MATH 111: Math for Elementary and Middle School Teachers I

Instructor
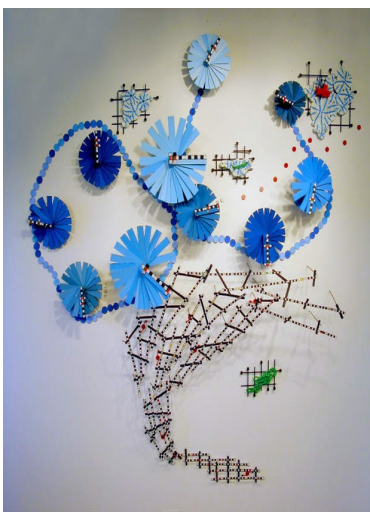
Dr. Ariel Ramirez

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Office: LRC 172

Class Details

Tuesday/Thursday
Class Time: 12-1:15pm
Room: VAAS 129

Office Hours

M/W 1:30-3pm (Math Center)
T/Th 2-3pm (Math Center)

"Happy Dog" - Nathalie Miebach

Contents

Course Description

This course offers an in-depth look rational numbers, arithmetic operations (addition, subtraction, multiplication, and division), and basic geometric concepts. Problem solving is emphasized throughout. (3 Credit Hours).

Prerequisites/placement: Successful completion of MATH 021/022 or Math 100.

Course Outcomes

Goal 1: Represent numbers and operations with models.

SLO 1: Use visual models, including physical objects, drawings of counts, lengths, and area, number lines, and symbols to represent numbers and operations, and flexibly move between representations.
SLO 2: Explain the relationship between contexts and the appropriate mathematical operations.

Goal 2: Identify and use the deeper structures of arithmetic.

SLO 1: Analyze and perform multiple methods for doing addition, subtraction, multiplication, and division.
SLO 2: Analyze student work, assess the validity of arguments, and identify mathematical misconceptions in mistakes.
SLO 3: Describe and use the relationships between operations to represent and solve problems.
SLO4: Describe and use strategies for mental computation and estimation using fact families, the structure of base-ten numbers, and the properties of arithmetic.

Goal 3: Explain concepts in arithmetic.

SLO 1: Explain procedures for doing addition, subtraction, multiplication and division with base-10 numbers using correct mathematical terminology and notation.
SLO 3: Explain why the commutative and associative properties of addition and multiplication and the distributive property of multiplication over addition make sense.
SLO 4: Explain how estimation and rounding work using models and correct mathematical terminology and notation.
SLO 4: By the end of the course, students will be able to communicate how various mathematical concepts are interconnected and describe the application of mathematics in a diverse range of fields.

Goal 4: Explain concepts in geometry.

SLO 1: Describe, using appropriate vocabulary and representations, how points, lines, and angles relate to each other and to applications in the real world.
SLO 2: Explain different ways to classify two-dimensional shapes based on their properties.

Classroom Policies

Attendance / Participation

- You are expected to be <u>on time</u> to each class and stay the <u>entire</u> class, have the necessary course materials on hand, and participate in the lecture and/or group activities.
- If you know ahead of time you will miss a class, send me an email indicating the date of the absence.
- Arrange before the next class meeting to get notes from a classmate. The student bears full responsibility for the material and information covered in class.
- Each student starts with 50 attendance points. Attendance is taken at the **beginning** of class. Five attendance points are deducted for each unexcused absence; 2.5 attendance points for tardiness.
- Students are expected to be actively engaged in class. Class sessions may include discussions, activities, board work, group assignments, and/or individual assignments.

Homework

- Homework is assigned nearly every week at the end of the week.
- The homework will be due the following week before the beginning of class.
- **Late homework is not accepted**.

Group Assignments

- There will be 2 or 3 small assignments to be completed in a group.
- Groups will be between two and three students.
- These assignments will further develop your conceptual understanding of the topics presented in the course.
- **You must be present to participate and receive any credit**.

abcgallery.com – Internet's biggest art collection

"Gorge Improvisation" - Kandinsky 1914

Exams/Final Exam

- A couple of exams will be given during the semester. Students are expected to clearly show their work.
- All of the tests (including the final exam) will be a paper/pencil test where students are expected to show all work to get full credit. Notes and calculators are **not** allowed on the exams or final exam.
- If you are unable to take a test, you must notify me in advance of the scheduled test. I will determine if and when a make-up test is to be administered.
- The final exam in this class is worth 100 points. The sections covered will be communicated as we near the end of the semester.
- Permission to take the final exam other than as scheduled occurs only under extenuating circumstances as approved by me. Emergency situations will be considered on an individual basis.

