COURSE: Mathematics for Elementary Teachers (Math 41) - Section 2592, Fall 2007

HOURS: Class meets 12:45pm – 02:05pm on Mon & Wed in MC 74

PREREQ: Completion of Math 20(Intermediate Algebra) with a grade of C or better

OFFICE: MC 26

HOURS: In the office: Mon, 11:30am – 12:30pm; Wed 02:15pm – 03:15pm; Thu, 02:00pm – 03:00pm
In Math Lab: Tues, 01:00pm – 02:00pm

PHONE: Voicemail (310) 434-4722

MAIL: Students may leave written material/messages in the campus mailroom in the Liberal Arts Bldg
email: manion_fran@smc.edu (I try to check my email each evening.)

WEB Sites: http://homepage.smc.edu/manion_fran
The Website contains syllabus, tentative lecture schedule, homework assignments, unit objectives, review sheets, announcements and links to course-related material. We will also use eCompanion to facilitate communication and posting of grades.
http://matti.usu.edu/nlvm/nav/vlibrary.html
National Library of Virtual Manipulatives for Interactive Mathematics, a website funded by an NSF (National Science Foundation) grant, provides a library of Web-based manipulatives to assist students in visualizing mathematical relationships and applications. No password is required.
http://www.pbs.org/teachersource/math.htm
PBS Teacher Source is an excellent resource for lesson plans and activities for math education.


CONTENT
This course is designed for pre-service elementary school teachers. The course will examine four content areas:
• Numeration (historical development and structure of numeration systems);
• Number Theory (divisibility, primes and composites, greatest common divisor, least common multiple);
• Properties of Numbers (whole numbers, integers, rational numbers and models for teaching binary operations);
• Problem Solving (strategies, models to solve problems, inductive and deductive reasoning).

PREREQUISITE SKILLS
Your instructor will expect that prior to enrolling in this course you are able to:
A. Solve equations (including linear, quadratic, rational, radical and literal equations).
B. Solve linear and quadratic inequalities
C. Use interval notation, number line notation, set-builder, and inequality notation to express the solution to a linear, quadratic, or rational inequality.
D. Solve application problems using equations.
E. Find the domain and range of functions including, polynomials, rational, and radical functions.
F. Perform operations on functions.
G. Graph simple (including; constant, linear, quadratic, cubic, absolute value, radical) functions by vertical and horizontal translation.
H. Graph linear equations and inequalities.
I. Simplify exponential expressions.
J. Recognize and use common mathematical language to describe mathematical processes in either written or verbal form.
COURSE OBJECTIVES
Upon completion of this course, students will be able to:

1. Perform binary operations in a variety of numeration systems.
2. Demonstrate models for teaching binary operations (addition, subtraction, multiplication and division) with whole numbers, integers, and rational numbers;
3. Recognize the properties of the real number system;
4. Use the rules of divisibility and prime factorization of composite numbers to find the least common multiple and greatest common factor;
5. Use defined problem-solving strategies to solve application problems.

REGULAR ATTENDANCE at class is required. Attendance will be taken. The instructor may drop any student who misses four class meetings. We will be doing some group activities in this class. As future teachers, your participation is important!

HOMEWORK will be assigned at each class meeting and should be done as soon as possible after class. It is a good idea to review class notes before attempting the homework assignment. Practice with mathematical concepts is essential to your success in this class.

Homework is due each Wednesday. See the sheet “Communicating Mathematics Effectively” at the end of the syllabus for guidelines on preparing your homework assignments. Selected homework problems will be graded. Each weekly homework assignment is worth a total of 5 points: 0 – 2 points for the number of problems attempted and 0 – 3 points for graded problems. Graded homework will be evaluated on mathematical content, presentation, clarity and completeness of work and will account for 5% of your final grade.

Homework questions will be discussed during the first 10 minutes of the class period. Students will be asked to demonstrate solutions to selected homework problems and will earn “participation points” for these presentations. Each student is expected to present at least 3 problems at the board during the course of the semester.

