

MTH 209 Syllabus
Numeracy for Teachers - 2
University of Rhode Island
FALL 2019

Instructor Contact Information

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Office Hours: Monday/Wednesday 1:00 pm – 2:00 pm or by appointment: [Book Appointment](#)
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Class time/location:

Class: M/W 11:00 – 11:50 Quinn Hall 103
Class/Recitation: F 11:00 – 12:40 PM Morrill Hall 215

Course Materials:

- Freitag, Mark A. Mathematics for Elementary School Teachers: A Process Approach. Brooks/Cole Cengage Learning. 2014 (same as MTH 208)
 - National Council of Teachers of Mathematics (NCTM). Principles & Standards of School Mathematics 2000 (available on Sakai)
 - Common Core State Standards (download at <http://www.corestandards.org/Math/> or app)
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MTH 209 Catalog Description

A continuation of MTH 208, including conceptual understanding supporting mathematical ideas presented in current, standards-based elementary mathematics education. An in-depth look at functions, relations, fractions, decimals, percents, probability and statistics, sets, logic, and additional work in geometry

Goals

The goal of this course is to continue to prepare you for the mathematical and analytical aspects of the world around you, and to help you develop a stronger, deeper mathematical knowledge as you embark on your teaching journey, so that you may understand the basic skills necessary to present to the diverse groups of students you encounter in your classrooms.

Learning Outcomes

By the end of this course you will:

- Develop a deeper mathematical knowledge required for your teaching career
- Become proficient in real world situations involving fractions, decimals and percents, gain a deeper understanding of variables and functions, probability, statistics and transformational geometry.
- Learn techniques for the classroom such as how to design a statistical study, how fractions, percents and decimals fit into our world, the connection between mathematics and other disciplines
- Have a better understanding of what standards you will be required to address as a teacher.

Mathematics Educational Objectives

- To apply arithmetic, algebraic, geometric, higher-order thinking and statistical methods to modeling and solving real-world situations.
- To represent and evaluate basic mathematical information verbally, numerically, graphically, and symbolically.
- To expand mathematical reasoning skills and formal logic to develop convincing mathematical arguments.
- To use appropriate technology to enhance mathematical thinking and understanding and to solve mathematical problems and judge the reasonableness of the results.
- To interpret mathematical models such as formulas, graphs, tables and schematics, and to draw inferences from them.
- To recognize the limitations of mathematical and statistical models
- To develop the view that mathematics is an evolving discipline, interrelated with human culture, and understand its connections to other disciplines.

Expectations

- Attend each class. Come prepared and be punctual. If you must be absent, contact me prior to your absence and explain to me why you will miss class. Random attendance checks will occur.
- Ask questions when needed.
- Doing well in this course requires effort on your part: come to class, be ready to learn, review your notes, and ask questions. We will devote some class time each day to addressing any problems or concerns you might have. You are also always welcome to email e or stop by my office to ask questions.
- Be respectful of yourself and your classmates. This means cell phones and iPods should be turned off during class time and the work that you submit must be your own (unless otherwise stated). In support of honest students, those discovered cheating on assignments or exams will receive a grade of zero on the assignment or exam.
- Use of unauthorized aids such as cheat sheets or information stored in calculator memories will be considered cheating. The Mathematics Department and the University strongly promote academic integrity.

Grading Policy:

You will be graded on quizzes, tests, homework, and a culminating portfolio throughout the course of the semester. There will be approximately 10 very short quizzes. Weights will be given as follows:

Homework	10%
Quizzes	15%
3 Exams	30%
Portfolio	25%
Final Exam	20%

Grading Scale

I will use the following scale for your grade in this course:

A	93 – 100	C	73 – 76
A-	90 – 92	C-	70 - 72
B+	87 – 89	D+	67 – 69
B	83 – 86	D	63 – 66
B-	80 - 82	D-	60 - 62
C+	77 - 79	F	< 60

Make-Up Policy

- Exams **will not be made up** unless you have a documented emergency that you have told me about **prior to the date of the exam**. A make-up exam will be created for you that you must take within **one week** of the original exam date.
- Quizzes and homework assignments **will not be made up**.
- Your **attendance** in class, therefore, is **critical**.

