

# Education 450: Advanced Methods for Teaching Mathematics

Texts:

(R) Liping Ma Knowing and Teaching Elementary Mathematics (1999)  
ISBN: 9780415873840

(O) Sousa, David. A. How the Brain Learns Mathematics (2015) Crown Press ISBN 13: 978-1-4833-6845-0

You also have a PDF file to download that will be your main text!



Term: Fall 2021

Instructor: Dr. Chris Cain

Office/Office Hours: Posted and by appointment

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Course Description:

This course is designed to introduce candidates to the knowledge, skills, and procedures needed to provide effective mathematics instruction to all students. The principles, techniques, methods, and strategies presented in this class are based on research-validated instructional strategies. In this course candidates will learn to use assessment results to develop instruction that builds mathematical connections.

Candidates in this course investigate current practices, research, and instructional strategies in teaching mathematics.

# GOALS:

MY Goals: Through the readings, discussions, and activities offered in this course, candidates will develop and demonstrate:

- A. a knowledge base for NCSCOS
- B. the principles of mathematics instruction for ALL students
- C. principles of learning when selecting and implementing research-based learning and instructional approaches.
- D. an understanding of effective teaching for ALL students
- E. an understanding of effective learning environments.
- F. skill in using assessment data in the classroom
- G. the ability to implement a variety of research-validated, peer-reviewed teaching methods for mathematics and content area instruction.
- H. the importance of working with paraprofessionals, students' families, as well as how to create a safe environment that will enable diversity, respect, fairness, and will allow students to take risk.
- I. the big ideas (form of a number, equality, numeration, algebraic and geometric application, proportional reasoning, etc.) of mathematics instruction.
- J. the importance of language with mathematics instruction for all children.

# YOUR GOALS???

# Major Assignments:

1. Observations / Ed.TPA student assessment
2. Group Work
3. Journal Article Reviews
4. Discussion Questions / Learning Tasks
5. Formal Assessment Opportunities

## Observations / Ed. TPA Student Assessment:

Candidates get to be in the classroom for 7-10 hours of observation, assessment, implementation teaching of continuous series of daily instructional lessons as they complete a mock edTPA and get to put into practice the ideas and skills from this class.

**A.** Select a student who is struggling in mathematics as compared to his/her peers.

**B.** Administer the Number Knowledge Test, annotating the recording sheet diligently.

**C.** Make certain to read and refer to the "Directions for Administration" for help in administering and interpreting the assessment.

**D.** Complete the Math edTPA: Mathematics Assessment Task 4, you will analyze student work samples to identify a targeted learning objective/goal and plan and teach a re-engagement lesson focused on students' needs. This task and the evidence you provide are framed by your understandings of your students and their learning.

**E.** Attachment in Moodle: edTPA Task 4 Handbook Project should be used as a guide along with additional directions.

## Group Work:

Candidates will work in collaborative groups to discuss real-world issues

## Journal Article Reviews:

Candidates will read one journal article each week. Reviews focus on mathematics instruction in the classroom and should be shared with classmates.

## Discussion Questions / Learning Tasks:

Candidates will participate in required reading, assessment, planning, and observations, in order to answer discussion questions and follow through on group learning tasks assigned throughout the semester. This task builds an understanding to allow the candidate to provide instruction in the essential components of math instruction. These are outlined as Level 1 in your handouts.

## Formal Assessment Opportunities:

Here you get to show off what you are learning and how you are connecting this to the real world of the classroom.



## **Course Policies and Evaluation Procedure:**

Attendance is required for all class sessions. You are now involved in your professional sequence of courses, keep in mind that your attendance, promptness, and preparation for class are a reflection of your commitment to professionalism. The knowledge and insights gained through active involvement in class discussions and activities are essential in meeting the course objectives. Students in this course are expected to adhere to the principles of the Mars Hill College Honor Code.

### **Evaluation:**

Gains from Pre -Post Assessments	10%
Participation	15%
Observation and Ed. TPA	40%
Journal Articles Reviews	10%
Discussion Questions / Learning Tasks	25%

**WHAT WOULD YOU LIKE TO CHANGE / MODIFY:**

**Let's Talk about Due Dates together!**

### **Grading Scale:**

<b>A:</b>	<b>93-100%</b>
<b>A-:</b>	<b>90-92.9%</b>
<b>B+:</b>	<b>87-89.9%</b>
<b>B:</b>	<b>83-86.9%</b>
<b>B-:</b>	<b>80-82.9%</b>
<b>C+:</b>	<b>77-79.9%</b>
<b>C:</b>	<b>73-76.9%</b>
<b>C-:</b>	<b>70-72.9%</b>
<b>D:</b>	<b>65-69.9%</b>
<b>F:</b>	<b>&lt; 65%</b>

**TEP dispositions:** Education students are held to high professional standards throughout their time in the Mars Hill University Teacher Education Program. Indeed, as a pre-professional program, we hold students to the standards expected of professional public educators in the state of North Carolina. As such, your demonstration of professional dispositions is important to your success not only in this class but in the entire teacher education program. Although professional dispositions are only formally assessed at admission to the program and admission to student teaching, professional dispositions are a factor in every education class you take. If you demonstrate a pattern of behavior that is inconsistent with the professional dispositions expected of a pre-professional educator at Mars Hill University, you will be placed on an action plan so that we can be clear about our expectations and you can work to meet them and remain a student in good standing in the Teacher Education Program.