Classroom Policies (cont'd)

Grading Distribution & Scale

Attendance	50 points
Homework	200 points
Group Assignments	50 points
Exams	200 points
Final Exam	100 points
Total	600 points

GRADING SCALE: Students in this course will receive the following grades:

A	90 – 100%
B	80 – 89%
C	70 - 79%
D	60-69%
F	0-59%

Course Materials

Textbook(s):

♦ Bassarear, T., and Moss, M. (2016). Mathematics for elementary school teachers., 6th edition. Cengage Learning. Boston, MA.

The Mayans Number System

The Mayan number system dates back to the fourth century and was approximately 1,000 years more advanced than the Europeans of that time. This system is unique to our current decimal system, which has a base 10, in that the Mayan's used a vigesimal system, which had a base 20. This system is believed to have been used because, since the Mayan's lived in such a warm climate and there was rarely a need to wear shoes, 20 was the total number of fingers and toes, thus making the system workable. Therefore two important markers in this system are 20, which relates to the fingers and toes, and five, which relates to the number of digits on one hand or foot.

The Mayan's were also the first to symbolize the concept of nothing (or zero). The most common symbol was that of a shell ( ) but there were several other symbols (e.g. a head). It is interesting to learn that with all of the great mathematicians and scientists that were around in ancient Greece and Rome, it was the Mayan Indians who independently came up with this symbol which usually meant completion as opposed to zero or nothing.

http://www.math.wichita.edu/history/topics/num-sys.html

Student Resources

If you are struggling in this course, do not be afraid to ask for help!

- Office Hours: See my office hours listed at the beginning of this syllabus. Feel free to come by or log in for online office hours, or make an appointment to get help.
- Form study groups: You may work together with other members of our class.
- Free Tutoring: The Math Center at Valencia campus has free tutoring and open labs. Call 505-925-8907 for more information.
- Student Services: There are various services provided in our Student Services Department. See below about equal access. Also, we have a testing center, advising, and career placement available: Valencia Student Services

University Policies

Equal Access

In accordance with University Policy 2310 and the Americans with Disabilities Act (ADA), academic accommodations may be made for any student who notifies the instructor of the need for an accommodation. It is imperative that you take the initiative to bring such needs to the instructor's attention, as I am not legally permitted to inquire. Students who may require assistance in emergency evacuations should contact the instructor as to the most appropriate procedures to follow. Contact Accessibility Resource Center at 277-3506 for additional information.
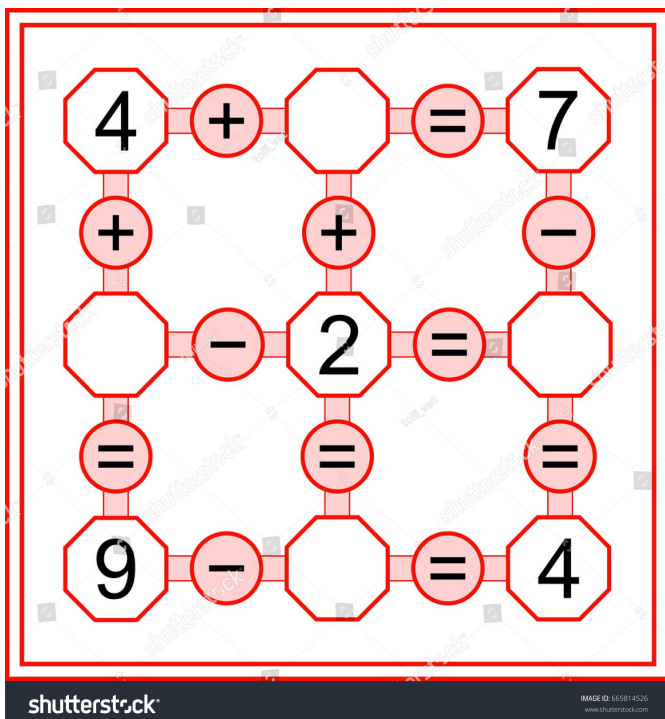
If you need an accommodation based on how course requirement interact with the impact of a disability, you should contact me to arrange an appointment as soon as possible. At the appointment we can discuss the course format and requirements, anticipate the need for adjustments and explore potential accommodations. I rely on the Disability Services Office for assistance in developing strategies and verifying accommodation needs. If you have not previously contacted them I encourage you to do so.

