

hartshorn@moravian.edu

Class Web-page

<http://www.math.moravian.edu/hartshorn/math195>

Description of Course

Over the past several decades, there has been a growing recognition nationwide of the need to study the mathematics used by non-western societies. By studying different numbering systems and geometric patterns, we gain a better understanding of relationships between societies. An examination of accounting systems (such as the quipu of Inca society) and computation methods demonstrate how power within societies has been maintained. By learning more about the mathematics of other cultures, we gain an appreciation of the impact of cultural values on the nature of mathematics as well as the impact of mathematics on the evolution of society. In particular, we begin to see a much broader definition of what mathematics really is and the tremendous impact it has on our own lives.

This course is meant to fulfill the the M5 interdisciplinary requirement. As such, there is no prerequisite for the course other than a standard high school mathematics curriculum. The mathematics used in this course should be accessible to the general collegiate audience, and the topics for the course will be focusing on the social aspects of mathematics around the world.

Goals and Objectives

As an M5 course, this course is meant to study of a major global issues (mathematics) and the ways that cultural differences shape the perceptions and responses of different societies to that issues. Attention will be paid to the ways that differences in power both between societies and within societies shape the global community's response to the use and nature of mathematics.

Goals for this course based on the LinC curriculum will include:

- Developing an enhanced appreciation of the effect of cultural values (including our own) on the perceptions with which different peoples view the role and nature of mathematics,
- Increasing awareness of the complexity of the nature of mathamatic and its connections to various aspects of society,
- Improving our understanding of the ways that power differences shape (a) peoples' understanding of the nature of, and (b) their assessment of the significance of, mathematics.

More specific to this course, I expect that

- Students will begin to develop connections between different cultures, including their own, through the lens of mathematical thinking.
 - Students will begin to identify the distinction between intrinsic mathematical thinking within a culture and imposed mathematical structure on a cultural activity.
 - Students will recognize the complexity of the interplay between mathematics and a society's effort to reach an understanding of nature.
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Grading Policy

For most writing and participation assessment, I will use a check-mark system. Generally a check (✓) can be interpreted as a “B” (defined in the student handbook as “evidence of independent work and original thinking”). A check-plus (✓+) can be interpreted as an “A” (defined as “achievement of the highest caliber”). A check-minus (✓-) indicates roughly a “D” (defined as “unsatisfactory work, below the standards expected by the college”). If a more detailed grade is merited, I shall use the 4-point scale as defined on page 46 of the Moravian College Course Catalogue. To determine your numeric grade at the end of the course, I will use the following distribution:

- 25% *Journal reflections and written assignments*
These will be graded using the check-mark notation
 - 25% *Class participation*
While showing up is half the work, you will get full marks only with active participation (regularly engaging in class discussions and activities).
 - 25% *Research project*
This project will be divided into smaller portions (pre-writing, prospectus reports, revision of drafts, etc.). The final product is just one small part of this grade.
 - 25% *Course Notebook*
A compilation of the work you have put into the course, with annotations and reflective writing to summarize your observations on the semester.
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Reading and writing

Success in this course relies on all of us coming to class prepared. To that end, there will be regularly assigned readings (selections from books, papers, articles available on the web, etc.).

I will provide worksheets guiding you through the readings, and there will regular writing assignments (journals) that will provide the opportunity to reflect and process the new information in the class.

Attendance and Participation

You will not learn the material if you do not come to class. You are expected to attend and actively participate in each class meeting. By active participation, I am looking for:

- evidence that you have been actively reading and keeping up with the assignments,
- well-considered questions based on the readings, and responses to questions posed by other students and myself,
- polite, but honest, feedback to presentations given in class.

For each day of class, you will get a 0, ✓-, ✓, or ✓+ for both your journal entry and your class participation (if you have an excused absence, you will not get any mark). By default, you can expect a ✓ for each, reflecting that you have essentially met expectations.

While I expect you to attend every session, unavoidable situations may arise during the semester. Thus I will allow each student up to 3 absences, excuses or unexcused. In addition, you may miss as many as 3 additional classes with an appropriate excuse. Absences beyond will incur a penalty to your course grade.

