

CALIFORNIA STATE UNIVERSITY, EAST BAY
Department of Teacher Education
TED 5390: Mathematics Methods
Summer 2015

Schedule:

Mondays: 6/22, 6/29, 7/6, 7/13, 7/20
1:00-5:00 pm
AE 153

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AE319

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Course Description: Introduction to theory and practice of instructional methodology in a single subject classroom.

Goals: This is the first of a 4-course sequence focused on mathematics teaching and learning. The course sequence is designed to create an opportunity for sustained learning and professional growth. The goals for the year are to help you:

- Increase your knowledge of mathematics and mathematics pedagogy
- Examine your own knowledge, beliefs, and assumptions about mathematics, teaching and students
- Increase your theoretical knowledge and practical experiences in planning, teaching, and assessing mathematics
- Understand the mathematical needs of a diverse range of students
- Understand the complexities of diverse, multi-ability classrooms while broadening your repertoire of teaching strategies
- Learn from your experiences in schools through informed reflection

These courses will lay the groundwork for continued professional development throughout the candidate's teaching career within the guidelines of the California Standards for the Teaching Profession, <http://www.ctc.ca.gov/educator-prep/standards/CSTP-2009.pdf>. In addition, although we will explore a range of approaches, this course is primarily oriented towards a "sense making" approach, in which learning is taken to be the meaningful connections that students make among math concepts and ideas, efficient algorithms, notation, procedures, as well as mathematical practices such as problem solving and constructing viable arguments. These meaningful connections are built over time through designed classroom experiences. Math teaching is the work of creating and sustaining these experiences so that students build these connections around important mathematical ideas. Skilled mathematics teaching creates and sustains these experiences with all students regardless of demographics or prior achievement.

(For Linked Learning Revisions) During the TED 5390 Summer 2015 course, the activities and assignments in blue text will be added to the current syllabus.

1. Explicit discussion of careers in math as well as the role of the Standards for Mathematical Practice from the Common Core State Standards in careers and activities that are directly and indirectly tied to math-related fields. This is relevant to the current class discourse on misconceptions about teaching math and STEM fields.

2. Addition of readings addressing careers that utilize math, with a related assignment in which candidates identify activities that are tied to math-related careers and design a lesson to introduce the topic to their students.

Objectives: The students will be able to:

1. Plan a mathematics lesson giving consideration to the following:
 - a. Opportunities for *all* students to engage in the CCSS Standards for Mathematical Practice
 - b. Eliciting student reasoning
 - c. Incorporating strategies to provide access to the mathematics for all students
 - d. Connecting to students' prior knowledge
 - e. Assessing student understanding of the material
 - f. Using class time efficiently
2. Pose meaningful questions that encourage active thinking and participation by all students.
3. Model problem solving instruction using a strategies approach.
4. Discuss curricular issues in the secondary mathematics program.
5. Modify existing curricular materials to create a balance between procedural fluency, conceptual understanding, and application, as called for in the CCSS.
6. Use tools such as graphing calculators, dynamic software, and concrete manipulatives as instructional aides for learning mathematics.
7. Construct appropriate assessments for daily or weekly quizzes, chapters, units and semesters.
8. Conduct formative and summative evaluation of student understanding and provide appropriate feedback to students.
9. Model classroom management techniques and procedures appropriate to the district's assignment.
10. Plan and employ remediation techniques for students who are struggling in mathematics.

College of Education and Allied Studies Theme

The theme of the College of Education and Allied Studies is "Preparing leaders committed to social justice and democracy." This course relates to the College theme by helping future teachers learn to teach mathematics to *all* students, with particular focus on providing access to students from traditionally under-served groups, in order to provide access to future career and educational opportunities and to use mathematics as a lever for social change.

Evaluative Criteria:

A letter grade will be given for this course. The following types of projects or assignments will be given:

- I. Complete assignments given by the instructor and lesson plans for the student teaching assignment.
- II. Prepare and teach specified lessons to a small group of other student teachers.
- III. Make and/or use mathematical manipulatives for teaching specified concepts.
- IV. Do presentations of problem solving ideas to the class.
- V. Discuss pros and cons of various curricular issues in secondary mathematics today.
- VI. Design tests or quizzes for specified content appropriate to the student teaching assignment.
- VII. Develop content ideas for teaching specific concepts.

Required Readings: Most required readings will be taken from the course reader with the exception of professional journal readings as chosen by the student. In addition, short reading assignments related to class topics will be posted for download on the Blackboard website. These will be posted throughout the semester and reading due dates will be indicated on the syllabus.

Recommended:

- Join NCTM: www.nctm.org/membership (\$40 for Student E-Membership subscription and journals).
- Join youcubed: www.youcubed.org
- Subscribe to Dan Meyer's blog: <http://blog.mrmeyer.com/>

Note: Attendance and active participation at all classes is expected. Absences due to illness or emergencies need to be made up. Contact me before the class preferably or after class if necessary to get a make-up assignment. Any in-class assignments not made up will result in a 5 point deduction for 5390 and 5 points will be deducted from your class participation grade for absences.