University of Rhode Island's Civility Policy

The University of Rhode Island is committed to developing and actively protecting a class environment in which respect must be shown to everyone in order to facilitate the expression, testing, understanding, and creation of a variety of ideas and opinions. Rude, sarcastic, obscene or disrespectful speech and disruptive behavior have a negative impact on everyone's learning and are considered unacceptable. The course instructor will have disruptive persons removed from class if necessary.

Accommodations

If you have a documented disability that may require individual accommodations, please make an appointment with me as soon as possible and provide written documentation so that, together, we may work out reasonable accommodations to support your success in this course. For further information or assistance, please contact URI's Disabilities Services for Students, Office of Student Life, Room 330 of the Memorial Union, or at (401) 874-2098.

URI's Academic Honesty policy

Students are expected to be honest in all academic work. A student's name on any written work, quiz or exam shall be regarded as assurance that the work is the result of the student's own independent thought and study. Work should be stated in the student's own words, properly attributed to its source. Students have an obligation to know how to quote, paraphrase, summarize, cite and reference the work of others with integrity. The following are examples of academic dishonesty.

- Using material, directly or paraphrasing, from published sources (print or electronic) without appropriate citation
- Claiming disproportionate credit for work not done independently
- Unauthorized possession or access to exams
- Unauthorized communication during exams
- Unauthorized use of another's work or preparing work for another student
- Taking an exam for another student
- Altering or attempting to alter grades
- The use of notes or electronic devices to gain an unauthorized advantage during exams
- Fabricating or falsifying facts, data or references
- Facilitating or aiding another's academic dishonesty
- Submitting the same paper for more than one course without prior approval from the instructors.

Academic Enhancement Center

This can be a challenging course. Success requires that you keep pace with the work, understand course concepts, and study effectively. The Academic Enhancement Center helps URI students succeed through three services: Academic Coaching, Subject-Based Tutoring, and The Writing Center. To learn more about any of the services below, please visit uri.edu/aec or call 401-874-2367 to speak with

reception staff. In Providence, the Academic Skills Center (ASC) is at 239 Shepard Building, (401) 277-5221. Hours are posted each semester at <http://web.uri.edu/ceps/academic-skills-center/>

Math & Physics Walk-tutoring (located in rooms 201 and 205 in Lippitt Hall,) is a no-appointment-needed tutoring center where you can work with tutors and other students in this and other math courses. They provide free support in all math courses up to MTH 243. Bring your book, notes, and questions with you.

Homework Expectations

- Homework is an integral component to help you do well in this course. Each homework assignment is expected to reflect **your best work** and should either be typed or neatly written with answers clearly shown.
- Your portfolio should contain 8 - 10 samples from the homework, assessments, or certain tasks from in-class work. You will have the opportunity to choose which problems you discuss from the total of over 150 problems over the course of the semester.
- Homework will be due at the beginning of class. Homework assigned in one class is due at the start of the next class. I will return it to you as soon as possible (hopefully at the class following) with corrections and commentary.
- Each problem will be worth 3 points and will be graded as follows:
 - 3 points – completely correct, all work shown, clear and concise, method used is explicitly stated
 - 2 points – completely correct, most work shown, clear, method used is implied
 - 1 point – error in completing problem, work is hard to follow or not available, method used is unclear
 - 0 points – problem is incorrect and work is not available or does not follow, no clear method is used or no homework is turned in.
- Homework should not be just a listing of answers; any homework assignment not showing full and complete work necessary to reach the solution will receive a zero (0).
- You will be expected to review the homework and the feedback I provide before you select your portfolio entries. You are welcome to talk to me during office hours about ambiguities or portfolio questions.
- I will continue to provide you with feedback on your writing for your portfolio entries. You will have the opportunity to hand in a rough draft of your work to me to go over with you before handing it in. We will spend some class time talking about how to formally write your portfolio essays, and you will be able to work in small groups to discuss your writing.

