Math 313 Topics in Elementary Mathematics - Algebra
Course Syllabus

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Fall 2105
W 7:25 – 10:05 PM
Calexico Campus

Required Textbooks
Reconceptualizing Mathematics by J. Sowder, L. Sowder, and S. Nickerson

Introduction
Welcome! What an opportunity for us to explore together the big ideas of mathematics, how people think when learning mathematical ideas, and how they use this knowledge to solve mathematical problems. This is a capstone course to help you develop a reinforced and sophisticated understanding of mathematics so that you may help your future students make sense of the mathematics that they are learning from you. Keep in mind, however, that making mathematics accessible to our students is difficult and is a journey that does not, or should not, end as one gains experience in the classroom. It is my underlying belief, that no teaching strategy is effective unless we ask the questions that will incorporate their way of thinking, experiences, and knowledge into their learning experience. After all, education involves both content (mathematics) and process (strategies to engage students). Welcome to this course and I look forward learning with you about how to improve the teaching of mathematics to our students.

Course Objectives
1. Develop a deeper understanding of the content of mathematics, specifically in the areas of Number Theory and Functions.
2. Reflect on your own learning as a venue to better understand how people learn mathematics.
3. Analyze and reflect on student solution strategies as a way to improve your understanding of how students think when solving mathematical problems.
4. Recognize and apply different representations of mathematical ideas to solve problems.

Course Requirements
1. Study the required readings (chapters 11 to 15).
2. Reflect and write about our class discussions and activities.
3. Participate in class activities and discussions.
4. Complete the examinations successfully.
Evaluation

Your final grade will depend on how well you complete the course requirements and how well you show that you have met the course objectives. Clarity of thought and expression, both in writing and in speaking, are very important for your success in this course. Using higher order thinking skills is the key to your earning a high grade in this course.

In order to maximize the opportunities we will have to understand better the big ideas of mathematics, we will always need to present ourselves, and our ideas, in a professional manner. Specifically,

- The work (content, presentation, timeliness) must be of the highest quality. Keep in mind that I may ask you to redo assignments to meet this requirement.
- Attendance is not optional and arriving on time, prepared to work together, is essential for the success of our academic community.
- Your grade will be reduced by 25 points each time that you are absent. Arriving late or leaving early will reduce your grade each time by 10 points.
- There are no make-ups for missed exams, classwork, or homework problems.
- Please keep in mind that excessive absences, tardiness and/or poor workmanship will impact your final grade in a negative manner for this course.

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<thead>
<tr>
<th>Activity</th>
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</thead>
<tbody>
<tr>
<td>Exam 1</td>
<td>120</td>
<td>Exam 2</td>
<td>180</td>
<td>Exam 3</td>
<td>120</td>
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<tr>
<td>Classwork &amp; Reflections</td>
<td>80</td>
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<td><strong>500 Total Possible Points</strong></td>
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5% Extra Credit Added to Each Exam: Homework Problems

Grading Standards

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<tr>
<th>Grade</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>A, A-</td>
<td>100%-90%</td>
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<tr>
<td>B+, B, B-</td>
<td>89%-80%</td>
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<tr>
<td>C+, C, C-</td>
<td>79%-70%</td>
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<tr>
<td>D+, D, D-</td>
<td>69%-60%</td>
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<tr>
<td>F</td>
<td>59%-00%</td>
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Course Catalog Description

(Prerequisite: Mathematics 311 or 312)

Capstone course for prospective K-8 teachers. Advanced topics in mathematics selected from algebra, number systems, transformational geometry, and problem solving. Enrollment limited to future teachers in grades K-8.
# Course Outline

## 8/26 Day One

**Areas of Focus: Patterns and Functions**
- Syllabus overview
- Numerical Patterns and Algebra, 12.3
- Functions and Algebra, 12.4

## 9/2 Day Two

**Areas of Focus: Patterns and Functions**
- Algebraic Reasoning About Quantities, 12.5
- More about Functions, 15.5

## 9/9 Day Three

**Areas of Focus: Algebra as a Language and as Generalized Arithmetic**
- Algebra as Symbolic Language, 12.1
- Algebra as Generalized Arithmetic, 12.2
- Introduction to Functions

## 9/16 Day Four – Exam 1 and Extra Credit Homework Due

**Areas of Focus: Assessment**
- Exam covers sections 12.1 12.2 12.3 12.4 12.5 15.5

## 9/23 Day Five

**Areas of Focus: Quantitative Approach to Algebra and Graphing**
- Using Graphs and Algebra to Show Quantitative Relationships, 13.1
- Understanding Slope: Making Connections across Quantitative Situations, Graphs, and Algebraic Equations, 13.2

## 9/30 Day Six

**Areas of Focus: Quantitative Approach to Algebra and Graphing**
- Linear Functions and Proportional Relationships, 13.3
- Nonlinear Functions, 13.4

## 10/7 Day Seven

**Areas of Focus: Understanding Change—Relationships among Time, Distance, and Rate**
- Distance-Time and Position-Time Graphs, 14.1
- Using Motion Detectors, 14.2

## 10/14 Day Eight

**Areas of Focus: Understanding Change—Relationships among Time, Distance, and Rate**
- Graphs of Speed against Time, 14.3
- Interpreting Graphs, 14.4
Course Outline [Continued]

10/21 Day Nine

Areas of Focus: Algebra as a Language and as Generalized Arithmetic

• Finding Linear Equations, 15.1
• Solving Two Linear Equations in Two Variables, 15.2

10/28 Day Ten

Areas of Focus: Algebra as a Language and as Generalized Arithmetic

• Different Approaches to Problems, 15.3
• Average Speed and Weighted Averages, 15.4

11/4 Day Eleven – Exam 2 and Extra Credit Due

Areas of Focus: Algebra as a Language and as Generalized Arithmetic

• Exam covers sections 13.1 13.2 13.3 13.4 14.1 14.2 14.3 14.4 15.1 15.2 15.3 15.4

11/18 Day Twelve

Areas of Focus: Number Theory

• Factors and Multiples, Primes and Composites, 11.1
• Prime Factorization, 11.2

12/2 Day Thirteen

Areas of Focus: Number Theory

• Prime Factorization, 11.2
• Divisibility Tests to Determine Whether a Number is Prime, 11.3

12/9 Day Fourteen

Areas of Focus: Number Theory

• Divisibility Tests to Determine Whether a Number is Prime, 11.3
• Greatest Common Factor, Least Common Multiple, 11.4

12/16 Day Fifteen – Exam 3 and Extra Credit Due

Areas of Focus: Assessment

• Exam covers sections 11.1 11.2 11.3 11.4

SDSU Disability Services

If you are a student with a disability and believe you will need accommodations for this class, it is your responsibility to contact Norma Aguilar at 760.768.5637 or Student Affairs at 760.768.5502. To avoid any delay in the receipt of your accommodations, you should contact Student Disability Services as soon as possible. Please note that accommodations are not retroactive, and that accommodations based upon disability cannot be provided until you have presented your instructor with an accommodation letter from Student Disability Services. Your cooperation is appreciated.