

Principles of Calculus for Middle Level Teachers (MATH 274)

Winter 2009

General Information

Instructor(s): Mark Oursland

Office: Bouillon Hall 107B

Phone: 963-2100

Email: oursland@cwu.edu

Meeting Time: M, W, F 2:00-2:50pm

Location: Hertz 120

Office Hours:

Dr. Oursland: 10:00 to 11:30 AM M, W, F

Course Description

Prospective teachers will learn and use the concepts of calculus in a discovery and inquiry approach. The instructor will initiate new topics with classroom inquiry and connection to the middle level curriculum. Through classroom discourse, practice problems, daily quizzes, project papers, and exams students will show their ability to apply calculus concepts in multiple context and formats.

Prerequisites

The prerequisites are MATH 153 and MATH 154 or instructor permission.

Course Rationale

Curriculum and Evaluation Standards for School Mathematics (NCTM, 2000) and *National Middle School Association* (NMSA) outline specific changes needed in pre-service mathematics. To meet the expectations of national stakeholders, pre-service candidates must develop knowledge, skills, and dispositions that enable the best 4-9 teaching and learning possible. This will be influenced by the best practices in math education. 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

- Textbook: Calculus Connections-Mathematics for Middle School Teachers by Harcharras and Mitrea
- Blackboard account with enrollment in MATH 274
- Handouts provided by the instructors
- Washington State Academic Learning Requirements for Math <http://www.k12.wa.us/CurriculumInstruct/default.aspx>
- Graphing Calculator (TI-83+ is best)

Learner Outcomes and Assessment

By the end of the course, students will be able to:

Outcomes	Assessment	Standards
Create and solving problems using the conceptual and procedural elements of limits and continuity.	Written projects connected to teaching middle level students, quizzes, classroom projects, and exams.	WA-MLM 11 WA-MLS 13 -20
Create and solving problems using the conceptual and procedural elements of differentiation.	Written projects connected to teaching middle level students, quizzes, classroom projects, and exams.	WA-MLM 11 WA-MLS 13 -20
Create and solving problems using the conceptual and procedural elements of integration.	Written projects connected to teaching middle level students, quizzes, classroom projects, and exams.	WA-MLM 11 WA-MLS 13 -20
Use technology tools to explore and represent fundamental concepts of calculus.	Written projects connected to teaching middle level students, classroom projects, and exams.	WA-MLM 11 WA-MLS 13 -20
Create and solving problems with historic and cultural relevance.	Written projects connected to teaching middle level students.	WA-MLM 11 WA-MLS 13 -20

Assessment and Evaluation Guidelines

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
Written problem solving projects connected to teaching middle level students (5 projects at 40 points each)	200
Unit Exams: Most likely take-home exams (4 exams at 50 points each)	200
Quizzes (12 multiple choice quizzes worth 20 points each)	240
Comprehensive final multiple choice final exam (100 points)	100
Total Points	740

Grading Scale

93-100% = A, 90-93% = A-, 87-90% = B+, 83-87% = B, 80-83% = B-, 77-80% = C+, 73-77% = C, 70-73% = C-, 67-70% = D+, 63-67% = D, 60-63% = D-, 0-60% = F Please see the CWU Catalog for the eligibility requirements for an incomplete (I).

Performance Expectations

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 the responsibility for your own achievement of these performance objectives. Use the activities, assignments, assessments and people such as the instructor to insure that you understand the mathematical teaching concepts and can demonstrated this understanding in the form of the performance objectives.

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 5	Intro, Chapter 1	Pages 22-23
Jan 12	Chapter 1	Project 1 and Pages 23-25, 44-45, and 56-58
Jan 19	Chapter 2	Exam 1 and Pages 71, 76-77, and 100-101, 107, and 111-113
Jan 26	Chapter 2	Project 2 and Pages 100-101, 107, and 111-113
Feb 2	Chapter 3	Exam 2 and Pages 117-119 and 127-131
Feb 9	Chapter 3	Project 3 and Pages 133-134 and 141,
Feb 16	Chapter 3 & 4	Exam 3 and Pages 147-148 149-152, and 163-166
Feb 23	Chapter 5	Project 4 and Pages 196-197 and 202-203
March 2	Chapter 5	Project 5 and Pages 208-209
Mar 9	Chapter 5 & 6	Exam 4 and Pages 215-216 and 231-235

Mar 17

March 17 at noon is the final

Final exam