Recitation Hour & Portfolio

Once a week, we will meet for recitation. During this extra 50-minute session, you may expect the following:

- You will work in groups to explore and complete problems from the Portfolio Entry Sheets.
- Your group will present one of these problems to the remainder of the class. This presentation will include
 - A statement of the problem
 - Method/strategy used to solve the problem
 - Complete solution to the problem
 - Statement of the NCTM and Common Core standards addressed in the problem
 - Indication of an appropriate grade level for this problem
- Presentations will be graded as a quiz out of 10 points (2 points for each of the bullets above)

- The task and solution will be uploaded to a specific location on the MTH 209 course page on SAKAI so it is available to the entire class.
- You may wish to bring in visual aids, manipulatives (blocks, rods, diagrams), or other activities to get your classmates involved in the lesson.

During our first recitation, we will go over, in detail, the exact expectations and procedures for the rest of the semester. Presentations will begin in Week 2.

Portfolio Expectations

As we go through the semester, you will collect materials and we will cover skills that specifically address the National Council of Teachers of Mathematics Principles and Standards and the Common Core State Standards in Mathematics. As teachers, you will be required to concentrate on these standards in your own classroom.

Therefore, for your portfolio, you will be solving a variety of problems and matching them to the standards at different grade levels.

You will be asked to examine specific problems that represent each of these standards. Ten portfolio assignments will be provided with exercises that relate to what has been studied in class. These problems will be included in your final portfolio as representative of some of the standards. At the end of each of the portfolio assignment is a question regarding which standards have been addressed. As part of our recitation class, we can discuss some of these problems and the related standards.

- In a formal report, you will describe common mistakes made for each type of problem and give a detailed, step-by-step, annotated solution of each problem. In your portfolio report, you will talk about how each problem relates to the chosen standard or grade span expectation for Rhode Island students.
- The portfolio will be graded on a rubric and is worth 25% of your grade; it will be graded rigorously. To aid you in keeping up with the work, there will be three checkpoints throughout the semester. Dates for these checkpoints are listed on the suggested calendar at the end of the syllabus. However, if you keep up with it throughout the semester, and come see me to work out specific details or questions you may have, there is no reason why you should not do well. Checkpoints will be graded as a homework (for completion on time, not necessarily accuracy at that time).
- This detailed report is something you will want to hold on to as a future educator. Use it to benefit yourself; add as many details as you can and describe any obstacles you ran into while solving the problems in your report. I will help you with it throughout the semester, as needed.
- The NCTM Principles and Standards can be found on our Sakai site
- The Common Core State Standards for mathematics can be found <http://www.corestandards.org/Math/> or download the app.
- Also to be included in the portfolio are four (4) reflection papers (short: 1-2 pages only), one for each article you will be asked to read and reflect upon.
 - For your reflection papers:
 - Read the article first
 - Think of the mathematics content of the lesson discussed in the article – how were you taught that content? Did you learn it well? Did you understand it?
 - What was it about how you learned that content that caused problems or made it easy to learn? Or do you think the method(s) might make it more difficult to learn the content?

- How would the methods mentioned in the article make it easier for children to master the content?
 - Do you think this is something you might try in your own classroom?
 - Describe how you might use this in your classroom or discuss why you wouldn't incorporate it at all
- Up to 10 homework tasks will also be included in your portfolio with indications of the standards they address. These homework tasks can be those that you found difficult but finally managed to complete, tasks that you found intriguing or tasks that you just "enjoyed" solving and wish to include. **For each of these, comment on why the particular task is included.**
 - Make sure you **keep all of the work** that you complete in the course, whether personal notes or graded work, so that when it comes time to create your portfolio, you will have all your materials collected and be prepared to put your report together.

