

MATH 324

Methods and Material in Mathematics – Secondary

Winter 2010

General Information

Instructor(s): Mark Oursland

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Meeting Time: M,T,W,Th 11:00-11:50 AM

Location: Science 115

Office Hours: Dr. Oursland: M-Th 9:00-10:00AM

Course Description

Prospective teachers will learn and use the methods and materials needed to teach secondary school students mathematics with emphasis on standard-based curriculum, problems solving, teaching for understanding, equity, and research-based practices.

Prerequisites

The prerequisites are MATH 299E and EDCS 311 or instructor permission.

Course Rationale

Curriculum and Evaluation Standards for School Mathematics (NCTM, 2000) outline specific changes needed in pre-service mathematics education. To meet the expectations of national stakeholders, pre-service candidates must develop knowledge, skills, and dispositions that enable the best K-12 teaching and learning possible. This will be influenced by the latest brain research and the use of best practices in mathematics. Since many teachers will teach as they were taught, it is crucial that pre-service training include both elements. In particular, effective learning will take place when student(s) (a) preconceptions are engaged, (b) they do activities consistent with professionals in the field, and (c) they are aware of how (and what) they learn. Research indicates the best learning is based on discovery via inquiry and collaborative problem solving in balance with direct instruction. Therefore, your training as future professional educators will emphasize these elements.

Required Course Materials

- Blackboard account with enrollment in MATH 324
- LiveText C1 account
- Handouts provided by the instructors
- Access to Washington State Academic Learning Requirements for Math
<http://www.k12.wa.us/CurriculumInstruct/default.aspx>
- Access to the National Council of Teachers of Mathematics standards at <http://www.nctm.org> (free 90-day membership)

Learner Outcomes and Assessment

By the end of the course, students will:

| Outcomes | Assessment | Standards |
|---|--|------------|
| be able to explain what good mathematics teaching is and how student learn mathematics. | Philosophy of Teaching Mathematics and How Students Learn Mathematics Papers, and Livetext Portfolio | NCTM 1- 16 |
| be able to demonstrate each of the following disposition of teaching mathematics: attention to equity, create a stimulating curriculum, effective teaching, learning with understanding, and use of various assessments. | Dispositions of Teaching Secondary Mathematics Wiki and Livetext Portfolio | NCTM 7 |
| be able to effective use the following teaching practices to impact student learning: differentiate instruction, manipulatives, multiple strategies to instruct and assess students, align curriculum with state standards, | Four individual and one group lesson plan, unit plan, teaching in a local classroom, and livetext portfolio. | NCTM 8 |

| | | |
|---|--|----------|
| be able to explain how they will use and participate in the professional community of math teachers to become better teachers. | Four individual and one group lesson plan, unit plan, teaching in a local classroom, and livetext portfolio. | NCTM 8.5 |
| be able to apply appropriate technology and resources to promote problem solving and effective learning. | Four individual and one group lesson plan, unit plan, teaching in a local classroom, and livetext portfolio. | NCTM 8.9 |
| be able to use problem solving in lessons to promote sufficient rigor and interest to improve student engagement, motivation, and cognitive demand. | Four individual and one group lesson plan, unit plan, teaching in a local classroom, and livetext portfolio. | NCTM 8.8 |
| be able to interact with a classroom teacher to develop and teach a lesson in a secondary mathematics classroom. | Teach a lesson in a local school and livetext portfolio | NCTM 16 |

The instructional and assessment strategies for this course are designed to inform you of your progress in achieving the performance outcomes. The instructors will give you feedback on your progress in meeting performance outcomes.

| Assignment | Points |
|--|--------|
| Philosophy of Teaching Mathematics Paper (25 points) | 25 |
| How student learn mathematics Paper (25 points) | 25 |
| Classroom Management Plan and Parent Letter (25 points each) | 50 |
| Participation in Community of Math Education Professionals (25 points) | 25 |
| Lesson Plans – 4 total (redo until satisfactory – points are for meeting deadlines) 3 individual and 1 collaborative (Integrated) | 40 |
| Field Observations (self, peer, instructor) | 60 |
| Unit Plan (100 points) | 100 |
| Disposition of Teaching Mathematics Wiki (50 points) | 50 |
| Reflection on wiki writing about disposition of teaching math | 25 |
| Portfolio | 100 |
| Total Points | 500 |

Grading Scale

93-100% (A), 90-92.9% (A-), 87-89.9% (B+), 83-86.9% (B), 80-82.9% (B-), 77-79.9% (C+), 73-76.9% (C), 70-72.9% (C-), 67-69.9% (D+), 63-66.9% (D), 60-62.9% (D-) and 0-59.9% (F). Please see the CWU Catalog for the eligibility requirements for an incomplete (I).

Performance Expectations

Professionalism

When in public schools, students are expected to behave as competent and respectful teaching professionals. Professional dress (no heavy perfumes or cologne), timeliness, and being well prepared are minimum expectations. Be at your school well before classes begin. Professionalism will be assessed as part of your grade.

Schedule

The class calendar is tentative due to subject to change, but will be our tentative guideline for the course. If you miss a class, it is your responsibility to find out what was covered, announced, or assigned. In case of emergencies, it is your responsibility to contact the instructors as soon as possible. If a course deadline was missed, assessment alternatives are left up to the discretion of the instructors.

Suggestions for Success

Take responsibility for your own achievement. If you have questions regarding any assignment, ask the instructors. Communicate frequently.

ADA Statement

Students with special needs or disabilities who desire academic accommodation are encouraged to submit a copy of the 'Confirmation of Eligibility for Academic Adjustments' from the Disability Support Services office as soon as possible so a plan can be developed that best serves the learning needs of the student. Students without this form should contact the Disability Support Services office in Bouillon 205 at 963-2171 or dssreceipt@cwu.edu as soon as possible.

Tentative Schedule

| Week | Topics | Assignment |
|--------|---|---|
| Jan 4 | Intro, syllabus, Challenge of Teaching Mathematics, How student learn math | Philosophy of Teaching Math Paper How Student Learn Math Paper |
| Jan 11 | Classroom management and parent participation, Wiki writing about dispositions teaching math | Classroom management plan, Parent letter, wiki writing |
| Jan 18 | Using resources and participating in a professional learning community of mathematics educators | Professional Participation Plan |
| Jan 25 | Teaching: Curriculum and aligning standards, instruction, and assessment | Unit Plan |
| Feb 1 | Teaching: Guided discovery, manipulative, and multiple assessment methods | Lesson Plan 1 |
| Feb 8 | Teaching: Direct instruction and differentiation | Lesson Plan 2 |
| Feb 15 | Teaching: CRAFT lesson, problem solving, and multiple instructional methods | Lesson Plan 3 |
| Feb 22 | Teaching: Integrated and use of technology | Lesson Plan 4 |
| Mar 1 | Reflection on disposition of teaching math and unit plan | Reflection on wiki writing and unit plan assessment |
| Mar 8 | Construction and Revision of Portfolio and field teaching | Final Portfolio and field teaching assessments |
| Mar 17 | Complete All Coursework | |