Syllabus
MA 354 Methods and Materials in the Teaching of Middle School Mathematics

Instructor: Jane A. Jamsen (jjamsen@nmu.edu)
Classroom and Meeting Time: Tues., 9 - 10:40 A.M., WS 3806
Office: NSF 1113, 227-1603
Hours: As posted and by appointment

Goal/Purpose of the Course:

MA 354 is designed for secondary and elementary mathematics education majors and will address the teaching of mathematics at the middle school level, grades 6 - 8. Various methodologies will be explored and the mathematics curriculum will be examined with attention given to the special needs and characteristics of the middle school student. In addition, there will be a great emphasis on the interaction between content and pedagogy and on problem solving and activity-based learning.

Objectives:

1. Examine the new middle school curriculum as expressed in the *NCTM Principles and Standards for School Mathematics* and the Michigan Curriculum Frameworks.
2. Develop methods for teaching problem solving strategies and model investigative techniques.
3. Explore verbal, concrete, pictorial, graphical and algebraic models as communicating mathematics.
4. Experience activities and problems that model the development of number sense.
5. Examine real numbers and various operations, with emphasis on mental computation and estimation.
6. Develop meaningful ways to use calculators and computers.
7. Explore the integration of geometry into the middle school curriculum.
8. Explore concrete lab activities using the tools of measurement and measurement systems.
9. Examine the role of various manipulatives in the teaching of middle school mathematics.
10. Develop activities in quantitative literacy
11. Explore the use of patterns and functions in middle school mathematics.
12. Examine algebra readiness activities and the role of algebra in middle school.
13. Through the field experience, examine the special needs of middle school students including motivation, diagnosis, remediation and acceleration.
14. Develop effective classroom management and planning techniques and explore a model for structured groupwork.

Requirements:

1. <u>Attendance is absolutely necessary.</u> If you must miss class due to illness or other emergency, you are responsible for calling or emailing me - and keeping up with the assignments. (I expect the assignment that is due that week to be into my office by Friday.) I will gladly e-mail the next week's assignment to you. One or more unexcused absences may result in a grade of "F" for the course.

2. You will sign up for 10 middle school classroom visits, each time observing a complete math session. The teacher may have you assist individual students, work with groups of students and teach a lesson. (I encourage you to get actively involved in the classroom!) You are to record the dates and times of your visits on the form provided and have the teacher initial the log each time. So that you have additional experience prior to student teaching, I encourage you to work with the teacher to allow you to teach one lesson (10 pts.). If possible, I will

come to observe you at that time. I require a lesson plan (for both the teacher and me) that includes all the components cited in parts a) - d) of no. 4 below. I do expect you to write a reflection on the lesson you conduct in the classroom. This will be your journal entry for that day.

3. You must keep a journal of your middle school classroom experiences. I will provide you with a general guideline for the first visit, but things to include are typically the methodology of the teacher (in terms of content taught and how discipline is managed) and experiences with kids that you would like to document. I will collect these journals around mid-term and again at the end of the semester to peruse your entries. The journal is worth 30 points.

4. You will be required to do a project for this course (30 pts.). The requirements are as follows:

   You will be organized into groups of 4 people and your project will consist of developing learning centers appropriate for middle school students. It will be your responsibility to select a "theme" or topic and then make sure that the four learning centers developed by your group all reflect that theme (or topic). You will submit a main lesson plan, in the format as described below, and include an activity page for each center. You should design the centers so that each activity can be done in approximately 15 minutes. For our class time one or two weeks in April, our class will be your "students" and we will rotate through the centers just as the middle school students would. I will grade the centers according to a rubric which I will share with you later on in the semester.

   The lesson plan format should contain:

   a. Objective of the entire lesson with short objectives for each center;

   b. Prerequisite skills needed;

   c. Outline of each activity and activity worksheets, as appropriate;

   d. Description of how each activity will be evaluated;

   e. Reflection (which you will write after the centers have been implemented)

5. You will be required to do outside readings, middle school textbook analyses, an analysis *of* several *of* Marilyn Bums' videos and spend time exploring software appropriate for these grade levels. We may also have some in-class assignments based on the use *of* various manipulatives. Written assignments are typically worth 5-15 points each and will be collected at the next class meeting. Assignments will be accepted one day late without penalty. After that time, points will be taken *off* systematically.

Texts: NCTM Addenda Series for grades 5-8: *Developing Number Sense*
NCTM: *Navigating through Algebra* 6-8, *and Navigating through Geometry* 6-8

In addition to the NCTM materials, other activities and problems will be explored so that our goals are achieved.

Grading: This course is graded on a A-F basis. Your grade will be calculated by taking the ratio *of* points you have earned to the total possible (in percent form). My grading scale is:

A's - 90 -100%
B's - 80 - 89
C's - 70 - 79
D's - 60-69
F - below 60

Note 1: Take advantage *of* my office time to seek help and/or resources as needed.

Note 2: If you have a need for disability-related accommodations or services, please inform the Coordinator *of* Disability Services in the Disability Services Office at 1104 University Center (227-1737). 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.

'i