Mathematics in the Secondary School
Math 416
Fall 2015 -Meeting T & R 10:30 -11:45 in MacLean 269

Professor: Tim Harms
Office: MacLean 375F
Office Phone: 218-477-4016
Office hrs: M 12:00-12:50, T 8:30-10:30 & 1:00-2:50, W 8:30-11:00, R 8:30-10:30, F 12:00-12:50
Additional meetings available by appointment
E-mail: harms@mnstate.edu
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Class assignments with due dates are posted along with a link to your individual progress report are located on the course website.

Required Text:

Required Supplies
Pencil, three ring binder, jump drive, & graphing calculator (you may check-out a TI-83 or TI-84 from Professor Harms if you do not own one)

Course Description:
Objectives, methods, materials, and evaluation of teaching mathematics in grades 9-12.

Prerequisites: Secondary Math Education Major with Junior or Senior standing who has been admitted into Teacher Education.

Course Objectives:
1) Formulate a personal sense of what is mathematics and what it means to teach mathematics.
2) Plan lessons that involve thoughtful questioning while balancing styles of presentation.
3) Create assessments that will be used to evaluate students understanding.
4) Demonstrate appropriate uses of technology in teaching.
5) Practice equity of instruction through applicable modifications of lessons.
6) A minimum of 16 pages (4800 to 5000 words) per student of formal, polished writing in multiple assignments that span the semester, rather than one long paper handed in at the end of the term;
7) Include at least one assignment that requires drafting and revision;
8) Include informal writing-to-learn assignments or activities;

Class Expectations:
• Regular and active classroom participation
• Students will take on teaching responsibilities through class presentations, tutoring, and discussions.
• Please silence cell phones and avoid texting in class
• Students will act in an honest and trustworthy manner in class and on all assignments.
• 20 hours of tutoring in the Math Learning Center
Course Activities:
Cooperative learning, integration of technology, and assessment of mathematical knowledge will be used in the teaching of this course by the instructor as well as the students during their lesson presentations. Students will include current MN/ND Mathematics Standards in lesson and unit planning.

Evaluation:
- Book and supplementary assignments – 3 to 5 pts. each
- Lesson Plans – 10 pts. each
- Mini-lessons taught in class and in the MLC– 10 pts. each
- Reflections of select mini lessons – 5 pts
- Analyzing Student Work – 15 pts.
- Unit plan (outlining the objectives, assignments, creating at least 2 assessments, & the identification of modifications for a students with disabilities) – 50 pts.
- Quizzes – 10 pts. each
- Final Exam – 40 pts. letter of application and mock interview for a High School Math Teaching position

(Late work will lose 50% of its value each day it is late unless prior arrangements have been made)

Grading Scale:
100-98 A+; 97-93 A; 92-90 A-
89-88 B+; 87-83 B; 82-80 B-
79-78 C+; 77-73 C; 72-70 C-
69-68 D+; 67-63 D; 62-60 D-
59% - F

Special Accommodations
Minnesota State University Moorhead is committed to providing equitable access to learning opportunities for all students. The Disability Resource Center (DRC) is the campus office that collaborates with students who have disabilities to provide and/or arrange reasonable accommodations.

- If you have, or think you may have, a disability (e.g. mental health, attentional, learning, chronic health, sensory or physical) please contact the DRC at (218) 477-4318 (V) or (800)627.3529 (MRS/TTY) to schedule an appointment for an intake.

- Additional information is available on the DRC website: http://www.mnstate.edu/disability/

- If you are registered with the DRC and have a current Accommodation Letter, please schedule an appointment to visit with me, during my office hours, to discuss implementation of your accommodations.
Reference Texts:
Guidelines for the Tutor of Mathematics, Laughlin, C., and Kepner, H., NCTM, 2001 (on reserve in the Library for 2 hr check out and overnight under MAT-566)
North Dakota’s Math Standards http://www.dpi.state.nd.us/standard/content_standards_math.shtm

To meet the Writing-Intensive course requirements, the course must:
assign a minimum of 16 pages (4800 to 5000 words) per student of formal, polished writing in multiple assignments that span the semester, rather than one long paper handed in at the end of the term;

- include at least one assignment that requires drafting and revision;
- include informal writing-to-learn assignments or activities;
- indicate how the quality of student writing will affect the course grade.

In a Writing-Intensive course, formal writing assignments and evaluation criteria must be given to students in writing far enough ahead of time to facilitate thoughtful writing and students’ use of conferences with the instructor, a writing center tutor, or a peer response group before the paper is due if they choose.
The professor will offer substantive response to the students’ writing, using the following criteria:

Focus — The paper addresses the assignment/answers the question? There is a thesis, main idea, or hypothesis that holds the paper together.

Organization — The paper is cohesively organized, making effective use of paragraphs and transitions, or other appropriate genre conventions.