Grading Scale for 5390:

94-100%	A	77-79%	C +
90-93%	A -	73-76%	C
87-89%	B +	70-72%	C -
83-86%	B	60-69%	D
80-82%	B -	Below 60%	F

Evaluation policy for 5390:

Journal Article Summary	15
Lesson Plans	20
Reading Responses	20
Management Response	20
<u>Class participation</u>	<u>25</u>
TOTAL	100

Posting Assignments:

All assignments should be posted to the appropriate folder on Blackboard using the format shown below:

- Course number_your last name_assignment
- Example: 5390_McNamara_Week 2 Response

Earthquake Emergency Information for students at C.S.U., Hayward:

During the earthquake: Duck and cover -- Get under a desk or table. Protect your head with your arms. Do NOT exit building; objects may fall from roof. Do NOT use elevators. After the shaking stops: Remain calm. Think about a way out. Check for potential hazards. When safe, evacuate to an open area. Assemble at the Outdoor Amphitheater where you will receive further information. Use telephone (3333) only for genuine emergencies. Expect aftershock.

Tentative Outline of Topics:

- Session 1:** 6/22
- Course Overview and Introductions
 - Teaching Mathematics in 2015
 - Introduction to the Common Core State Standards for Mathematics
- Assignment: Reading Response**
Assignment: Journal Article Summary (due in 2 weeks)
- Session 2:** 6/29
- CCSS Standards for Mathematical Practice
 - Providing Access to All Students
 - Student Identity
- Assignment: Reading Response**
Assignment: Lesson Plans (due in 2 weeks)
- DUE:**
- Reading Assignment: Course Reader pp. 18-44
- Session 3:** 7/6
- Unpacking the Content Standards
 - Using Class Time Effectively
 - Lesson Planning
- Assignment: Reading Response**
Assignment: Management: Plan for Getting to Know Your Students (due in 2 weeks)
- DUE:**
- Reading Assignment: Course Reader pp. 45-65
 - Journal Article Summary
- Session 4:** 7/13
- Unpacking the Content Standards, continued
 - High-Level Tasks
 - “Upside-Down Teaching”
- Assignment: Reading Response**
- DUE:**
- Reading Assignment: Course Reader pp. 71-106 and 139-142
 - Lesson Plans
- Session 5:** 7/20
- Constructivism
 - *“When will I ever use this?”*
 - Setting the Tone: Starting the Year
- Heads-up (Assignment for 5392): Attend a Professional Conference and Complete Write-up**
- DUE:**
- Reading Assignment: *“Basing a Career on Base Two”* and *“Building a Career Mathematics File: Challenging Students to Find the Importance of Mathematics in a Variety of Occupations”* (see pp. 5 for response format)
 - Video: Watch *“Blow Minds: Teach STEM”* at <http://blowmindsteachstem.com>
 - Management: Plan for Getting to Know Your Students

No Final Exam

Note: Our Calendar is subject to change!

Assignments:

In addition to attending each session and participating in all activities, you will be expected to complete the following:

1. Professional Journal Article Summary

- a. Select an article from an educational journal of your choice (suggested journals are *Mathematics Teaching in the Middle School* and *Mathematics Teacher*, both published by NCTM). Articles published prior to 2010 are available for download from the CSUEB library. Contact me for access to articles published after 2010.
- b. Write a summary of the article that includes the following:
 - i. An overview of the article, including name of article, author(s), and name of journal
 - ii. The author's main point in writing the article
 - iii. How does the information in the article impact teaching?
 - iv. How does the information in the article impact learning?
 - v. Why did you select this article?

2. Lesson Plans

- a. You will select a topic that you might teach someone and write two lesson plans **for the same topic.** (Your topic does not have to be math related.)
- b. One version will follow the Five-Step Lesson Plan format shown on pp. 90-91 in the course reader.
- c. The other version will follow the CCSS Mathematical Practices Lesson-Planning Tool shown on pp. 98-103 in the course reader.

3. Reading Responses

- a. You will write a response for the readings assigned for Weeks 2, 3, and 4. Submit each of these assignments to the appropriate folder on Blackboard.
- b. Each response will follow the same format-
 - i. I appreciate....
 - ii. I learned.....
 - iii. I wonder.....
- c. For readings assigned for Week 5, complete the following:
 - i. Chose three of the courses listed below. Identify a Mathematics Career task for each of the three courses. (The three tasks must be different from each other and may not be the same ones included in the Career Mathematics File article.)

1. Grade 6	5. Geometry
2. Grade 7	6. Algebra 2
3. Grade 8	7. Pre-calculus and Trigonometry
4. Algebra 1	8. Calculus
 - ii. Write a lesson plan (using the lesson plan format of your choice) to introduce students to one or more fields in which mathematics plays a substantial role.

4. Management: Plan for Getting to Know Your Students

- a. Create a plan for getting to know your students during the first week of school. Your plan may include a survey, questionnaire, graphs, interviews, etc.
- b. Discuss how this plan will support your classroom management goals and your classroom rules.

SECONDARY MATHEMATICS METHODS
Professional Meeting Assignment

Your Name: _____

Name of Meeting Attended: _____

Location: _____

Date: _____

Write a one paragraph description of the session or sessions you attended.

Write one paragraph describing a teaching idea that you got from the session.

Attach a meeting agenda, syllabus or schedule and a copy of any other materials from the session.