If you know you will be missing class, let me know as soon as possible (before the class you will miss) so that special arrangements need to be made. If I am given sufficient notice, I might be able to indicate readings you might do to help keep up with the work in the class.

If you miss class for an unforeseen reason (sudden illness, car breakdown, etc.), send me e-mail (hartshorn@moravian.edu) as soon as possible. Generally if you miss a class for a legitimate reason (as determined by me), I can help ensure that you can make up any work miss and are not unfairly penalized.

You have sole responsibility for all work and information you may miss by not attending class, regardless the reason. As a general principle, I do not allow make-up work.

Research Project

Everyone will be asked to choose a particular example of ethnomathematics for deeper study. You may choose a particular mathematical idea to explore across several cultures, or a particular culture to explore a range of mathematical ideas. The research project is meant to help foster independent learning, as well as giving everyone an opportunity to pursue a topic of their own choosing.

Students will need to conduct independent research (information about how to use the Reeves resources will be provided), give a short presentation, and write a report on their findings. This portion of your course grade will be based on the various stages of your research: topic generation, initial research, prewriting activities, research prospectus, initial draft(s), class presentation, and final draft.

Details on the research project, including parameters for the length and scope, will be provided in a separate handout.

Course Notebook

Everyone needs a notebook dedicated to this course. I strongly recommend a 3-ring binder, as you will be regularly adding papers and written assignments to the notebook. Your notebook should be divided into 4 sections:

- Reflections and writing assignments
- Annotated readings and handouts
- Classroom notes and in-class activities
- Reports on videos, lectures, or other activities.

From time to time, I will collect the notebooks to check your progress. Near the end of the semester, you will need to submit your notebook with several reflective essays. Details on this will be provided later.

Course Content

Note that this is a broad outline meant to give you a sense of where we are heading in this course. It is subject to change depending on the progress of the course. I have deliberately included overlap in this outline to emphasize the fluid nature of the course outline.

- *Weeks 1–3: Introductory material*
General articles will help us to understand the general nature of ethnomathematics, terms commonly encountered, the types of questions addressed, and common pitfalls in ethnomathematical research.
 - *Weeks 2–6: Background mathematics*
We will explore various mathematical ideas (counting systems, calendars, basic mathematical concepts). This is partly meant as a first look at the mathematics of other cultures and partly as a means to brush up on forgotten mathematics.
 - *Weeks 5–12: Case studies*
Utilizing sources such as *Mathematics Elsewhere* and *Ethnomathematics* (both by Marcia Ascher), we shall look more carefully at several specific examples of ethnomathematical discovery.
 - *Weeks 10–15: Independent research*
Everyone will be asked to complete a short report on one topic of their choosing. Details on this will be provided near the middle of the semester.
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Course Structure

Much of this course will be spent reading, reflecting, and discussing articles regarding ethnomathematics. In particular, I plan on the following cycle of activity:

- Everyone reads the assigned reading, then completes a short reflective journal to help internalize the material.
 - In class, we discuss the ideas presented and how they fit within the larger picture we are developing.
 - From time to time, more comprehensive writings will help synthesize the material for disparate sources.
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Academic Honesty

Students will be expected to adhere to the standard of the Academic Honesty policy as described in the Student Handbook (pages 51-53). Any violations of this will result in severe penalties on the assignment, a report to the Dean, and the very real possibility of failing the course.

Note that you are welcome to discuss the readings with classmates, including questions posed on the reading guides. However, the journal responses to the readings must be your own. Each reflection on the reading should be an individual effort.

Last Notes

- Visit my office! I would love to help address individual issues or answer questions you have about the course. I would love to hear feedback about which aspects of the course are or are not going well. You have a great deal of power to determine the path this class takes – take advantage of it. You can also communicate with me via e-mail (hartshorn@moravian.edu). Drop me a line and let me know how the course is going.
- This syllabus is subject to change through the semester. The most recent version of the syllabus can be found at <http://www.math.moravian.edu/hartshorn/math195/>.
- Final determination of your course grade is subject to my discretion as professor of the course.