Mathematics For Elementary Teachers I (MATH 112)
Autumn Quarter, 2009

Time/Place: MF 11:00-11:50 a.m. KRH 326
W 2:00-4:50 p.m. CTC 129

Instructor: Jonathan Duncan (jonathan.duncan@wallawalla.edu)
Office: Kretchmar Hall 330, phone: 527-2097
Office Hours: 10:00 MTWF, 11:00 W, 1:00 MWF, or by appointment

Text: Mathematics for Elementary School Teachers, 4th Edition,

Webpage: http://math.wallawalla.edu/courses/112/

This course covers topics in mathematics, including number theory, geometry, numeration, number systems, graphs, algebra, statistics, and measurements. We will cover chapters 1-4 and 7 in your text. The deadline for withdrawing from the course is Tuesday, 17 November and the final is on Monday, 14 December.

Topics

1. Foundations for Learning Mathematics:
   problem-solving, patterns, representation, reasoning and proof, communication, connections
2. Fundamental Concepts:
   sets, algebraic thinking, numeration
3. The Four Fundamental Operations of Arithmetic:
   understanding addition, subtraction, multiplication, and division
4. Number Theory:
   divisibility, prime and composite numbers, factoring, greatest common factor, least common multiple
5. Uncertainty: Data and Chance:
   collecting and analyzing data, representing and interpreting data, distributions, chance, counting and chance

The course is divided into two parts. A traditional lecture component focuses on teacher-directed learning and individual student homework. A laboratory component focuses on discovery learning and group work.

A. Lecture Component

Objectives
Upon completion of this course, students will have
1. developed an adult-level understanding of the elementary mathematics topics outlined above.
2. successfully engaged in mathematical thinking, reasoning, and problem solving.
3. become proficient in expressing clear and accurate solutions to mathematical problems in written form.

WeBWorK Assignments (A1, A2)
Mathematics is not a spectator sport. WeBWorK assignments will be given daily and will be due by midnight on the day of the next lecture. These assignments, together with the solution write-ups mentioned below, should be considered the minimum amount of homework required to pass the course. You should expect to spend approximately two hours on homework for every hour of class. At the end of the quarter, your lowest scoring WeBWorK assignment will be dropped.

Solution Write-Ups (A3)
In addition to your daily WeBWorK assignments, you will complete weekly assignments focusing on solution write-up. These assignments are due by 5:00 p.m. on the Monday following the week in which they are assigned. No solution write-up assignments will be dropped. Please contact your instructor well in advance if you believe illness or other unavoidable circumstances will necessitate turning in a late solution write-up.
Please use a pencil and 8.5 × 11 paper with clean edges for your solution write-ups. Staple multiple pages together and then fold the papers lengthwise, like a book. Write your name, the course number, and the week number on the front cover. Papers which do not meet these criteria may be discounted or returned.

**Exams (A1, A2)**
There will be an in-class midterm exam and a two-hour comprehensive final exam. The final exam may only be taken out of schedule after consultation with the Associate Academic Dean.

- **Midterm** Chapters 1, 2, and part of 3
  - **30 October**
- **Final** Comprehensive, emphasis on chapters 3, 4, and 7
  - **14 December, 2:00 p.m.**

**B. Laboratory Component**

**Objectives**
Upon completion of this course, students will have
1. learned to use concrete objects and pictures to represent abstract mathematical concepts.
2. developed the ability to construct their own mathematical knowledge.
3. become proficient at group problem solving in mathematics.

**Lab Participation (B.1, B.2, B.3)**
During the lab sessions devoted to group problem solving, each group member must participate. Participation is measured by the taking of attendance, your instructor’s evaluation of your attitude and time on task, and peer evaluations. It is impossible to substitute outside work for the experience gained during the lab. Because of this there will be no excused lab absences.

**Lab Reports (A.3, B.2, B.3)**
During and after each lab your will compile a “lab report” made up of three items:
1. records of your groups activities, discoveries, and completed handouts kept in a three-right binder;
2. a lab journal entry, completed in Moodle, in which you thoughtfully reflect on concepts seen in the lab and answer questions which extend those concepts; and
3. occasional group projects completed outside of the lab.

**Lab Exams (B.1, B.2, B.3)**
A lab midterm and final will be given at the end of the last lab meetings before the individual midterm and final. Lab exams will take roughly half of the lab period and will be completed in your groups. You may use your lab notebooks to assist you in these exams.

**Grades**
Your final letter grade is based on your quarter average as shown. Your quarter average is made up of six scores: your midterm and final exam scores, WeBWorK average, solution write-up average, lab exam scores, lab report average, and lab participation score. Weights for each of these are given below. Appropriate (to your instructor) modifications of the final letter grades may be made in individual cases for progress, unusual circumstances, etc.

<table>
<thead>
<tr>
<th>Score Weights</th>
<th>Letter Grades (lowest percent)</th>
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</thead>
<tbody>
<tr>
<td>Midterm and Final 50%</td>
<td>B+ 89% C+ 78% D+ 64%</td>
</tr>
<tr>
<td>WeBWorK 12%</td>
<td>A 93% B 82% C 68% D 57% F 0%</td>
</tr>
<tr>
<td>Write-Ups 8%</td>
<td>A- 91% B- 80% C- 66% D- 55%</td>
</tr>
<tr>
<td>Lab Exams 15%</td>
<td>Violation of academic integrity codes will result in disciplinary action.</td>
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<tr>
<td>Lab Reports 10%</td>
<td>Collaboration on homework is encouraged, but turn in your own work.</td>
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**Disabilities**
Students with a physical and/or learning disability who require accommodations should contact the instructor or Disability Support Services at 527-2366. This syllabus is available in alternative formats upon request.