Homework also includes pre-reading the sections scheduled for discussion at the next class. Frequent QUIZZES (based on homework problems and lectures) will monitor students’ understanding of concepts, notation and terminology. Participation points and quizzes will account for 10% of the student’s final grade.

There will be four UNIT TESTS during the semester. Your best three test scores will account for 60% of your final grade in the course. Topics included on each test are:

<table>
<thead>
<tr>
<th>Test</th>
<th>Chapters</th>
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<tbody>
<tr>
<td>Unit 1 Test:</td>
<td>1 &amp; 2</td>
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<td>Unit 2 Test:</td>
<td>3 &amp; 4</td>
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<td>Unit 3 Test:</td>
<td>5, 6 &amp; 7</td>
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<tr>
<td>Unit 4 Test:</td>
<td>8, 9, 10 &amp; 11</td>
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Your lowest unit test score will be dropped. No make-up tests will be given.

A COMPREHENSIVE FINAL EXAM will be given according to the college final exam schedule and will account for 25% in the computation of the final grade. You must receive a passing grade (D or better) on the final in order to pass the class.
LETTER GRADES on tests, quizzes, and the final exam will be assigned according to the following scale:

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<tr>
<th>Grade</th>
<th>Percentage</th>
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<tr>
<td>A</td>
<td>90% - 100%</td>
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<tr>
<td>B</td>
<td>80% - 89%</td>
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<tr>
<td>C</td>
<td>70% - 79%</td>
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<tr>
<td>D</td>
<td>60% - 69%</td>
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<tr>
<td>F</td>
<td>below 60%</td>
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Your final grade will be calculated as a weighted average using the following formula:

\[
\text{Final Grade} = 0.05(\text{Homework}) + 0.10(\text{Participation & Quizzes}) + 0.60(\text{Test Average}) + 0.25(\text{Final Exam})
\]

Maintaining the appropriate CLASSROOM CLIMATE is the responsibility of each student.

✓ As a matter of courtesy, you should arrive on time for class.
✓ Pagers and cellular phones should be turned off or muted during class time to avoid creating a distraction.
✓ Food and beverages should be consumed outside the classroom.
✓ You are expected to be courteous to and respectful of your colleagues as well as the instructor.
✓ Talking during the lecture or announcements is a distraction to other students and the instructor and should be avoided.

Santa Monica College has a STUDENT CONDUCT CODE and may discipline students in accordance with its provisions. The College also has the authority to remove students from a class or program if they are disruptive of the instructional process, do not respect the civil rights of other students, cannot benefit from instruction, or present health and/or safety hazards in a class. Disciplinary sanctions include, but are not limited to, verbal or written reprimand, disciplinary probation, removal from class, ineligibility to participate in extracurricular activities, suspension, and expulsion.

Santa Monica College defines ACADEMIC DISHONESTY as the act of or assistance in deceiving, including fraud or deception, in any academic exercise. This includes, but is not limited to, the following actions not authorized by the instructor:

✓ Using testing aids such as calculators, tape recorders, or notes on any examination.
✓ Allowing another individual to assume one’s identity for the purpose of enhancing one’s grade in any of the following: testing, field trips, or attendance.
✓ Falsifying or attempting to falsify attendance records and/or grade rosters.
✓ Representing the words, ideas or work of another as one’s own in any academic exercise (plagiarism), including the use of commercial term paper companies.
✓ Changing answers on a previously scored test, assignment, or experiment with the intent to defraud.
✓ Copying or allowing another student to copy from one’s paper or answer sheet during an examination.
✓ Inventing information for the purpose of completing a laboratory exercise or case study with the intent to defraud.
✓ Giving and/or taking information during an examination by any means including sign language, hand signals, secret codes, or electronic transmission.

When taking a quiz or exam, you should keep your eyes on your own paper. Communicating (talk or body language) with another student during the exam without instructor permission is unacceptable. You are expected to do your own work on all quizzes and examinations. Students are encouraged to work together on the homework and review exercises. A first offense of academic dishonesty will result in a zero grade on that quiz or exam. A zero grade assigned as a result of academic dishonesty will NOT be dropped as the lowest score. In addition, a report will be filed with the Campus Disciplinarian.