If you are a Valencia campus student, contact Equal Access Services at Valencia Campus, Jeanne Lujan at (505)925-8910 or Valencia Student Services. If you are a main campus student you can receive documentation from the main campus Accessibility Resource Center. I will not guarantee accommodation without the appropriate documentation.

Collegial Behavior

Since I assume you are all adults, I will expect from you respectful adult behavior. Engaging in disruptive or unruly behavior could result in your being asked to leave, at which time you will be counted absent and a referral will be sent to the Associate Dean of Student Services. Continuing to behave in this way could result in your being dropped from the course. Disruptive or unruly behavior includes but is not limited to:

- texting or talking on your cell phone at any time during class,
- continually talking with your neighbor when we are not working on a group activity,
- working on homework from another class,
- reading material or watching media on a mobile device not related to this course or at a time that is inappropriate,
- refusing to participate in the class activities.

Academic Integrity

Having academic integrity is paramount to your success in any class. Plagiarism or cheating is not tolerated. Any instance of this will result in a grade of zero for that assignment. Here is the link to the UNM Academic Dishonesty Policy: https://policy.unm.edu/regents-policies/section-4/4-8.html. The policy states:

Each student is expected to maintain the highest standards of honesty and integrity in academic and professional matters. The University reserves the right to take disciplinary action, up to and including dismissal, against any student who is found guilty of academic dishonesty or who otherwise fails to meet the expected standards. Any student judged to have engaged in academic dishonesty in course work may receive a reduced or failing grade for the work in question and/or for the course.

Academic Dishonesty is defined as:

"Academic dishonesty" includes, but is not limited to, dishonesty in quizzes, tests, or assignments; claiming credit for work not done or done by others; hindering the academic work of other students; misrepresenting academic or professional qualifications within or without the University; and nondisclosure or misrepresentation in filling out applications or other University records.

Title IX Reporting Obligations

In an effort to meet obligations under Title IX, UNM faculty, Teaching Assistants, and Graduate Assistants are considered "responsible employees" by the Department of Education (see pg. 15 - http://www2.ed.gov/about/offices/list/ocr/docs/qa-201404-title-ix.pdf). This designation requires that any report of gender discrimination which includes sexual harassment, sexual misconduct and sexual violence made to a faculty member, TA, or GA must be reported to the Title IX Coordinator at the Office of Equal Opportunity (oeo.unm.edu). For more information on the campus policy regarding sexual misconduct, see: https://policy.unm.edu/university-policies/2000/2740.html

Course Outline

The course outline may be modified as the semester progresses.

Week	Dates	Sections / Topics	Assignments
1	8/21-8/23 T/Th	Intro and 1.1: Problem Solving 1.2: Process, Practice, Content Standards	Read: Chapter 1 , Section 1 and Section 2
2	8/28-8/30 T/Th	2.2 – Numeration (Other bases) 3.1 – Understanding Addition	Read: Chapter 2, Section 2 Read Chapter 3, Section 1
	8/31 F	**Last day to add a course (5pm)**	
3	9/4-9/6 T/Th	3.1 – Understanding Addition 3.2 – Understanding Subtraction	Read: Chapter 3, Section 2
	9/7 F	**Last day to drop a course without a grade (5pm)**	
4	9/11-9/13 T/Th	3.2 – Understanding Subtraction Catch-up and Review	
5	9/18-9/20 T/Th	**Exam 1** 3.3 - Understanding Multiplication	Read: Chapter 3, Section 3
6	9/25-9/27 T/Th	3.3 - Understanding Multiplication	
7	10/2-10/4 T/Th	3.4 Understanding Division	Read: Chapter 3, Section 4
8	10/9-10/11 T/Th	3.4 Understanding Division **Fall Break 10/11 (no class)**	
9	10/16-10/18 T/Th	4.2 Fraction and Rational Numbers	Read: Chapter 4, Section 2
10	10/23-10/25 T/Th	4.2 Fractions and Rational Numbers Catch-up and Review	
11	10/30-11/1 T/Th	**Exam #2** 4.4 Decimals (no operations)	Read: Chapter 4, Section 4
12	11/6-11/8 T/Th	4.4 Decimals (no operations) 8.1 Basic Ideas & Building Blocks of Geometry	Read: Chapter 8, Section 1
13	11/13-11/15 T/Th	8.2 Two Dimensional Figures	Read: Chapter 8, Section 2
14	11/20-11/22 T/Th	8.2 Two Dimensional Figures **Thanksgiving Holiday 11/22 (no class)**	
15	11/27-11/29 T/Th	Number Theory	
16	12/4-12/6 T/Th	Review Week	
17	12/10	**Final Exam Week**	