

“Teaching is not brain surgery; it is far more complex and difficult to practice effectively.” --J.S.C.

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JWB 213

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Class	Dates	Time	Meeting pattern	Meeting space
4090	1/12-3/12	7:30 – 9:00	TH	LCB 121
4095	3/23-27, 4/6-17	7:30 – 9:15	MTWHF	East High/Bryant Middle
4095	3/30 – 4/3	7:30 – 9:15	MTWHF	LCB 121
4090	4/20 – 4/28	7:30 – 9:00	MTWHF	LCB 121

Course website: <https://sites.google.com/site/methods4090sp15/>

Office hours: We will generally be available after class, but also by appointment.

Required Materials

- Cangelosi, J.S. (2003). *Teaching mathematics in secondary and middle school: an interactive approach* (3rd ed.). Upper Saddle River, NJ: Prentice-Hall, Inc.
- Utah Core State Standards - <http://www.schools.utah.gov/CURR/mathsec/Core.aspx> or <http://illustrativemathematics.org>

Summary of Course

Math 4090 is an invitation to the academic culture of the mathematics teaching profession. You will learn research-based techniques and strategies that lead secondary school students to discover, create, appreciate, and utilize mathematics. The rationale for the course is further articulated in the preface of our textbook. You will learn how to create and implement lessons, keep students engaged, and comprehend the vision of the Utah Core State Standards mathematics curriculum.

The following is an excerpt from the syllabus for the equivalent course at the University of Michigan given by Patricio Herbst, which we wholeheartedly support:

Across all of those activities that we will discuss, learn, and practice, there are two general, cross cutting themes. One of them is the need to use (and, actually, develop) our knowledge of the discipline of mathematics in order to teach mathematics for understanding. Your study of mathematics has hopefully prepared you to understand difficult mathematical ideas and to propose and solve interesting problems. You have also become aware of what it means to do mathematics and what mathematics is as a discipline. We expect you to use your knowledge of and skills in advanced mathematics (and not the least, your love of mathematics as well as of children) to look at how this

¹ [but always email instead]

² [but always email instead]

beautiful discipline can be taught and to decipher what students think. From the perspective of a student majoring in mathematics in college, the ideas of school mathematics may look straightforward. Yet, to be able to teach those ideas in a way that honestly represents the nature and the value of the discipline, as something that makes sense, that can be understood and used, is not an easy task. This course will help you think about how mathematical ideas can be developed and used in school in ways that honestly represent the discipline of mathematics.

A second, general theme that pervades this course is to learn how to use the mathematics class as a place for the cultivation and public exercise of the intellect of all children. Part of what it means to be educated includes to be able to state one's point precisely, to assert one's right to think before committing an opinion, to argue one's point, as well as to listen to others, to be convinced if their argument is compelling, or if one disagrees to be able to know what it is that one disagrees with, etc. Part of what it means to learn to live in a democracy means that you learn to require and accept good reasons for doing things, rather than submit to or exercise authoritarianism. Mathematics can be great training grounds for students to learn to rely on reason, a true instrument of democratization. But, sometimes it fails to serve that purpose... Many of those intellectual and civil qualities are at stake when we teach, and we need to learn how to foster them. How can we make our mathematics class into one that promotes intellectual diversity and that celebrates humanity at the same time that we teach the curriculum.

Math 4090 is not a panacea for teaching mathematics. You will not magically become a good math teacher after taking this class. In fact, even after you have taught for a couple of years, you will probably think that you are a terrible teacher, and you will have a long list of areas in which to improve. If, even after many years of teaching, you do not think that you have room for improvement, then you actually are terrible.

Contrary to growing popular opinion, math education is not about preparing children for college nor careers. Should college or vocational preparation be a result of your teaching, great; but the philosophy of education is much larger and deeply important than that. (Study the comic (from www.xkcd.com) and its mouseover text below.)



IT'S WEIRD HOW PROUD PEOPLE ARE OF NOT LEARNING MATH WHEN THE SAME ARGUMENTS APPLY TO LEARNING TO PLAY MUSIC, COOK, OR SPEAK A FOREIGN LANGUAGE.

Mouseover text:

"The only things you have to know are how to make enough of a living to stay alive and how to get your taxes done. All of the fun parts of life are optional."

A question for you:

Why do students relentlessly demand their teachers justify their learning of mathematics, but not their learning of other subjects?

Another great Randall Munroe quote

"I never trust anyone who's more excited about success than about doing the thing they want to be successful at."

Assignments and Grade Determination

Assignments and handouts will be posted on the course website after each class—look in there for assigned readings and homework in case they change (and they will) from our original plans. We are going to assume that you have access to the internet and will receive all communications sent to the email address you provide us on the first day of class. You are most welcome to provide feedback, written or oral, personal or anonymous. There is a link on the course website that will allow you to do any of those.

- Homework (20%)

You will be assigned extensive homework almost every day of class. Assignments typically include about 50 pages of reading followed by thoughtful reflective writing. Each homework must be posted on your website by midnight on Sunday before the class meets. This is so that Maggie and Emina can review your work in preparation for discussion during the next class.

- Opportunities (20%)

Your opportunity to demonstrate what you learned will vary. We will have two written assessments, and two oral assessments. The written assessments will be announced a week ahead, but you can expect them in the second portion of the class. Oral assessment will be scattered throughout the semester, and there will be no formal announcement.

- Lesson Plans and Presentations (20%)

You will create lessons based on what you will learn from Chapters 5 – 8, and you will present each to a subset of the class.

- Unit Plan (10%)

You will create a unit plan of your choice, in accordance with Chapter 4 and cross-referenced with the Utah Core. The draft will be due on February 19th and final version will be due on April 16th.

- 6-12 curricular content presentation (10%)

You will also prepare presentations of mathematics content from which will demonstrate your understanding of the material you will be responsible to teach.

- Attendance (10%)

This course should be treated as your teaching job. You will not skip going to school without notifying your administration and preparing adequately for your day away; likewise, this semester you will be prepared for every class as if you were teaching it.

- Final presentation (10%)

You will compose a presentation that illustrates the growth you've made during the semester's work. This may take a form of a lesson, a video of a portion of a lesson, discussion of an activity you have created, and a brief reflection on why you've chosen to present that particular content. The presentation should contain both mathematics and reflect your knowledge of the methods for teaching that mathematics.

What to Expect During Class Meetings

During the semester, we will read nearly the entire textbook and our routine will correspond to the following rough agenda:

1. Exploration of a Secondary Mathematics Activity
2. Discussion of Assignments and Readings
3. Portfolio Development
4. Presentation of Lessons/content/assessments

Use of internet in this class

Internet is an awesome resource and you should use it. However, you would not be happy if your students looked up the solution of their homework problems online, and neither will we. You can search for inspiration, and for ideas, but the work you submit and present should be your own. From the Student Code: “Plagiarism” means the intentional unacknowledged use or incorporation of any other person's work in, or as a basis for, one's own work offered for academic consideration or credit or for public presentation. Plagiarism includes, but is not limited to, representing as one's own, without attribution, any other individual's words, phrasing, ideas, sequence of ideas, information or any other mode or content of expression.

ADA 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.

Important dates³:

Classes begin	Monday, January 12
Last day to drop (delete) classes	Wed., January 21
Last day to withdraw from classes	Friday, March 6

³ All others will be decided listed in the schedule