

MATH 301A-01
Fundamental Concepts of Arithmetic and Geometry for Educators
Winter 2010 – MWF 12:00-1:10 in TC 13

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Office Hours: MWF 10:00-11:30 a.m. and by appointment.

Text: *Math for Teachers, an Exploratory Approach*, Second Edition, by Robert G. Stein with Laura Wallace. We will be covering chapters 1-8.3.

Supplies Needed: Three-ring binder, paper (either notebook paper or graph paper), ruler, scissors, and colored pencils. Optional manipulatives: Cuisenaire rods, base-ten blocks, algebra tiles.

Course Description: We will be discussing the mathematical reasoning behind the structure and arithmetic of real numbers and the connections between numbers and geometry (Chapters 1-8). See the course outline below for specific topics.

The goals for the course are as follows:

- to review and master the basic computational and procedural skills in arithmetic and geometry
- to develop conceptual understanding of upper-elementary mathematics
- to discover and discuss why basic algorithms work
- to develop higher order thinking skills necessary for problem solving
- to explain mathematics both orally and in writing
- to consider ways of teaching the material.

These goals are consistent with the goals for students in grades K-12 as outlined in *Mathematics Framework for California Public Schools* adopted by the California State Board of Education, March 2005 and also with the recommendations for the preparation of teachers of mathematics by the Mathematical Association of America.

Included in these recommendations is the following statement:

“A teacher of mathematics must “possess knowledge and have an understanding of mathematics that is considerably deeper than that required for the school mathematics they will teach.”

Please visit www.cde.ca.gov/ci/ma/cf and www.maa.org for more information.

Prerequisites: Completion of Math 115 and the general education requirements in written communication, oral communication, and critical thinking.

Course Requirements: To pass this course, you must demonstrate competency in basic skills, achieve a score of 65% or better on the final exam, and have an overall average of 70% or better on homework, midterms, and the final. See the grading scale below.

Homework: Problems from each section will be assigned daily and collected each week. To receive full credit homework must be done neatly, in an organized fashion, and show all steps. An answer to a question isn't as important as your explanation of how to get the answer. When you are writing up your homework problems pretend that one of your future students will be reading it. Therefore, be precise! Please staple your pages if you have more than one page. You may work together with other students on homework, but please make sure that the work is your own. Significantly identical homework assignments will not be accepted. No late homework, for any reason, will be accepted, with the exception of a one-week grace period on one assignment. Also, your lowest homework score will be dropped.

Explorations: In addition to the regular homework problems, you will be required to complete two math explorations from the book which will be opportunities for independent investigations of supplemental or enrichment topics. We will not necessarily cover these topics in class. These investigations will be assigned as we go along – due dates to be announced. Please do the explorations on one side of paper and treat them as mini-projects. Give as much details as possible so that someone who reads your paper can understand the exploration without having to refer to the text. Your score will be based on completeness, accuracy, thoroughness of explanations, and neatness/organization! You may ask classmates or me for help, but the work must be your own – significantly identical work will not be accepted. No late explorations will be accepted.

Exams: There will be two midterms during the quarter that will take place during weeks 4 and 8. The exams will feature questions related to explaining how to use manipulatives, using alternative algorithms, solving contextual problem, etc. The final exam will be cumulative and will have a basic skills section that will be to mainly ensure that you have mastered the arithmetic and basic concepts of whole numbers, integers, fractions, and decimals. You must score at least 85% on the basic skills section of the final exam to pass the course. No make-ups will be given (unless you have a written verifiable excuse), and no calculators on exams.

GRADE BREAKDOWN:

Homework	20%
Explorations	10%
Midterm 1	20%
Midterm 2	20%
Final Exam	30%

GRADING SCALE:

If you pass 85% of basic skills questions and get an overall percentage of 65% or better on the final exam, then letter grades will be assigned according to your overall course percentage as follows with +/- grades being assigned in the upper and lower ends of each range (with the exception of A+). This course is graded as ABC/No credit.

A	90-100
B	80-89
C	70-79
NC	69 or less

Important Information:

If you are in need of an accommodation for a disability in order to participate in this class, please let me know ASAP and contact Services to Students with Disabilities at UH-183, (909) 537-5238.

State Mandated Reduction in Direct Instruction

Faculty are contractually forbidden to provide instruction on six workdays this term. The daily schedule below reflects days when classes will not meet and also additional days when the instructor is not permitted to engage in such activities as meeting with students, advising, grading tests, responding to student work, writing letters of recommendation, and answering course-related e-mail (see "My State Budget Furlough Days" below). Faculty have also been asked to assign students additional course work to make up for omitted class meetings and otherwise to assure that students fully earn any credit hours they receive for this course.

H1N1 (Swine Flu) and Attendance: To avoid a pandemic outbreak of H1N1, the campus is encouraging students, faculty, and staff to stay at home if they have any flu-like symptoms instead of coming to campus. So if you think you may have the flu, please stay home. You will NOT need to bring a doctor's note to excuse your absence. Please send me an email message to let me know that you will be absent.

Keep in mind that we will be covering a lot of material in ten weeks. Try not to fall behind. Even though the homework is collected only once a week, try to do the problems as soon as possible after we cover the material in class. We can answer/present homework questions at the beginning or end of a class, but we may not have time in class to answer all homework questions. Please come see me in my office for extra help if you need it. I am more than happy to help with any problems you may be having!

Please turn off all cell phones and other electronic devices including those requiring headphones! Thank you!

Important Dates:

January 15 - Last day to add via My Coyote Self Service
January 18 - Martin Luther King Holiday, campus closed
January 19 - My State Budget Furlough Day
February 1 - Census date, Last day to drop via My Coyote without record
February 5 – **Midterm 1**
February 12 - State Budget Closure Day
February 25 - My State Budget Furlough Day
March 2 - State Budget Closure Day
March 5 – **Midterm 2**
March 11 - My State Budget Furlough Day
March 22 - Last day of class
March 24 - FINAL EXAM, 12:00-1:50 p.m.
April 5 – Grades available via My Coyote

**MATH 301A Course Outline
(Tentative Schedule/Main topics)**

Week	Chapters/Topics
1	Chapter 1 – Box Puzzles- Applications to the Properties of Real Numbers Introduction to Cuisenaire rods Algorithms (standard/nonstandard) for addition and multiplication of whole numbers Using area of rectangles to illustrate multiplication Introduction to base-ten place value/base-ten blocks/algebra tiles
2	Chapter 1 – Continued Chapter 2 – Introduction to integers Addition of integers on the number line and using algebra tiles Multiplication of integers using algebra tiles More Box Puzzles
3	Chapter 3 – Figurate Numbers in two and three dimensions Representing patterns through pictures and verbal rules Chapter 4 – Understanding Number Theory Concepts Multiples, factors, and prime numbers Prime factorization of whole numbers
4	Chapters 4 – Continued Midterm 1 (Chapters 1-4)
5	Chapter 5 - Introduction to exponents The Least Common Multiple The Greatest Common Factor Chapter 6 - Methods of Subtraction
6	Chapter 6 – Methods of Subtraction continued Methods of Division Order of Operations
7	Chapter 7 – Introduction to Fractions Understanding the concept of a fraction Modeling fractions (Cuisenaire rods, pattern blocks) Equivalent Fractions and proportional reasoning
8	Chapter 7 - Operations on Fractions Midterm 2 (Chapters 5-7.1,7.2)
9	Chapter 7 - Continued Chapter 8 – Introduction to decimals/Understand Place Value and Decimal Numeration
10	Chapter 8 - Decimals as Fractions, Operations on decimals