MATH 005  MATHMATICS CONCEPTS FOR ELEMENTARY SCHOOL TEACHERS I

INSTRUCTOR:

OFFICE:

TELEPHONE:

EMAIL:

OFFICE HOURS:


COURSE CONTENT:  This course is the first of a two-course sequence designed for the pre-service elementary school teacher. It is a mathematics content course with a college level approach, not a teaching methods course. The topics covered in this class encompass the California Mathematics Standards (i) Number and Quantity, (ii) Algebra and Functions, and (iii) Modeling and Problem Solving as recommended by the NCTM (National Council of Teachers of Mathematics) and the MAA (Mathematical Association of America.) In addition we will aim for the student to develop habits which embrace the eight Standards of Mathematical Practice (SMP) as stipulated in the California Common Core State Standards of Mathematics. These are: students will be proficient in

(1) Understanding problems and persevering in solving them,
(2) Reasoning abstractly and quantitatively,
(3) Constructing viable arguments and critiquing the reasoning of others,
(4) Modeling mathematical problems,
(5) Using mathematical and technological tools and knowing when the use of these tools is appropriate,
(6) Being rigorous in calculations and in mathematical communications,
(7) Identifying and using patterns and structures, and
(8) Being aware of repetition in mathematical processes.

LEARNING OUTCOMES/OBJECTIVES:

By the end of the semester, successful students will be able to:

- demonstrate facility in oral and written communication of mathematics. Correct computations and usage of mathematical symbols, language, and formulas will be expected in expressing clear communication of ideas and will be demonstrated in group peer work settings, at the blackboard, on exams, quizzes, and homework. (This addresses standards 3, 4, 6 in the SMP above)

- explain and apply problem-solving methods in mathematics. Students will demonstrate their progress in this goal orally in groups and at the board, and in writing on homework, quizzes, and exams. (This addresses standards 1, 2, 3, 4, 5, 7, and 8 in the SMP above)

- exhibit their knowledge of a specific group of mathematical facts and concepts in the three mathematical standard areas listed in the course content section. It is expected that students will spend considerable time outside of class on this goal. Students will demonstrate their capability in this area on homework, group work, boardwork, quizzes, and exams.
ACADEMIC HONOR CODE

Saint Mary's College expects every member of its community to abide by the Academic Honor Code. According to the Code, “Academic dishonesty is a serious violation of College policy because, among other things, it undermines the bonds of trust and honesty between members of the community.” Violations of the Code include but are not limited to acts plagiarism. For more information, please consult the Student Handbook at www.stmarys-ca.edu/your-safety-resources/student-handbook.

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ATTENDANCE POLICY: Each student is allowed a maximum of three hours of absence (excused or unexcused) from class during the semester. Please save them for when you are ill. Each detected absence beyond four will lower your final course grade. If you have an extended illness or emergency, please discuss it with me.

DETERMINATION OF COURSE GRADES:

1. Homework & Quiz Grade: Short quizzes will be given in class. There are no make-ups for missed quizzes. Written homework will be collected at the beginning of class on specified days (see our Moodle site.) Late homework of any type will not be accepted.

   The homework & quiz grade will be worth 100 points of your final grade. This will be done proportionally. For example, if your Homework & Quiz total is 1468 out of 1885 possible points then your score in this category is $\frac{1468}{1885} \approx 0.778 \approx 78\%$

2. Midterm Exams: There will be three 100 point exams given in class. There will be no make-up exams unless you have an extreme emergency that can be documented. Exams will be announced one week in advance. (Tentative dates are given on the course schedule)

3. Final Exam: There will be a comprehensive final exam (200 points).

4. The lowest exam score will be dropped (the final counts as two exam grades): So for example if your grades are as follows:

   **Example 1:**
   - Midterm I: 84
   - Midterm II: 78
   - Midterm III: 95
   - Final Exam: 142 (=71, 71)
   - Homework/Quiz: 70

   **Example 2:**
   - Midterm I: 84
   - Midterm II: 71
   - Midterm III: 95
   - Final Exam: 156 (=78, 78)
   - Homework/Quiz: 70

   In both examples a score of 71 would be dropped (Homework/Quiz grade cannot be dropped) and the grade would be computed: $\frac{84 + 78 + 95 + 71 + 70}{5} = 398 \div 5 = 79.6\%$ which is a B- (just barely!)