PORTFOLIO DIRECTIONS

1. Portfolio checkpoints and the final portfolio will be uploaded into assignments on Sakai
2. Order of inclusion:
 - a. Standards Cover Sheet
 - b. Portfolio tasks
 - i. Each portfolio sheet
 - ii. Five tasks (including group tasks) on separate sheets w/ standards; clearly label the sheet number and problem number (as it appears on the sheet). Here is a link to the template if you would like to use for your portfolio: [Portfolio Template](#) Please copy and paste the template into your own document - do not use this one :)
 - iii. Tasks done by groups – **be sure to have group names on them for identification purposes; explain what you liked and/or would do differently or change/modify.**
 - c. Homework – clearly labeled w/ assignment #, page # and problem #; **explain why you chose to include in your portfolio**
 - d. Reflections
3. Double-check your spelling and typos so all work is as professional looking as possible.
4. As you work, keep the rubric handy for reference so you are sure you have met all the conditions on it.
5. ********* Upload with the title: Your Name, Portfolio Checkpoint #

PORTFOLIO CHECKPOINT REQUIREMENTS:

<u>CHECKPOINT #</u>	<u>DATE</u>	<u>PORTFOLIO REQUIREMENTS</u>
1	9/25	Problems from portfolio sheets 1, 2, & 3 2 problems from homework or in-class work Reflection on Reading #1
2	10/16	Problems from portfolio sheets 4 & 5 2 new problems from homework or in-class work Reflection on Reading #2
3	11/13	Problems from portfolio sheets 6, 7, & 8 2 new problems from homework or in-class work Reflection on Reading #3
4	12/4	REVISED Problems from ALL sheets & problems from sheets 9 & 10 2 additional problems from homework or in-class work Reflection on Reading #4 SEE PORTFOLIO RUBRIC FOR DETAILS

Skill Areas Addressed

We will be addressing three main skill areas throughout this course:

1. Use of Quantitative Data

Course requires assignments which involve the analysis, interpretation, and/or use of quantitative data to test a hypothesis or illustrate and describe patterns. We will be exploring quantitative data on a daily basis.

2. Use of Qualitative Data

Course requires assignments which involve the analysis, interpretation, and/or use of qualitative data to test a hypothesis, build a theory, or illustrate and describe patterns. We will be exploring qualitative data throughout the course, building, testing, and proving methods and conjectures.

3. Write Effectively

Course requires written assignments designed to allow students to practice and improve communication skills with instructor and/or group feedback.

Proposed Calendar –

This is a working timeline of what topics can be expected to be covered in class each week. Topics and/or topic dates **may change** based on level of interest, level of understanding, or other related issues.

MTH 209 PROPOSED CALENDAR FALL 2019					
DAY #	DAY	DATE	CHAPTER & SECTION	HOMEWORK ASSIGNMENT *due the following class	SPECIAL ANNOUNCEMENTS
1	Wed	9/4	Intro, syllabus, requirements of course	Problem to solve	
2	Fri	9/6	Place Value The NCTM Process Standards and the CCSSM Practices Recitation: Review of Requirements; Choose Groups/Names Choose problems	A 1.1 pp 12-16 # 18, 19, 34, 38, 39	
3	Mon	9/9	Ch. 2 Sets & Logic 2.1 Set Basics	A 2.1 pp 86-90 # 14, 24, 27, 33, 52	
4	Wed	9/11	2.2 Set Operations	A 2.2 pp 101-106 # 6, 13, 16, 47, 50	
5	Fri	9/13	8.3 Proportional Reasoning Recitation: Present Sheet 1 & 2	A 8.3A pp 423-426 # 10, 11, 16, 22, 29	Chapter 2 Quiz
6	Mon	9/16	8.3 Proportional Reasoning	A 8.3 B pp 423-426 # 30, 39, 42, 48, 50	
7	Wed	9/18	8.3 Proportional reasoning	A 8.3 C Handout	
8	Fri	9/20	Division of Fractions with LCD; Greg Tang fractions Recitation: Present Sheet 3	A 8.1 A Handout	Chapter 8.3 Quiz
9	Mon	9/23	8.1 Fractions, Decimals and Percents	A 8.1 pp 396-399 # 16, 23, 25, 35, 48	
10	Wed	9/25	8.2 Fractions, Decimals and Percents	A 8.2 pp 412-414 # 10, 14, 22, 27, 31	Portfolio Checkpoint #1