For more detailed information, please refer to the College Conduct Code and Academic Conduct Code found posted in the classroom and in the SMC Student Handbook/Guide.
# Tentative Lecture Schedule

Homework should be done as soon as possible after class. It is a good idea to review class notes before attempting the homework.

<table>
<thead>
<tr>
<th>Date</th>
<th>Text Section</th>
<th>Date</th>
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</table>
| M, 08-27 | 1.1 What is a Quantity?  
1.2 Quantitative Analysis                                         | M, 10-22 | 6.1 Understanding the Meanings of \( \frac{a}{b} \)  
6.2 Equivalent (Equal)Fractions |
| W, 08-29 | 1.2 Quantitative Analysis  
1.3 Measuring Quantities                                               | W, 10-24 | 6.3 Relating Fractions and Decimals  
6.4 Estimating Fractional Values |
| M, 09-03 | Labor Day Holiday                                                          | M, 10-29 | 7.1 Adding and Subtracting Fractions  
7.2 Multiplying by a Fraction |
| W, 09-05 | Arithmetic Quiz  
2.1 Expressing Values of Quantities                                    | W, 10-31 | 7.3 Dividing by a Fraction  
7.4 Teaching Calculation with Fractions |
| S, 09-09 | **10:00pm – Last day to withdraw by phone or online and receive an enrollment refund** | M, 11-05 | 8.1 Quantitative Analysis – Multiplication  
8.2 Fractions in Multiplicative |
| M, 09-10 | 2.2 Place Value  
2.3 Bases Other than Ten                                                  | W, 11-07 | Test #3 Chapters 5, 6 and 7 |
| W, 09-12 | 2.4 Operations in Different Bases                                          | M, 11-12 | Veteran’s Day Holiday |
| S, 09-16 | **10:00pm – Last day to withdraw by phone or online and avoid a “W” on your transcript** | W, 11-14 | 9.1 Ratio as Measure  
9.2 Using Proportions to Compare Ratios |
| M, 09-17 | 3.1 Additive Combinations and Comparisons  
Test #1 Review                                                            | S, 11-18 | **01:30pm Last day to receive a W with a grade check (must have grade C or better)** |
| W, 09-19 | Test #1, Chapters 1 – 2                                                   | M, 11-19 | 9.3 Percents in Comparisons and Changes |
| F, 09-21 | **12:00pm – Last day to apply for Credit/No Credit**                       | W, 11-21 | 9.4 Practicing Multiplicative Reasoning  
10.1 Adding and Subtracting Signed Numbers |
| M, 09/24 | 3.2 Ways of Thinking about Addition & Subtraction  
3.3 Children’s Ways of Adding and Subtracting                           | M, 11-26 | 10.2 Another Way to Think …Add and Subtr  
10.3 Multiplying and Dividing Signed Numbers |
| W, 09-26 | 3.4 Ways of Thinking about Multiplication                                | W, 11-28 | 11.1 Factors and Multiples, Primes, Composites  
11.2 Prime Factorization |
| M, 10-01 | 3.5 Ways of Thinking about Division  
3.6 Children Find products & Quotients                                   | M, 12-03 | 11.3 Divisibility Tests  
11.4 Greatest Common Factor, Least Common Multiple |
| W, 10-03 | 3.7 Issues for Learning: Developing Number Sense  
4.1 Operating on Whole Numbers and Decimals                             | W, 12-05 | Test #4 Chapters 8, 9, 10 and 11 |
| M, 10-08 | 5.1 Mental Computation                                                    | M, 12-10 | Review for Final Exam |
| W, 10-10 | Test #2, Chapters 3 – 4                                                   | W, 12-12 | 12:00pm – 03:00pm Final Exam |
| M, 10-15 | 5.2 Computational Estimation  
5.3 Referents for Large / Small Numbers                                  |       |                              |
| W, 10-17 | 5.4 Using Scientific Notation for Estimating                            |       |                              |
| S, 10-21 | **10:00pm Last day to withdraw & get W**                                |       |                              |
Homework Assignments

Assignments will be due on Wednesday of each week. Your instructor will provide an assignment number corresponding to the week the assignment is due. It is your responsibility to record the assignment number for each homework section and submit the assignment on the appropriate due date.