### **My Netiquete Statement:**

It is my sincerest intention to help you in any way I can. I want you to be successful in the course, and for that reason and many others, I will respond to your emails most often within 24 hours. However, please be advised I have many students and teach many classes. Therefore, I ask that you are as efficient and polite in your emails as possible. Regarding efficiency, please email from your college account, include an appropriate subject line, the course and section number, the name of the assignment you're asking about (if that's what you're doing), and as many specifics as possible, so that I can understand your question and respond quickly. Regarding politeness, please address me by name, include a greeting, be respectful in your language, and sign the email with your own name. Although it will pain me to do so, I reserve the right to delete, and not respond to, any emails that do not adhere to this policy. However, you are more likely to receive a response that simply states: Note the email policy on the syllabus. At which point, you will read this and hopefully respond with an efficient and polite email. Finally, it would be wise to embrace this policy for communication with other instructors and members of academic and professional communities.

**Recording Policy:** Due to privacy concerns, students may not record (photography, audio, or video) any portion of the class meeting without prior permission from the course instructor.



## Values:

This is a place of community where all are welcome and respected.

This is a safe place. We will all try to watch out for each other; however, if you feel unsafe please tell someone.

This is a place of civility and kindness toward each other.

We see color, gender, sexual orientation, and all the other things that make us uniquely us, as we continue to learn the value of difference.

We care for ourselves.



**Accommodations** for students with disabilities: Sample Statement: The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities.

If you have an Academic Accommodation Plan (AAP) issued through MHU Disability Services, please arrange a time to present your plan and to discuss your specific accommodation needs. If you believe you have a disability requiring an accommodation and do not have an approved AAP, please contact Judith Harris, MHU Disability Services Coordinator, located in the Libray or at [Judith\\_Harris@mhu.edu](mailto:Judith_Harris@mhu.edu)

The Office of Diversity, Equity, & Inclusion (ODEI) works to ensure that diversity, equity, and inclusion remains a focused core standard at MHU. The ODEI advocates, advises and promotes initiatives that foster an understanding and support of diversity, equity and inclusion among the students, staff and faculty of the MHU community. This is an understanding that recognizes that MHU students, staff and faculty have diverse backgrounds including but not limited to race, creed, color, sexual orientation, religion, and disability status. For more information, questions or concerns email the Director of ODEI Jonathan McCoy at [jonathan\\_mccoy@mhu.edu](mailto:jonathan_mccoy@mhu.edu)

Statement on student wellness: Mars Hill University offers free, confidential counseling for its students through the MHU Counseling Center to provide support for a positive university experience. For more information or to schedule an appointment for a consultation, email the Director of Counseling.

## Basic Needs Statement

I recognize that all humans have basic needs that include physical safety, food and shelter, and community and belonging. I realize that it is difficult to engage in learning if you have concerns about these needs. Similarly, if you are struggling with transportation, with childcare, with — heck, anything: Let me know. I will try to help.

In addition to fostering your academic growth as a MHU student, I consider it part of my role as an instructor to recognize the basic needs of students and when necessary, help connect students with campus and community resources to meet their basic needs. If at any time you have difficulty meeting your needs please email me at: [ccain@mhu.edu](mailto:ccain@mhu.edu) or approach me after class or during office hours, and I will help in any way I can. By recognizing your own needs and seeking solutions to ensure your success as part of our learning community, you are being an advocate for yourself. We have resources on campus to help.

### Students Rights and Responsibilities:

As a student at Mars Hill University, you have certain rights and responsibilities. MHU students should strive for their actions to reflect the values of the university and bring credit them, their families, community, and the university. No matter where you are, you are part of our community, this includes on university premises, at university- sponsored activities, and off-campus.

For more information about our Code of Conduct and the Student Bill of Rights please refer to the [Student Handbook](#).

- **Mars Hill University Honor Code**

We, the students of Mars Hill University, pledge ourselves to uphold integrity, honesty, and academic responsibility in and out of the classroom.

- **Mars Hill University Honor Pledge**

On my honor, I have neither given nor received any academic aid or information that would violate the Honor Code of Mars Hill University.

### Handling of Violations of Academic Integrity

When there are possible violations of academic integrity, the MHU Academic Integrity Guidebook outlines procedures for: 1) classifying the violation into one of three possible categories (minor, standard, and major), 2) reporting possible violations, 3) appealing reports of violations, and 4) how reported violation records will be kept. See the MHU Academic Integrity Guidebook for full descriptions of these procedures.

Longer version of the policy may be found at: <https://my.mhu.edu/course/view.php?id=20#section-5>