MA 351 Models and Problem Solving for the Elementary School Teacher
Winter Semester 2008 M-T-W-R 4:00-4:50 WS 3616

Prerequisites: Grade of C or higher in MA 250

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Office Hours: MWR 1:30 – 3:00; T 2:00 – 3:00; other times by appointment

Course Overview: MA 351 Models and Problem Solving for the Elementary School Teacher focuses on problem solving, with topics drawn from historical mathematics, number theory, algebra, geometry, trigonometry and recreational mathematics.

Required Materials:

- **Text:** K. Johnson, T. Herr, and J. Kysh. *Crossing the River with Dogs: Problem Solving for College Students*. Key College Publishing, 2004.
- **Calculator:** A graphing calculator is required. Have it with you in class at all times.
- **Computer technology:** Be sure you have Excel and Geometer's Sketchpad installed on your laptop. (Take your computer to the Help Desk if you do not have these.)
- **Mathematics "tool kit":** The following items will be used frequently. Gather them into a kit that <u>you bring to class with you every day</u>. You will also need these things when you are studying, working on problems, and taking tests. Include the following items in your tool kit:
    - ruler marked in both inches and centimeters
    - scissors (for cutting paper)
    - colored pencils
    - eraser
    - graph paper (Graph paper is readily available wherever you get school supplies.)
    - plain, unlined paper will be needed for some activities

Course Goals:

- To enrich your mathematics background by studying a number of topics that may be unfamiliar to you.
- To develop your problem-solving ability and increase your repertoire of problem-solving techniques.
- To analyze the problem-solving process, investigate sources of problems, and identify ways to promote the development of problem-solving skills.
- To write coherent explanations of problem solutions and to verbalize solution processes, including unsuccessful as well as successful strategies, to others in the class.
- To reflect on problem solutions and strategies and examine their connections to other topics of mathematics and to a variety of applications.
- To apply both inductive and deductive reasoning to the proof of mathematical results.
- To increase your enjoyment of and enthusiasm for mathematics.

Course Requirements and Expectations:

- Attend every class and <u>participate actively</u> in class discussions and activities. Roll will be taken daily, and absences will negatively impact your grade.
- Complete all assignments on time. Homework assignments will be recorded. Selected assignments or parts of assignments will be graded. Missed or late assignments will not be credited.
- Read and study all of the assigned material. You are responsible for material covered in assigned readings, even if it is not directly addressed in class. If you do not understand something in the reading, it

is your responsibility to ask questions and get clarification. Questions are always welcome in class as well as in the office.

- Working with other students and discussing the ideas with them can be very beneficial. You are required to write your own solutions in your own words when completing assignments, but you are also encouraged to study and discuss ideas with others. Much can be learned from explaining ideas to a peer.
- When writing up homework problems, it is essential that you give complete explanations and explain your thinking (how you got the answer). A "naked answer" (like "12" or "x") will not receive credit. The course text includes valuable suggestions for how to present solutions.

Assessment: Assessment of your progress will take place through graded assignments, quizzes, tests, examinations, and class participation.

Quizzes may be given at any time and will usually be unannounced. Missed quizzes cannot be made up. The lowest quiz score will be eliminated from the final grade; all other quizzes will be counted.

Mid-term exam will be given on **Thursday, February 28**. This is the last class before the winter break. There will be **NO DEVIATIONS** to this schedule. The mid-term exam will be over all of the material covered to date. (Mid-term exam: 100 points.)

Final exam will be given according to the published NMU exam schedule (Wednesday, April 30, 4:00–5:50). It will be a comprehensive exam covering the entire course. (Final exam: 200 points.)

One or two other tests will be given. Dates and further details will be given in class approximately one week before the respective tests. (These tests: 100 points each.)

Homework assignments will be recorded. Selected assignments or parts of assignments will be graded. Missed or late assignments will not be credited. The lowest homework grade will be eliminated from the final grade; all others will be counted.

Class attendance and active class participation will be weighed into the final grade. An "active participant" attends class every day, arrives on time, completes all assignments by their deadlines, asks and answers questions in class, and engages in group discussions and problem-solving activities. (A maximum of 100 points can be earned for perfect attendance and active class participation. Points will be deducted for classes missed, for late arrivals, and for lack of participation.)

Grading: Points will be assigned for quizzes, tests and examinations, homework, and class participation. Your grade will be determined by the percentage of the total possible points that you earn, as follows:

A = 93-100%; A– = 90-92%; B+ = 88-89%; B = 83-87%; B– = 80-82%; C+ = 78-79%; C = 73-77%; C– = 70-72%; D = 60-69%; F = below 60%

If you have a need for disability-related accommodations or services, please inform the Coordinator of Disability Services in the Disability Services Office by: coming into the office at 2001 C. B. Hedgcock; calling 227-1700; or e-mailing disserv@nmu.edu. Reasonable and effective accommodations and services will be provided to students if requests are made in a timely manner, with appropriate documentation, in accordance with federal, state, and University guidelines.