

ETHNOMATHEMATICS

. . . the dynamic relationship between culture and mathematics. . .

Mathematics 340: 3 credit hours
Tuesday/Thursday, 2:00 – 3:15 p.m.
Wubben 140

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Do you believe that mathematics is culture free?
Do you see mathematics as a collection of equations, rules, and facts?
Do you think that mathematics has little relevance to the lives of most people?
Have you ever thought that mathematics is done only by a group of elite braniacs working on equations in isolation?
Have you ever wondered what mathematics really is and who makes that decision?
If you answered YES! To any of these questions, then this is the class for you!

The goal of this course is to broaden your perspective on what constitutes mathematics. We will explore mathematical concepts embedded in the daily lives of people in diverse cultural settings at times past and present. You will learn about mathematics by actively engaging in a collaborative learning environment. We will do mathematics through readings, study, lectures, presentations, and field trip experiences. My hope is that you will never again view mathematics in the same way; you will have gained a new appreciation for mathematics by viewing it through a cultural lens.

Objectives for the course including the following . . . Students will . . .

- Study mathematics embedded within diverse cultures.
- Develop a personal definition of what constitutes mathematics.
- Gain a new perspective in identifying mathematical elements in everyday life.
- Deepen their understanding of mathematics through comparisons of mathematical elements in different cultures.

Required text for the course is Multicultural Mathematics in the Classroom by Claudia Zaslavsky, Heinemann Publishing, 1996.

Supplemental text (24-reserve at the library) is Ethnomathematics by Marcia Ascher, Brooks Cole Publishing, 1991.

Several supplemental readings are required. Readings will be supplied by the instructor or can be accessed through the internet. Assignments, presentations, exams, and field trips all constitute evaluation pieces for the course. A complete listing of requirements and grading procedures will be found on page 4 of this syllabus.

An outline for the course is provided for your convenience in planning during the semester. Adjustments to the schedule may be made during the semester as needed.

Course Outline & Planning Guide

| Dates | Tuesday | Thursday |
|------------------|---|--|
| Aug 24/26 | Course Introduction I've Got Your Number | What Numbers Me to Me Assignment Discussion The Bishop Six |
| Aug 31 Sept 2 | Sticks & Stones: Elements of Counting Two by Two . . . <i>Video: A History of Numbers</i> | Finding a Base. . . the Magic Number! Egyptian, Babylonian, Roman, Chumash, Yu'Pik |
| Sept 7/9 | Labor Day Break – No class | Counting with Pebbles and Strings Abacus and Quipus |
| Sept 14/16 | Archaeoastronomy Principles Petroglyph Calendar <i>Video: Watcher of the Winter Sun</i> <i>Video: The Sun Dagger</i> | Chaco Canyon Archaeoastronomy <i>Video: The Mystery of Chaco Canyon</i> |
| Sept 21/23 | Solstice Markers of the Fremont Pintado Canyon Solstice Marker | Pintado Canyon Field Trip – No class |
| Sept 28/30 | Field Trip Discussion <i>Video: Sun Calendars of the Ancient Puebloans</i> | Game Playing: Types of Games Logic Puzzles, Topological Puzzles, Games of Skill, Games of Strategy, Games of Chance |
| Oct 5/7 | Senet, Perudo, Beaver Teeth, Coyote & Chickens | Student Game Presentations |
| Oct 12/14 | Design Elements of Circles & Lines Symmetry Patterns | Symmetry Patterns of Baskets, Ute Beadwork Designs, Quilting |
| Oct 19/21 | Fall Break – No class | Mid-Term Exam |
| Oct 26/28 | Ute Indian Museum Field Trip | Field Trip Discussion <i>Video: Honoring Ute Ways</i> |
| Nov 2/4 | Navajo Rug Designs Native American Pottery Designs Field Trip to MSC Library Archives | Network Theory Bushoong Sona |
| Nov 9/11 | Wearing Your Measurements Who gets to decide? | Aztec Measurements Secrets of Pi |
| Nov 16/18 | Maya Mathematics | More Maya Mathematics |
| Nov 23/25 | Field Trip to Downtown Looking for the Bishop Six | Thanksgiving Break – No class |
| Nov 30 Dec 2 | Bishop Six Reports | Walpiri Kinship System The Magic of Magic Squares |
| Dec 7/9 | Student Final Project Reports | Student Final Project Reports |