**Course grades:** 90 – 100% = A, 80-89% = B, 70-79% = C, 60-69% = D, below 60% = F.

*plusses and minuses will be assigned for borderline cases*
SOME MORE INFORMATION TO HELP YOU SUCCEED:

- It is expected that you will conduct yourself appropriately, with respect for each other, for faculty and staff, and for college property. You should expect that **much of your learning will take place outside of the classroom** and that you will take **Responsibility** for your education. This means that you must seek assistance when you need it, prepare for each class by completing all reading and writing assignments prior to coming to class, and realize that it is normal for you to leave the class period with questions and concepts that you will need to explore before your understanding is complete.

- **Study time:** Your grade is based on achievement, not effort! - The amount of time needed to master a subject varies by person. Nonetheless, it is rare to succeed in college mathematics courses unless one spends generally **at least** two or three solid hours outside of class for every hour in class. (-more during exam week.).

- Although the mathematics we will be studying in this course is mathematics that is learned in elementary school, you, as the future teacher, must understand these topics deeply so that you will know **why and how** each technique and concept is used. It is the utmost importance that you are able to explain mathematical concepts and know multiple methods of arriving at solutions of problems so you can assist your students in their learning.

- It is critical for your success that you attempt all of the homework problems... multiple times...until you can do the problems correctly without relying on examples in the book, your calculator, or someone’s help. Getting into good homework habits early will pay off later in the semester when time is more precious. Be able to do all the homework problems perfectly without notes before the exams!

- When you read your textbook, aim for comprehension. The textbook does not read like a novel as the reading needs to be slow-going and more careful. Read at your own pace with pencil and paper handy to work through the examples and fill in the omitted steps. **The lecture/discussion will make more sense if you have read the textbook beforehand.**

- **Show work** on quizzes, homework, and exams. I want to give you partial credit but if you have no work then you will earn no credit.

- **Homework:** When writing up your homework pretend it is something that you have to submit in a portfolio in your application for a teaching position. In other words use your homework to demonstrate your best work to me. Not all the problems will be graded. The assignment will have certain problems corrected and the entire assignment will be graded depending on neatness, completeness, and the correctness of the chosen graded problems. Solutions will be posted on our Moodle class site.

- You are allowed to discuss homework/practice problems with other students in the class but the write up of your problems must be your own...do not copy! You may also get help during the tutorial sessions, my office hours, or the evening (Sunday – Thursday) SMC (Student Math Center) in GAL 110 at 7-9 pm. This is a great place to work problems and ask questions.

- **Calculators will not be allowed** during quizzes/exams and classwork.

- All quizzes, exams, and extra credit problems must be done without assistance from any source or person, unless you are told otherwise. The **Academic Honor Code** will be upheld (see your Student handbook for complete information). However, I do encourage you to work on practice problems and to discuss the concepts of this course with other people in the class. There is a clear line between working with other students and exchanging work in an academically dishonest manner. It is fine to discuss homework with other students and to write while you do this, but it is not okay to copy what the other person is writing or saying. When I look at your homework write-ups I should not think that I have already graded one like it. It is not okay to exchange written solutions.

- **Talk to me** if you think you are getting lost or behind. This is a college math course and we must move along at a certain pace. We will seldom have time for review and questions. When you need some review, or have questions, or need some more discussion on a topic, please come to my office hours. These are your hours!!
SMC Athletes/Debate Team members: By September X I need a statement indicating your name, your sport, the class dates you will miss due to team commitments. This must be from your coach and signed by you.

Classroom etiquette: **Cell phones** must be turned off and put away before you enter our classroom; they may not be used for any purpose during class. If I hear or see your phone during the class period (yes, this means you cannot have it out on the desk) I will politely tell you to leave and the class period will count as an absence. Gum and food are not allowed in the classroom; water, soda, coffee, tea, etc. may be brought to class as long as you are careful and dispose of the container. **Laptop** computers are not to be used during class time; your focus should be on taking written notes and participating.