Development — The paper provides sufficient evidence to support the over-all thesis, or answer the question. Topic sentences for each paragraph are adequately supported.

Clarity — Sentences are clear and effectively punctuated (appropriate diction, no run-ons, fragments, misspellings, or grammar errors).

Voice — The tone is professional and informative (not stuffy, preachy, whiny, or filled with slang).

High School Math Unit Plan & Assessment spanning 3-4 weeks of instruction
{Math Standards 3G4b; 3I3; StEP 1E, 1J, 7D, 8E, 8G} (50 pts)
Part I-Nov. 3rd
- Assessment(s)— In the form of at least two quizzes and one test which:
  - Incorporates the daily objectives along with the MN standards (10 pts)
  - Questions clearly and correctly phrased, properly formatted, with a reasonable length of time allotted, point values assigned, and adequate space provided for work (8 pts)
  - Solution keys that include worked out assessments (10 pts)
Part II of Unit Plan - Nov. 17th

- An overview of the unit with timeline for teaching that includes a brief description of instructional strategies to be used. (4 pts)
- Daily student performance objectives linked to state math standards & benchmarks. (4 pts)
- Identify the textbook and at least 3 supplements you would include such as problems from other books, worksheets, or websites that make connections between the mathematics being studied and other disciplines. (3 pts)
- A description of accommodations for 3 groups of students: those with special needs on an IEP for attention deficit disorder, ELL students, and high-achieving students. (3 pts)
- List Daily homework each assignment is to be worked out and included. (8 pts)

While working 20 hrs with students in the Math Learning Center pre-service teachers will be prepared to assist students by working the labs prior to the lesson, actively question students to determine their level of understanding, and reflect how to help students develop mathematical understanding with more assurance. {Math Standards 3C1-C5 P.A; StEP 8F, 8k}

You are to keep a log of your experience tutoring this semester in the Math Learning Center that includes: Due Dec. 3rd {StEP 8C, 9J, 10G} (20 pts)

- Date of tutoring, list classes tutored, and list topics covered in class.
- Rate your preparation for the lab. This will be evaluated by math faculty to confirm you thoroughly worked out the problems in advance and came prepared when scheduled to tutor.
- What did you consider the most helpful comments the lab instructor made to help students think about what they were doing? If working no instructor comments fit this situation, or if you are serving as a drop-in tutor describe at least two things you did to assist students in each session.
- Describe what you noticed about how students were thinking about at least two problems.

Lesson presentations of high school level mathematics topics {Math Standards 3G4c & a; 3I5; StEP 1C, 9.8.E}

- Turn in a copy of your lesson plan before you teach
- Professional Dress and Behavior
- Motivational activity that makes connections between mathematics and daily living
- Questions throughout the lesson from a variety of cognitive domains
- Content presented clearly & correctly (speech in loud and articulate, writing is legible and large, statements are mathematically correct)
- Lesson Reflection completed within 4 days of the lesson presented
Teaching Handbook - 5 pts/assignment to be typed and address each item

- An easy to read first day of School Handout with the following: Due Sept. 3rd {StEP 5C}
  - Goals for the class (Identify a specific high school math class this is designed for)
  - Guidelines for student behavior and consequences of misbehavior
  - Grading philosophy (include extra credit policy)
  - Make-up policy
  - Calculator and computer policy (and other required materials)

- Tutoring Goals-Read Guidelines for the Tutor of Mathematics (On Reserve in the Library & 2 copies are circulated) Due Sept. 10th {StEP 6H and edTPA}
  - What are the most important communication skills for tutors that are mentioned in this book?
  - What are the most relevant comments to you regarding being prepared to tutor?
  - List at least two questions you will regularly ask students as you tutor.

- Read Every Minute Counts - Due Sept. 24th {StEP 6H}
  - What are at least three questioning techniques you read that you want to include in your teaching?
  - What are at least three questioning techniques you read that you want to avoid in your teaching?
  - Describe a “routine” you plan to use with your math classes

- Summarize an article from Mathematics Teacher Due Oct. 1st {WI}
  - Summarize the article in 2-3 paragraphs.
  - Describe how you could use this information in your teaching
  - Include a citation with: the author(s), title, volume, number, month, yr, and page numbers along with a copy of the article
  - A 2-3 min. summary to your classmates in Math 416 is to be given within a week of submitting your write-up

- Write 6 anticipatory problems Due Oct. 8th {Math Standards 3I1 K,P,A; 3I8 K; StEP 7F}
  - 2 problems to engage students in geometry lessons & identify MN Math Benchmark each addresses
  - 2 problems to engage students in Algebra II lessons & identify MN Math Benchmark each addresses
  - 2 problems to engage students that are in Pre-Calculus

- Final Handbook – Due Oct. 22nd {Math Standards 3I8 K,P,A}
  - Revised drafts of the assignments listed above following recommendations made. The final draft is to include correct spelling, grammar, and punctuation.