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| Dec 14/16 | Final Exam 1:00 – 2:50 p.m. | Pick up Final Exams, All Day |
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Assignment Guide

| Dates | Tuesday | Thursday |
|------------------|---|--|
| Aug 24/26 | Assignment 1: Interview with 5 people Reading: Chapter 1 MMC | Assignment 2: Bishop Six Reading: Chapter 4 MMC Chapter 1.1-1.6 EM |
| Aug 31 Sept 2 | Assignment 3: Grouping Descriptions Reading: Chapter 5:MMC | Assignment 4: Classifying Number Systems Reading: Chapter 6: MMC Chapter 1.7-1.8 |
| Sept 7/9 | Labor Day Holiday | Assignment 5: Quipu Recordings Reading: Chapter 7: MMC |
| Sept 14/16 | Assignment 6: Finding True North | Assignment 7: Solstice Alignments |
| Sept 21/23 | | Field Trip – No class |
| Sept 28/30 | Reading: Chapter 11 MMC Chapter 4 EM | Assignment 8: Game Presentation |
| Oct 5/7 | | Reading: Chapter 9 MMC Chapter 5.1 EM Chapter 6 EM |
| Oct 12/14 | Assignment 9: Symmetry Strip Patterns | |
| Oct 19/21 | Fall Break | Mid-Term Exam Assignment 9: Ute Beadwork Coding |
| Oct 26/28 | Field Trip to Ute Indian Museum | Assignment 10: Honoring Ute Ways & the Bishop Six |
| Nov 2/4 | Assignment 11: Pottery Identification Reading: Chapter 2 EM | Assignment 12: Your Bushoong Luna Reading: Chapter 7 MMC Chapter 8 MMC |
| Nov 9/11 | Assignment 13: Measurement System | Assignment 14: Aztec Measuring |
| Nov 16/18 | | Assignment 15: Measuring in Maya Art & Architecture |
| Nov 23/25 | Assignment 16: Bishop Six in Downtown GJ | Thanksgiving Break |
| Nov 30 Dec 2 | Reading: Chapter 3 EM | Reading: Chapter 12 MMC Chapter 7 EM |
| Dec 7/9 | | Assignment: Study for final |

It is expected that you will attend all classes as stated on the syllabus. One of the field trips will be on a Saturday morning so make plans NOW to attend this event. Other field trips will be taken during an assigned class day but extended time will be needed for the Montrose trip.

Participation in group projects and discussions are expected for all classes. Reading assignments should be done in advance so you are prepared to discuss the topics from a knowledgeable perspective. Supplemental readings will also be given to you for advance reading.

Assignments are due the next class meeting immediately following the assignment. Late assignments will automatically be penalized one letter grade for each class day late.

Everyone is expected to choose a topic to research and present to the class during the final week of the semester. Suggestions for topics can be found in the bibliography section of both textbooks. Additional topics can be found in the Ethnomathematics Digital Library or the International Study Group for Ethnomathematics website.

Grades will be determined by the quality of work on assignments, exams, projects, and class discussions. Grade assignments will use the scale of 90-100 A; 80-89 B; 70-79 C; 60-69 D; below 60, F.

Summary of points is listed below:

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|---------------------------------|-----|
| 16 assignments @ 20 points each | 320 |
| 1 mid-term exam | 100 |
| 1 final project | 50 |
| 1 final exam | 150 |
| Classroom participation | 30 |
| TOTAL | 650 |