

Math for Elementary School Teachers II**Instructor:****Class meetings:****Office Hours:****Office Location:****Office Phone Number:****E-mail address:****Website:****Materials:**

- Mathematics for Elementary Teachers, Eight Edition by Musser, Burger, & Petersen.
- Calculator (scientific), ruler, compass, protractor
- 8 1/2 by 11 graph paper
- Geometry graph paper book – will be available to print on Canvas
- Notebook for your notes
- Dictionary – smaller notebook in which you will record new vocabulary and can use as a reference in this and future classes. It would be super convenient if it had A-Z tabs, but you can make that happen with sticky tabs. If you're computer savvy you can make an electronic version, but please submit it electronically as well – no need to kill the trees.

Course Content: This course is the second in a sequence of two semesters of mathematics courses required for elementary school teachers. During this semester the students will concentrate on the geometry, measurement and data, as well as probability and statistics strands of K-8 mathematics courses. In this sequence it is assumed that students can perform calculations through college algebra and have had basic school geometry. However, they may not know why certain algorithms, or rules, work, why a geometric statement is true, or how to evaluate statistical information. For teachers this type of knowledge or understanding becomes very important. Elementary school pupils begin their learning by wanting to make sense of the world around them and of the ideas they encounter. "Making sense" of ideas lies at the heart of mathematics. To help students develop mathematical understanding, teachers need to develop their own ability to make sense of mathematical concepts. This is possible only to the extent that we take the initiative in learning to ask questions about why a process works or a statement is true. In this course, asking questions about our work will be encouraged, not having an answer will be a starting point, and you will expect to think, reason and justify your answers.

Expected Learning Outcomes: At the completion of this course, the students will:

- Understand that there are many measurable attributes of objects. Distinguish between 1-, 2-, and 3-dimensional attributes: length, area, volume.
- Be able to decide what is measured and what the appropriate units might be. Compare different units of measurement. Convert between different units.
- Know that area is measured in squares of given size and reported in square units. Explain where formulas for area of various polygons come from. Find areas of polygons given sufficient information.
- Understand that decomposition and rearrangement of parts does not change the area.
- Explain how scaling changes the area, and be able to use that knowledge when solving problems.

- Prove Pythagorean theorem and use it to find perimeters of polygons.
- Know that volume is measured in cubes of given size and reported in cube units. Explain where formulas for area of parallelepipeds come from. Find areas of polygons given sufficient information.
- Define rigid transformations and dilations. Perform these on a coordinate plane.
- Determine symmetries of a given object.
- Be able to represent the data in appropriate way. Interpret data from visual displays.
- Calculate and contrast mean, median, mode and give examples of when each is most appropriate. Compare different centers.
- Explain the meaning of arithmetic mean using visual representations.
- Calculate and interpret standard deviation and z-scores of a set of data.
- Determine the probability of an event using the Fundamental Counting Principle.
- Solve problems involving counting.

Course Grading

Written work, Portfolio	15%
Final project	5%
Midterm	30%
Attendance and participation	10%
Practicum Report	15%
Final exam	25%
TOTAL	100%

Attendance and participation:

Almost everyday during class, you will be working in groups on various activities. Expect to turn these in at any time during class. I expect you to come to every class on time, turn assignments when they are due, participate actively in classroom discussions and activities, and take notes in class. Because you are preparing to be a teacher, your participation needs to reflect professional learning. This means it will not just be judged on the basis of its content but also on the basis of its form: You will need to speak audibly, connect with your audience, modulate the words you utter, and use standard English. I will give you feedback on what you say and on how you say it, in the understanding that it matters to you because so much of our work as teachers includes speaking for others to understand us. For the reason that you need to be prepared to think on your feet and talk in public you should expect to be called on even when you don't volunteer. It is fair game (and deserves all our respect) if you ask for time to think about something or if you say, I don't know but here is how I would find out. For the same reason, I expect you will give me feedback when I speak in ways that are difficult to understand or to hear and that you will accept that at times I also need to regroup and think for a while.

Notes

1. **Class Tests:** The class test is tentatively scheduled for **September 26th** and **November 7th**. If any changes need to be made in this schedule, they will be announced in class a week prior to the test date.
2. **Portfolio:** Students will keep a portfolio, or organized folder of their work in the course. It will include all of your assignments, tests, practicum report as well as other artifacts from the course work. This will count as two assignments.
3. **Assignments:**
 - Throughout the semester you will be submitting individual and group work. Written work will be graded on four aspects: your understanding of the question, your explanation, your justification, and your answer. The first and last of these are worth a few points each, but most of the points are split between your explanation and justification. Explanation includes clarity and grammar as well as mathematical detail about what you did, what variables you used, and so forth. The level of justification we require will vary, but you should try to provide as complete a proof as you can. Each assignment will be announced a week ahead of its due date.
 - Certain assignments will have to be corrected and resubmitted. You will generally have to resubmit the assignment in class immediately following the one when the assignment was handed back. All work you submit must be yours! If I have any doubts about the origin of the work, I will not assign it a grade. More detailed hints and recommendations for your written work can be found on the website.
4. **Practicum Report:** Each student will spend six hours in an elementary school classroom, three periods observing and three periods presenting lessons to small groups of children. You are encouraged to select a **different grade** (differing by two or more) than you did in 4010. I recommend working with your students on topic of area or measurement. If this is absolutely impossible to achieve, the topic should be one we are covering in the course, and you should check with me before proceeding with the topic of your choice. Due on **Monday, November 19th**. More details are available on the website.
5. **Final Project:** Very often students tend to associate mathematics with worksheets, plug and chug exercises and endless repetition of things that were shown to them. The goal for the final project is for you to break these prejudices! The task is to use your creative side to teach and show what you've learned in this class. It will be due on **December 9th** for a class presentation.
6. **Final Examination:** The cumulative final exam is scheduled on **Monday, December 10, 18:00-20:00, in LCB121**.
7. **Cell Phones and Laptops and Ipads and Ipods and Iwhatevers:** Turn them down, turn them off, keep them out of sight. No text messaging, emailing, facebooking, tweeting, or whatever the newest thing is out there, unless specifically instructed by me. And, I will ask you to leave if I see you using them. Really.

- 8. Canvas:** All the course materials can be found on our course's Canvas page. This is my first semester using it, so bear with me!
- 9. Grading Scale:** The grade scale will be the usual:
 A (93-100), A- (90-92), B+ (87-89), B (83-86), B- (80-82), C+ (77-79),
 C (73-76), C- (70-72), D+ (67-69), D (63-66), D- (60-62), E (0-59).
- 10.** The University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If you will need accommodations in the class, reasonable prior notice needs to be given to the [Center for Disability Services](#), 162 Union Building, 581-5020 (V/TDD). CDS will work with you and the instructor to make arrangements for accommodations.
- 11.** In case you need it, but I hope you don't: Last day to drop the class is 8/29, and last day to withdraw from the class is 10/19.

12. Welcome!

Week	Date	Topic
1, 2	8/20 – 8/29	2d figures and area
3, 4	9/3 – 9/12	Measurement
5	9/17 – 9/19	Distance
6	9/24 – 9/26	Angles
7, 8	10/1 – 10/17	Symmetries and transformations
9, 10	10/22 – 10/31	Solids and volume
11, 12	11/5 – 11/14	Data and statistics
13, 14	11/19 – 11/28	Probability
15	12/3 – 12/5	Review
	12/10	Final Exam