Write the **names, phone numbers, and emails** of four students in this class:
<table>
<thead>
<tr>
<th>MONDAY</th>
<th>WEDNESDAY</th>
<th>FRIDAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>8/31 Welcome &amp; Information Sheets</td>
<td>9/2 Polya’s Method of Problem Solving</td>
<td>9/4 Pattern Exploration in Problem Solving</td>
</tr>
<tr>
<td>Introduction to Problem Solving</td>
<td>9/9 Reasoning and Logic in Problem Solving</td>
<td>9/11 Numeration Systems</td>
</tr>
<tr>
<td>9/7 No class Labor Day</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9/14 Sets</td>
<td>9/16 Set Operations</td>
<td>9/18 Review for Exam</td>
</tr>
<tr>
<td>Algorithms for Multiplication and Division of Whole Numbers</td>
<td>9/30 More Algorithms for Multiplication and Division of Whole Numbers</td>
<td>10/2 Estimation in computations</td>
</tr>
<tr>
<td>9/28 Algorithms for Multiplication and Division of Whole Numbers</td>
<td>10/5 Divisibility Algorithms</td>
<td>10/9 Greatest Common Divisors and Least Common Multiples</td>
</tr>
<tr>
<td>10/7 Prime and Composite Numbers</td>
<td></td>
<td>10/12 Modular Arithmetic</td>
</tr>
<tr>
<td>10/14 Review</td>
<td></td>
<td>10/16 Exam II</td>
</tr>
<tr>
<td>10/12 Modular Arithmetic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MONDAY</td>
<td>WEDNESDAY</td>
<td>FRIDAY</td>
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</tr>
<tr>
<td>10/19</td>
<td>10/21</td>
<td>10/23</td>
</tr>
<tr>
<td>Integer Operations</td>
<td>Integer Operations</td>
<td>No class</td>
</tr>
<tr>
<td>10/26</td>
<td>10/28</td>
<td>Midterm Holiday</td>
</tr>
<tr>
<td>Rational Numbers</td>
<td>Addition, Subtraction, and Estimation of Rational Numbers</td>
<td></td>
</tr>
<tr>
<td>11/2</td>
<td>11/4</td>
<td>10/30</td>
</tr>
<tr>
<td>Rational Decimal Operations</td>
<td>Non-Terminating Decimals</td>
<td>Approaches to Multiplication and Division of Rational Numbers</td>
</tr>
<tr>
<td>11/9</td>
<td>11/10</td>
<td>11/6</td>
</tr>
<tr>
<td>Review</td>
<td></td>
<td>Percent and Interest</td>
</tr>
<tr>
<td>11/16</td>
<td>11/18</td>
<td>11/13</td>
</tr>
<tr>
<td>Algebra: Variables</td>
<td>Equations</td>
<td>Real Numbers</td>
</tr>
<tr>
<td>11/23</td>
<td>11/25</td>
<td>11/27</td>
</tr>
<tr>
<td>Functions</td>
<td></td>
<td>No class</td>
</tr>
<tr>
<td>11/30</td>
<td>12/2</td>
<td>12/4</td>
</tr>
<tr>
<td>The Cartesian Coordinate System</td>
<td>Graphing</td>
<td>Review</td>
</tr>
</tbody>
</table>

**FINAL EXAM PERIOD: TBA**
MATH 006  MATHEMATICS CONCEPTS FOR ELEMENTARY SCHOOL TEACHERS II

INSTRUCTOR:

OFFICE:

TELEPHONE:

EMAIL:

OFFICE HOURS:


COURSE CONTENT: This course is the second of a two-course sequence designed for the pre-service elementary school teacher. It is a mathematics content course with a college level approach, not a teaching methods course. Completing this course satisfies the Mathematical Understanding Core Curriculum Requirement (This needs to be applied for). The topics covered in this class encompass the California Mathematics Standards (i) Geometry, and (ii) Probability and Statistics as recommended by the NCTM (National Council of Teachers of Mathematics) and the MAA (Mathematical Association of America.) In addition we will continue working on your development of habits which embrace the eight Standards of Mathematical Practice (SMP) as stipulated in the California Common Core State Standards of Mathematics. These are: students will be proficient in

(1) Understanding problems and persevering in solving them,
(2) Reasoning abstractly and quantitatively,
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LEARNING OUTCOMES/OBJECTIVES:

By the end of the semester, successful students will be able to:

- demonstrate facility in oral and written communication of mathematics. Correct computations and usage of mathematical symbols, language, and formulas will be expected in expressing clear communication of ideas and will be demonstrated in group peer work settings, at the blackboard, on exams, quizzes, and homework. (This addresses standards 3, 4, 6 in the SMP above)

