Math 210: Number Systems in Elementary Mathematics

SDSU Fall 2013: Course 21893 – Section 2

Tues/Thurs 8:00-9:15am in GMCS 325

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Office: GMCS 506
Office Hours: Tuesday 9:30 - 10:30 am
Thursday 9:30 - 10:30 am

Text: Reconceptualizing Mathematics for Elementary School Teachers, Second Edition (Sowder, Sowder, & Nickerson, 2012). We will cover chapters 1-7, and some of 8 if time permits.

Course Catalog Description: Number sense, operation concepts, estimation, mental arithmetic, algorithms, problem solving, whole, rational, real numbers, ratio, and number theory.

Student Learning Outcomes:

1. Solve mathematics problems using quantitative analysis, recognizing quantities and relationships.
2. Understand place value numeration systems – convert to and operate in bases other than base ten.
3. Understand, and be able to explain, the algorithms for operating on rational numbers.
4. Understand the importance of the referent unit.
5. Understand the different meanings and different representations for rational numbers, and have facility in changing from one representation to another.
6. Understand that quantities can be compared multiplicatively or additively depending on the situation. Ability to determine if a situation is additive or multiplicative, and what approach is appropriate.

 Philosophy and Goals: The first course of a series of four courses, Math 210 Number Systems in Elementary Mathematics challenges you to take a deeper look at “elementary mathematics,” to expand your understanding of why and how math works. You will be asked to think about, and often rethink, the way you view mathematical ideas, reasons, goals and relationships. The focus will not be on mathematical calculations, although arithmetic is certainly important, but on the concepts behind each problem (i.e. the “big idea”) and how that problem may relate to others. Through active learning and inquiry-oriented problem solving, we will challenge and sharpen your problem solving skills. You will also be able to look and solve arithmetic operations in different ways - utilizing mental math and the concepts behind common algorithms. Finally, you will be able to understand and demonstrate how fractions, percentages, decimals and ratios relate.

This course is designed to give you the tools you need to deepen your own understanding, in order to give your future students the best possible platform from which to learn mathematical concepts.

Expectation: I expect you to come to each class ready to participate; whether in class discussions, small problem solving groups, or lecture. Be ready to explain your reasoning forwards and backwards. Learning exercises are to be completed in a timely fashion in order to facilitate the learning process. Reading the book as we go along is a must.

Participation: There are two components of participation in this course. Part of this corresponds to your participation in class, as regards group activities and discussions. The rest will correspond to completion of online activities, such as watching videos and taking LearningCurve Quizzes. We will discuss these in more detail as they appear in the course.
Learning Exercises: Learning exercises (read: homework) will be assigned as we cover sections in class, and will be turned in for a grade once a week. Assigned learning exercises will be posted online, along with the due dates. Late homework will not be accepted, except in cases of emergency. It is highly recommended you complete each homework assignment in order to understand the content of each section and prepare for exams.

Exams: Each of the two exams as well as quizzes will be held in class during regular meeting hours. Make up exams and quizzes will only be allowed with a university excused absence, or prior approval from the instructor (me).

The final exam, a department final developed by a committee including 210 instructors and the course coordinator, will be held on SATURDAY MAY 10th from 1:00 – 3:00 PM. Past finals have included True/False and free-answer questions. I will score your final, in a manner consistent with the scoring of quizzes and exams.

Grading/Attendance:

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<th>Participation</th>
<th>15% (10% in-class, 5% online)</th>
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<tr>
<td>Quizzes</td>
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<td>Learning Exercises</td>
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<td>Midterm</td>
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<td>Final Exam</td>
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You are expected to attend class. Excessive unexcused absences will deduct from your participation score. If you do miss class, be sure to talk to a classmate to take a look at important class notes, discussions, and problems you missed.

Grading Scale:

- 93% - 100% = A
- 90% - 92% = A-
- 88% - 89% = B+
- 83% - 87% = B
- 80% - 82% = B-
- 78% - 79% = C+
- 73% - 77% = C
- 70% - 72% = C-
- 68% - 69% = D+
- 63% - 67% = D
- 60% - 62% = D-
- 59% and below = F

*Please note: in order for your grade to count for Liberal Studies majors you must achieve C (73%) or higher*

Class Policies:

- Respect yourself, respect your neighbors, respect your environment
- No cell phones (texting, calling, playing, listening, ringing, etc)
- Cheating yourself and others is not tolerated. Although group collaboration is encouraged, write-ups of solutions should be an individual effort. Read the official school statement (accompanying this handout) for more details on what constitutes cheating, and possible consequences.

*This syllabus and schedule are subject to change. If you are absent from class, it is your responsibility to check on announcements made while you were absent.*
Official School Policies

**Statement on Cheating and Plagiarism:** Cheating is the actual or attempted practice of fraudulent or deceptive acts for the purpose of improving one’s grade or obtaining course credit; such acts also include assisting another student to do so. Typically, such acts occur in relation to examinations. However, it is the intent of this definition that the term ‘cheating’ not be limited to examination situations only, but that it include any and all actions by a student that are intended to gain an unearned academic advantage by fraudulent or deceptive means. Plagiarism is a specific form of cheating which consists of the misuse of the published and/or unpublished works of others by misrepresenting the material (i.e., their intellectual property) so used as one’s own work. Penalties for cheating and plagiarism range from a 0 or F on a particular assignment, through an F for the course, to expulsion from the University. For more information on the University’s policy regarding cheating and plagiarism, refer to the Schedule of Courses (‘Legal Notices on Cheating and Plagiarism’) or the University Catalog (‘Policies and Regulations’).

**Americans with Disabilities Act (DA) Accommodation:** The University is committed to providing reasonable academic accommodation to students with disabilities. The Student Disability Services Office provides university academic support services and specialized assistance to students with disabilities. If you are a student with a disability and believe you will need accommodations for this class, it is your responsibility to contact Student Disability Services at (619) 594-6473. 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 I cannot provide accommodations based upon disability until I have received an accommodation letter from Student Disability Services. Your cooperation is appreciated.

**Religious Observances:** University Policy on Absence for Religious Observances includes the following statements: “By the end of the second week of classes, students should notify the instructors of affected courses of planned absences for religious observances. Instructors shall reasonably accommodate students who notify them in advance of planned absences for religious observances.” Please notify the instructor in a timely manner and a reasonable accommodation will be reached.

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