11	Fri	9/27	8.4 Fractions, Decimals and Percents in the Real World Recitation Present Sheet 4	A 8.4 pp 438-441 # 18, 22, 24, 42, 62	
12	Mon	9/30	Ch. 9.1 Algebraic Thinking – Numerical Sequences	A 9.1 pp 464-466 # 10, 19, 28, 33, 40	
13	Wed	10/2	Review for Exam #1	Study for Exam #1	
14	Fri	10/4	EXAM #1		
15	Mon	10/7	9.2 & 9.3 Functions – Linear & Nonlinear	A 9.2 pp 479 - 483 # 30, 43, 47 pp 496-499 # 17, 42	
16	Wed	10/9	9.4 Solving Equations 9.5 Modeling	A 9.4 pp 509-512 # 15, 20, 39 A 9.5 pp 524 - 528 # 11, 21	
17	Fri	10/11	14.1 Data Recitation Present Sheet 5	A 14.1 pp 850-852 # 12, 15, 22, 25, 32	
	Mon	10/14	COLUMBUS DAY - CLASS CANCELLED!!		
18	Tues	10/15	MONDAY CLASSES MEET 14.2 Represent & Analyze Data	A 14.2 pp 865-870 # 12, 17, 24, 27, 35	
19	Wed	10/16	14.3 Represent & Analyze Data	A 14.3 pp 887-892 # 12, 14, 16, 34, 44	Portfolio Checkpoint #2
20	Fri	10/18	14.4 Abuse of Statistics Recitation Present Sheet 6	A 14.4 pp 901-905 # 12, 16, 22, 33, 39	
21	Mon	10/21	15.1 Probability	A 15.1 pp 927-931 # 10, 18, 29, 37, 48	
22	Wed	10/23	Review for Exam #2	Study for Exam #2	
23	Fri	10/25	EXAM #2		

24	Mon	10/28	NO CLASS - WORK ON YOUR PORTFOLIOS!!		
25	Wed	10/30	15.2 Theoretical Probability 15.3 Odds	A 15.2 pp 945-949 # 12, 16, 39 pp 958-960 # 6, 32	
26	Fri	11/1	15.4 Counting Recitation Present Sheet 7	A 15.4 A pp 975-978 # 17, 31, 36, 40, 52	
27	Mon	11/4	15.4 Counting	A 15.4 B Handout	
28	Wed	11/6	11.1 Congruence	A 11.1 pp 625-628 # 14, 20, 26, 34, 46	
29	Fri	11/8	11.2 Similarity and Self-similarity Recitation Present Sheet 8	A 11.2 pp637-642 #8, 10, 19, 37, 45	
	Mon	11/11	VETERANS DAY- CLASS CANCELLED		
30	Wed	11/13	12.1 Coordinate Geometry	A 12.1 pp 689-693 #10, 14, 21, 46, 50	Portfolio Checkpoint #3
31	Fri	11/15	12.2 Transformations Recitation Present Sheet 9	A 12.2 A pp 708-713 # 11, 15, 17, 19, 21	
32	Mon	11/18	12.2 Transformations	A 12.2 B pp708-713 # 23, 25, 29 31, 33	
33	Wed	11/20	12.3 Congruence w/ transformations	A 12.3 pp 726-731 # 19, 21, 37, 43, 53	
34	Fri	11/22	12.4 Geometric Patterns & Tessellations Recitation Present Sheet 10	A 12.4 A pp 742-745 #8, 16, 19, 24, 26	
35	Mon	11/25	12.4 Tessellations	A 12.4 B Handout	
	Wed	11/27	THANKSGIVING RECESS - CLASS CANCELLED		
	Fri	11/29			

36	Mon	12/2	12.4 Tessellations	A 12.4 C Handout	
37	Wed	12/4	Review for Exam #3	Study for Exam #3	Final Portfolio due
38	Fri	12/6	EXAM #3		
39	Mon	12/9	Last Day of Class Review for Final	Study for Final	
		TBA	FINAL EXAM		

******* FINAL EXAM: TBA *******