- apply abstract and logical reasoning in identifying patterns and solving problems in mathematics. Students will demonstrate their progress in this goal orally in groups and at the board, and in writing on homework, quizzes, and exams. (This addresses standards 1, 2, 3, 7, and 8 in the SMP above)

- exhibit their knowledge of a specific group of mathematical facts and concepts in the two mathematical content standard areas listed in the course content section. Students will also use mathematical and technological tools when appropriate. It is expected that students will spend considerable time outside of class on this goal. Students will demonstrate their capability in this area on homework, group work, boardwork, quizzes, and exams. (This addresses standard 1, 4, and 5 in the SMP above.)
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- Basic scientific calculators are required in class and on some quizzes and exams.

- All quizzes, exams, and extra credit problems must be done without assistance from any source or person, unless you are told otherwise. The **Academic Honor Code** will be upheld (see your Student handbook for complete information). However, I do encourage you to work on practice problems and to discuss the concepts of this course with other people in the class. There is a clear line between working with other students and exchanging work in an academically dishonest manner. It is fine to discuss homework with other students and to write while you do this, but it is not okay to copy what the other person is writing or saying. When I look at your homework write-ups I should not think that I have already graded one like it. It is not okay to exchange written solutions.

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<th>MONDAY</th>
<th>WEDNESDAY</th>
<th>FRIDAY</th>
</tr>
</thead>
<tbody>
<tr>
<td>2/8   Welcome &amp; Information Sheets</td>
<td>2/10   Displaying Data</td>
<td>2/12   Analyzing Data</td>
</tr>
<tr>
<td>Statistics Unit: Organizing &amp; Collecting Data</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2/15  Misleading Data and Statistics</td>
<td>2/17   Probability Unit: Probability And Simple Experiments</td>
<td>2/19   Probability And Complex Experiments</td>
</tr>
<tr>
<td>2/22  More Counting Techniques</td>
<td>2/24   Simulation and Expected Value</td>
<td>2/26   Odds and Conditional Probability</td>
</tr>
<tr>
<td>2/29  Review</td>
<td>3/2    Exam I</td>
<td>3/4    Geometry Unit: Recognizing Geometric Shapes</td>
</tr>
<tr>
<td>3/14  Describing Three Dimensional Shapes</td>
<td>3/16    Measurement with Standard and Non Standard Units</td>
<td>3/18   Length</td>
</tr>
<tr>
<td>3/28  Easter Break</td>
<td>3/30   Area</td>
<td>4/2    Surface Area</td>
</tr>
<tr>
<td>4/5   Volume</td>
<td>4/7    Review</td>
<td>4/7    Exam II</td>
</tr>
</tbody>
</table>

**MATH 6  Mathematics Concepts for Elementary School Teachers II  Spring 2016**

Tentative Class Schedule –
<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Date</th>
<th>Topic</th>
<th>Date</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>4/12</td>
<td>Congruence of Triangles</td>
<td>4/14</td>
<td>Similarity of Triangles</td>
<td>4/16</td>
<td>Constructions</td>
</tr>
<tr>
<td>4/19</td>
<td>Constructions</td>
<td>4/21</td>
<td>Geometric Problem Solving Using Triangle Congruence and Similarity</td>
<td>4/23</td>
<td>The Pythagorean Theorem</td>
</tr>
<tr>
<td>4/26</td>
<td>Distance and Equation of a Circle</td>
<td>4/28</td>
<td>Slope and Line in the Plane Coordinate System</td>
<td>4/30</td>
<td>Equations</td>
</tr>
<tr>
<td>5/3</td>
<td>Functions</td>
<td>5/5</td>
<td>Graphing Functions and equations</td>
<td>5/7</td>
<td>Geometric problem Solving Using Coordinates</td>
</tr>
<tr>
<td>5/10</td>
<td>Geometric problem Solving Using Coordinates</td>
<td>5/12</td>
<td>Review</td>
<td>5/14</td>
<td>Exam III</td>
</tr>
<tr>
<td>5/17</td>
<td>Plane Transformations</td>
<td>5/19</td>
<td>Plane Transformations</td>
<td>5/21</td>
<td>Review</td>
</tr>
</tbody>
</table>

**FINAL EXAM PERIOD: TBA**