MA 310 001, Problem Solving for Teachers
University of Kentucky, Spring 2014

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Office Phone: 257-6810
Class Time/Location: CB 335, MWF 1:00-1:50PM
Office Location/Hours: POT 831, by appointment

Course Texts:


1 Course Description, Student Learning Outcomes, Class Structure

This is a course on problem solving for future high school teachers of mathematics. Whether or not you intend to be a high school mathematics teacher, developing your ability and knowledge in mathematical problem solving in the context of K-12 education is beneficial in our various roles as citizens, parents, uncles, aunts, volunteers, community members, etc. There are four primary learning outcomes for students in this class:

- to improve your personal practice of mathematical problem solving,
- to consciously develop and use a variety of strategies, tactics, and tools in your problem solving,
- to become skilled at critiquing the problem solving practices of others, and
- to deepen your understanding of the role played by mathematical problem solving in K-12 education.

Our activities in this course will directly serve these four student learning outcomes. Class time will generally not be spent in a formal lecture style. Instead, we will spend time in class discussing reading assignments, working on problems in groups, presenting problem progress and solutions at the board, critiquing each others reasoning and practices, etc. Outside of class, you should expect to spend:

- 3 hours per week completing reading assignments
- 3-6 hours per week working on problems and essays

1 I reserve the right to change or amend this syllabus at any time for any reason.
2 Online Discussion Board

MA 310 Online Discussion Board:

https://piazza.com/uky/spring2014/ma310/home

Piazza is an online discussion board where we can collectively ask and answer questions. While you are expected to participate on the discussion board, the mathematical content on the discussion board is not part of your course grade. The purpose of the discussion board is to allow us a place where we can make mistakes, introduce errors, head down blind alleys, etc, as a community of learners in a common search for understanding. When you are asking questions, answering questions, giving partial answers to questions, suggesting ideas, etc, please keep vividly in your mind the following quote.

Learning is least useful when it is private and hidden; it is most powerful when it becomes public and communal. Learning flourishes when we take what we think we know and offer it as community property among fellow learners so that it can be tested, examined, challenged, and improved before we internalize it.

*Taking Learning Seriously*

LEE SHULMAN

3 Attendance and Participation

- You must be present and engaged in class each day.
- You are also expected to participate on the course discussion board.
- Your participation grade will be largely subjective. If you have any concerns, come talk with me about them.
- You are allowed 3 unexcused absences. Beyond that, you will lose 2% of your overall course grade for each unexcused absence.
- Students must notify the instructor of their absence prior to the absence or within one week after the absence.
- Students must submit any written documentation supporting their excused absence within one week after the absence.
- Absences for major religious holidays require one week advance written notification.

4 Course Portfolio

You will create a portfolio containing all of your work for the course. Your portfolio will be collected and assigned a grade three times during the semester. This portfolio will have the following four sections.
4.1 Journal on Strategies, Tactics, and Tools
You should keep a list of strategies, tactics, and tools that are discussed in the readings. This does not need to include a reflective component; it is meant to be an encyclopedia of the bold-face and italicized terms in our main textbook, including definitions/descriptions of their meaning. This document must be typed.

- The journal portion of the portfolio will be worth 5% of the portfolio grade, and will be assessed based on completeness.

4.2 Quizzes
Quizzes will take place roughly once per week in this course, and will be announced in advance. Each quiz will consist of one exercise or problem and will last for 25 minutes. After being graded and returned, all quizzes should be included in the course portfolio.

- The total quiz score will be worth 35% of your portfolio grade.

4.3 Problems
The problems section of your portfolio will have two subsections, one for solutions to in-class problems and one for solutions to homework problems. Homework problems will be graded after initial submission — select homework problems will be eligible for revision and re-grading as a part of the portfolio. In-class problems will be graded based on the inclusion of clear evidence demonstrating your work on them.

- Each problem solution should be contained on a separate page(s) in your portfolio.

- The total problem score will be worth 40% of your portfolio grade.

4.4 Reflective Essays
You will write reflective essays on a regular basis. Some of these will be graded based on completion, while others will be graded using the course grading rubric for writing.

- The reflective essay score will be worth 20% of your portfolio grade.

5 Comments regarding student work

- No late work will be accepted.

- You should work with other students and share your ideas as part of our course community.

- However, you should not let your collaboration devolve into letting someone else do all the “hard parts” and then copying their answers.

- Three Rules:
  - Don’t talk to anyone about the problems until you have made a genuine effort to solve them yourself.
  - You must write up the solutions on your own.
  - You may not search the internet for solutions to problems. We will use our creativity, course texts, and the online discussion board as our springboard to investigation.
6 Portfolio Due Date, Final Discussion Time, Course Grading

- Your final portfolio is due in class on *Wednesday, April 30*.
- We will hold our final class discussion during the final exam time: 1-2PM, Wednesday May 7
  - Attendance at the final class discussion is mandatory.
  - Your portfolios will be returned during the final class discussion.
- Your total grade will be determined by your attendance and participation, assignments, and quizzes. The grading scale will be no stricter than the usual A>89.9, B>79.9, C>69.9, D>59.9, E otherwise, weighted as follows:
  - Attendance and Participation: 10%
  - Final Portfolio Grade: 90%

7 Course Expectations and Classroom/Learning Accommodations

All students are expected to follow the academic integrity standards as explained in the University Senate Rules, particularly Chapter 6, found at:

http://www.uky.edu/Faculty/Senate/rules_regulations/index.htm

Turn off all cell phones, pagers, etc. prior to entering the classroom. **You are not to use your cell phones, pagers, or other electronic devices during class.** An attitude of respect for and civility towards other students in the class and the instructor is expected at all times.

Any student with a disability who is taking this course and needs classroom or exam accommodations should contact the Disability Resource Center, 257-2754, room 2 Alumni Gym, jkarnes@uky.edu.