

Math 195 – Ethnomathematics

Kevin Hartshorn – Fall 2008

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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 a major global issue (mathematics) and the ways that cultural differences shape the perceptions and responses of different societies to that issue. 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 mathematics 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 be able to apply mathematical analysis to a new cultural activity, applying their mathematical knowledge to provide insight into the activity.
- Students will identify mathematical thinking in cultural activities, analyzing the intentionality of the mathematics within the activity in the context of ethnomathematical research.
- Students will be able to discuss both the social connections and the skill-driven goals in a new mathematics lesson, activity, or educational article.

Core Information

Class Meeting

TTh 8:50am – 10:00am
PPHAC 232

Common Text

The main text for this course will be *Ethnomathematics: Challenging Eurocentrism*, Powell and Frankenstein (editors)

It is available as an e-book through Reeves library.

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

MWTh 1:30pm-3:00am
or by appointment

e-mail

hartshorn@math.moravian.edu

Class Web page

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

<http://blackboard.moravian.edu>

Course Content

Much of this course will be spent reading, reflecting, and discussing articles regarding ethnomathematics using the following cycle of activity:

- Everyone reads the assigned reading, then participates in the on-line message board to help internalize the material.
- In class, we discuss the ideas presented and how they fit within the larger picture we are developing.
- More comprehensive writings will help synthesize the material from disparate sources. Paper topics will include:
 - What are the central questions in the ethnomathematics program?
 - How does “intentionality” help understand case studies in ethnomathematics?
 - What is the role of mathematics in understanding other cultures?

Below is a broad outline of the trajectory for this course. It is subject to change based on our progress.

- *Weeks 1–5: Introductory material*
General articles will help us to understand the general nature of ethnomathematics, terms commonly encountered, and the types of questions typically addressed.
- *Weeks 6–9: Group Project: Case study*
We will select one region of the world to study as a class. After breaking up into teams, we will take stock of the mathematics and culture of the subject and devise our own suggestions of how we might more closely connect our understanding of mathematics to that area.
- *Weeks 9–12: Case studies and critiques*
We will look at further examples of ethnomathematics and some critiques in preparation for the individual projects.
- *Weeks 11–15: Independent research*
Everyone will be asked to complete a research report on one topic of their choosing. Details on this will be provided near the middle of the semester.
- *Weeks 14–16: Group project synthesis*
We will test lesson plans, present research results, pull together the material gained from the team-based research, and prepare the final product of our efforts.

A regularly updated schedule, including day-by-day readings and agendas, is available on the class page: <http://math.moravian.edu/hartshorn/math195>.

Grading Policy

To determine your numeric grade at the end of the course, I will use the following distribution:

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| 25% | <i>Engagement with the material and the class (in the classroom)</i>
This score reflects both attendance and active participation in the classroom activities. |
| 10% | <i>Participation in on-line discussion</i>
This score reflects regular engagement with the material by participating in the course discussion board. |
| 30% | <i>Written papers</i>
This score reflects written work in addition to the work toward the group project and individual research project. |
| 15% | <i>Group project work</i>
This score reflects contribution to the class project that will occupy the middle third of the course. |
| 20% | <i>Individual Research project</i>
This score reflects success in completing a significant research project in ethnomathematics. |

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 mean:

- 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.
- Full engagement with the class – cell phones should be turned off (or set to vibrate), and you should not be sending or receiving text messages during class.

Each day, you will receive one of the following scores for participation:

X (absent) = 0	L- (late) = 3	L (late) = 5	L+ (late) = 7
	√- (present) = 6	√ (present) = 8	√+ (present) = 10

The +/- is given based on the quality of your participation.

Note that there are no “excused” absences. Any time you miss class incurs a cost: you miss important discussions, you break up class-to-class continuity. It is up to you to decide whether the cost is worth missing the class. Any missed class will garner an “X” for that day’s entry into the gradebook.

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. That is, up to 3 “X” scores for participation will be not be counted in computing your grade. Absences beyond these 3 will incur a penalty to your course grade, regardless of the reason for those absences.

If you know you will be missing class, let me know as soon as possible (before the class you will miss) so that any necessary special arrangements can be made.

If you miss class for an unforeseen reason (sudden illness, car breakdown, etc.), send me e-mail (hartshorn@math.moravian.edu) as soon as possible to ensure that you can make up any work missed and are not unfairly penalized.

You have sole responsibility for all work and information you miss by not attending class, regardless of the reason.

On-line discussion and article analysis

A discussion board is available on the course Blackboard site. Everyone will need to genuinely engage in the discussion on the forums. Genuine engagement means

- a tone and style of writing appropriate for academic discussion (e.g., l33t-speak and texting acronyms should be avoided);
- complete, thoughtful responses, written with appropriate sentence and paragraph structure (try to avoid 1-line responses: be sure to explain your stance, argument, or point);
- avoiding off-topic postings*.

For each genuine post, you will accrue points toward your on-line discussion score:

2 pts	For starting a new thread
3 pts	For responding to a classmate’s post
6 pts	For posting an article analysis for discussion

By the end of the semester, you should accrue approximately 70–80 points. Thus your on-line engagement score will be based on what percent of 80 points you reach (maximum 100%). For example, if you accrue 60 points by the end of the semester, you will get a 75% for your on-line discussion score (since $60/80=0.75$).

* Two forums (“Feedback” and “Off-topic”) will be provided for your use. While you are encouraged to take advantage of these forums, they will not count toward your participation grade for the course.

Group Project

After exploring some of the central ideas to ethnomathematics, we will apply our understanding of the subject to one particular region of the world. The class will break up into teams to tackle various aspects of our analysis. Details on this class project will be given later, but your score for the group project will be broken down as follows:

4 pts	Paper: proposal for subject of analysis
4 pts	Results of team contribution to project
4 pts	Report on team collaboration efforts
3 pts	Contribution to final collaboration (editing, creation of supplementary materials, field testing, other finishing work)
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15 pts	<i>Total contribution to final grade</i>

Individual Research Project

Everyone will be asked to choose a particular topic in 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. Your grade for the individual research project will be determined as follows:

2 pts	Initial project proposal
4 pts	Project prospectus
3 pts	Report on project to the class
4 pts	First submitted draft
4 pts	Reflection on research and topic
3 pts	Final draft
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20 pts	<i>Total contribution to final grade</i>

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

Academic Honesty

Students will be expected to adhere to the standard of the Academic Honesty policy as described in the Student Handbook (pages 33–38). 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.

In particular, ***you are strongly urged to review the section on plagiarism in the student handbook.*** All writings, both electronic and hard-copy, are expected to be your own work.

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@math.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.