**NOTE: For problems with multiple parts (a,b,c,...) do only parts a,c,e,...

<table>
<thead>
<tr>
<th>Assignment #</th>
<th>Homework Assignments – See &quot;Learning Exercises&quot;</th>
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<tr>
<td></td>
<td>Survey; 1.2 Activity 1</td>
<td>6.1 #1-5,8-11,13,15-21</td>
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<tr>
<td>1.2 #1-3,5-7</td>
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<td>6.2 #1-6,10-12</td>
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<td>1.3 #1-9 odd</td>
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<td>6.3 #1-7,9,.14</td>
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<td>2.1 #1-7</td>
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<td>6.4,#2,5-9,11-24</td>
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<td>2.2 #1,2,4,5,6,8,9</td>
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<td>7.1 #1,3,4-12,15</td>
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<td>2.3 #1-15</td>
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<td>7.2 #1-8,11-15</td>
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<td>2.4 #1-5,7,8</td>
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<td>7.3 #1-7,10-14</td>
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<td>3.1 #1,3-8,10,11</td>
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<td>7.4,#1-7</td>
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<td>3.2 #1-10,12-15</td>
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<td>8.1 #1-3</td>
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<td>3.3 #2,3,5</td>
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<td>8.2 #1-4,6,8,11</td>
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<td>3.4 #1-10,12-15</td>
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<td>9.1 #1,3,5</td>
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<td>3.5 #1-6,8,9</td>
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<td>9.2 #1,2,4,6-8,10-16,19,20</td>
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<td>3.6 #1-5</td>
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<td>9.3 #2-8,11,13,15,20,21</td>
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<td>3.7 #1-9</td>
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<td>10.1 #1-10</td>
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<td>4.1 #1-5</td>
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<td>5.4 #1-5,8</td>
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<td>11.3 #1-7,9-14</td>
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<td>11.4 #5-11,13,16,20,21,23</td>
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Homework Due Dates

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<thead>
<tr>
<th>Assignment #</th>
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<tbody>
<tr>
<td>1</td>
<td>Wed, 08-29</td>
<td>9</td>
<td>Wed, 10-24</td>
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<td>Wed, 10-17</td>
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Communicating Mathematics Effectively

As prospective elementary school teachers, one of the important skills you need to develop is the ability to communicate effectively both verbally and in writing. We will work on these skills in Math 41. You will prepare and submit homework exercises and projects for review by your instructor and your peers. In order to communicate your ideas effectively, it’s important to pay attention to how you put your thoughts together. Homework is not an end in itself; it is a tool for learning!

This document aims to provide some guidelines for communicating your mathematical work effectively in writing. So that I may provide you with meaningful and worthwhile feedback, it is important that you put your homework in an easy to read, easy to navigate format. The way you present your work should demonstrate the ideas you are trying to communicate. With this in mind, the following are some guidelines for submitting homework in your mathematics courses.

Homework Guidelines

• Your handwriting should be legible. You may want to print.
• Homework with multiple pages should be stapled in the upper left-hand corner.
• In the upper right-hand corner you should write (in this order)
  o Your Name
  o Your Class and Section Number
  o The Homework Set Number
  o The Due Date of the Homework
• Problems should be clearly labeled and numbered on the left side of the page. There should also be a visible separation between problems.
• Each solution should begin with the original problem statement.
• You should leave the top left margin and the entire left margin blank so that I may use this space for scoring and comments.
• Write the problems in the order they are assigned.
• When you begin work on problems a new section, start the new section on a new page.
• It is good practice to first work out the solutions to homework problems on scratch paper and to then neatly write up your solutions. This will help you to turn in a clean finished product.

Easy to Read Homework Format