Mathematics For Elementary Teachers I (MATH 112)
Autumn Quarter, 2013

Time/Place:  MF 11:00-11:50 a.m. KRH 345
            W  2:00-4:50 p.m.  CTC 129
Instructor:  Jonathan Duncan (jonathan.duncan@wallawalla.edu)
Office:      Kretchmar Hall 338, phone: 527-2097
Office Hours: 9:00 MTWF, 11:00 W, 1:00 MWF, or by appointment
Text:       Mathematical Reasoning for Elementary Teachers, 6th Edition
Webpage:    https://webwork.wallawalla.edu/moodle/

This course covers selected topics from: number theory, geometry, numeration, number systems, graphs, algebra, statistics, and measurements. We will cover chapters 1-7 in your text. The deadline for withdrawing from the course is Tuesday, 19 November and the final is on Monday, 16 December.

Topics

1. Thinking Critically:
   Pólya’s Problem-Solving Principles, various problem-solving strategies, reasoning mathematically
2. Sets and Whole Numbers:
   sets, set operations, counting, modeling whole number addition, subtraction, multiplication, and division
3. Numeration and Computation:
   ancient numeration systems, the Indo-Arabic system, other bases, addition algorithms, subtraction
   algorithms, multiplication algorithms, division algorithms, algorithms in other bases
4. Number Theory:
   divisibility, divisibility tests, greatest common divisors, least common multiples
5. Integers and Rational Numbers:
   representing integers, integer addition and subtraction, integer multiplication and division, fractions
   and rational numbers, fraction addition and subtraction, fraction multiplication and division
6. Decimals, Real Numbers, and Proportional Reasoning:
   decimals, real numbers, computations with decimals, proportional reasoning, percents

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. Daily WeBWorK assignments will be give, each due by 11:59 p.m. on the day of the next lecture. These assignments, with the write-ups mentioned below, should be considered the minimal amount of homework required to pass the course. They can be expected to take approximately two hours for every hour of lecture. You may request a one-class-day extension twice during the quarter. Further extensions may be given for appropriate and verifiable (to your instructor) reasons.

Solution Write-Ups (A3)
In addition to your daily WeBWorK, you will complete weekly assignments focusing on solution write-up. These assignments are due by 5:00 p.m. on the Tuesday following the week in which they are assigned. No
automatic extensions will be given for solution write-ups. Contact your instructor ahead of time if you believe your situation warrants an extension. Solution write-ups will be returned in a timely fashion, typically no more than two weeks after they are due.

Please complete solution writ-ups in pencil on 8.5 × 11 paper with clean edges. Staple multiple pages together and fold the assignment in half lengthwise. Write your name, the course number, and the week number on the front. Papers not meeting these criteria will be discounted 10% after the first write-up is handed back.

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

<table>
<thead>
<tr>
<th>Exam</th>
<th>Chapters</th>
<th>Date</th>
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<tbody>
<tr>
<td>Midterm</td>
<td>1, 2, and 3</td>
<td>1 November</td>
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<tr>
<td>Final</td>
<td>Comprehensive, emphasis on 4-7</td>
<td>16 December, 10:00 a.m.</td>
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### B. Laboratory Component

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

**Lab Participation (B1, B2, B3)**
During the lab sessions each student is expected to participate in group problem solving. It is impossible to substitute outside work for the experience thus gained, so there will be **no excused lab absences or tardies**. Participation is measured by
1. attendance, punctuality, and time on task.
2. attitude and contribution to the group as measured by peer and instructor evaluations.
3. completed activities kept in a three-ring lab binder.
4. group projects completed outside of the lab which extend or summarize activities completed in the lab.

**Lab Exam (B1, B2, B3)**
A final exam will be given during the last week of the quarter. During this exam you will work as a group to solve problems similar to those seen during the regular labs. You may reference your lab binders during this exam.

**Grades**
Your final letter grade is based on your quarter average as shown in the table below. Your quarter average is made up of six scores: your final exam score, midterm exam score, WeBWorK average, lab exam score, participation score, and your solution write-up average. 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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<tbody>
<tr>
<td>Final Exam 30%</td>
<td>B+ 89%  B 82%  C 68%  D 57%  F 0%</td>
</tr>
<tr>
<td>Midterm Exam 25%</td>
<td>A 93%  B 82%  C 68%  D 57%  F 0%</td>
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<tr>
<td>Lab Exam 15%</td>
<td>A- 91%  B- 80%  C- 66%  D- 55%</td>
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<tr>
<td>WeBWorK 15%</td>
<td>Violation of academic integrity codes will result in disciplinary action.</td>
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<tr>
<td>Write-Ups 7.5%</td>
<td>Collaboration on homework is encouraged, but turn in your own work.</td>
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<tr>
<td>Lab Participation 7.5%</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.