SMTE 1350.001, 002: Fundamentals of Math I  
Spring 2013

I. COURSE INFORMATION

Instructor:  Elaine Young  
Phone: (361) 825-2819  
Office: CI-360  
E-mail: elaine.young@tamucc.edu  
Webpage: http://faculty.tamucc.edu/eyoung/1350/index.html  
Office hours:

II. COURSE DESCRIPTION

This course provides the conceptual framework for understanding and applying properties, models and operations of number systems in a problem solving setting. Most students in this course have learned mathematics through a rule-based, abstract instructional program. This course is designed to emphasize in-depth basic understandings of number systems and arithmetic patterns, which are core ideas in the elementary mathematics curriculum. Communicating concepts, processes or solutions effectively, in oral and written forms, will be emphasized. This course is intended for students seeking certification in elementary education, bilingual education, special education, and BSIS 4-8 programs. The course will cover chapters 1-6 in the textbook.

III. PREREQUISITES for the COURSE: College Algebra or placement beyond

IV. TEXTS and OTHER SUPPLIES REQUIRED

- Scientific calculator
- Principles and Standards for School Mathematics, NCTM, 2000 (online)
- TEKS (http://www.tea.state.tx.us/rules/tac/chapter111/index.html)
- Family Math Night materials up to $5

V. STUDENT LEARNING OUTCOMES

Sequences & mathematical reasoning
- Identify patterns, predict next term, find and apply formulas for arithmetic, geometric, Fibonacci, “see-and-say”, exponential \((n^x)\), and power sequences \(2^n\)
- Model sequences concretely, visually and abstractly
- Investigate interesting subsets of the natural numbers (evens/odds, powers of two, Fibonacci numbers, triangular numbers and perfect squares)

Number systems
- Compare and contrast number systems (additive, subtractive, character, place value)
- Identify the structure and chart the relationships in the real number system
- Describe the roles of zero, one, face and place values in the base ten system
- Recognize and analyze standard and non-standard algorithms for binary operations on whole numbers
- Recognize and apply properties of real numbers

Prime & composite numbers
- Explain two or more reasons why one is not a prime number
- Develop full definitions of prime and composite numbers
- Identify prime numbers between 1-100 and find prime numbers greater than 100
- List all factors of a given whole number
- Determine the prime factorization of a given whole number
- Find GCF/LCM for a set of whole numbers

Integers
- Analyze, explain and model binary operations on integers

Rational numbers
- Model fractions using Pattern blocks and Fraction bars
- Model fraction operations using Pattern blocks, Fraction bars and Area model
- Explain and justify traditional algorithms for binary operations on fractions
- Explain why rational numbers are dense on the real numbers
- Order a set of fractions from smallest to greatest
- Find at least two fractions between a given pair of fractions

Mathematical processes
- Make conjectures and use deductive methods to evaluate the validity of conjectures
- Recognize that a mathematical problem can be solved in a variety of ways, evaluate the appropriateness of various strategies, and select an appropriate strategy for a given problem
- Evaluate the reasonableness of a solution to a given problem
- Explore problems using verbal, numerical and physical representations

Mathematical Perspectives
- Appreciate the contributions that different cultures have made to the field of mathematics
- Understand and apply how mathematics progresses from concrete to representation to abstract generalizations

Communication
- Communicate mathematical ideas and concepts in oral, written and visual forms
- Use mathematical processes to reason mathematically, solve mathematical problems, make mathematical connections within and outside of mathematics, and communicate mathematically
- Translate mathematical statements among developmentally appropriate standard English, mathematical language, and symbolic mathematics

Technology
- Use appropriate technology such as calculators, computer software, and the Internet to explore, research, solve, and compare mathematical situations and problems

Professional Development
- Be familiar with the National Council of Teachers of Mathematics and the Principles and Standards for School Mathematics, the NCTM website, and NCTM journals

VI. INSTRUCTIONAL METHODS and ACTIVITIES
The course will be a combination of lectures, individual work and group work, as well as professional development activities. Students are expected to participate in group and whole class discussions by contributing with knowledge and thoughtful evaluation of the contribution of others. Using physical models to teach the content topics and understanding how learning occurs through their use will be a substantial portion of the class instructional plan.

VII. EVALUATION and GRADE ASSIGNMENTS

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<th>Assignment</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Homework</td>
<td>25%</td>
<td>A &gt; 90%</td>
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<td>Class presentations</td>
<td>25%</td>
<td>B 80% - 89%</td>
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<td>Family Math Night</td>
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<td>C 70% - 79%</td>
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<td>Final Exam</td>
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VIII. TENTATIVE COURSE SCHEDULE: online at http://faculty.tamucc.edu/eyoung/

IX. CLASS POLICIES

Homework: this category includes homework, in-class assignments, mathematics journals, and quizzes. All homework is due before or at the beginning of the next class. Please use standard document software and attach your journal to your email message. It is your responsibility to ensure that I receive and am able to open/read all attached assignments. I will always acknowledge receipt of email messages.

Fraction mastery quiz: you must pass this mastery quiz with a 75% score to pass this course. You may not use a calculator on this quiz, but please do use your brain!

Class presentations: your group will present a number system project to the class. Details are on the course website. Attendance is required for all class presentation days; tardies or absences will affect your own presentation grade.

Family Math Night: an important avenue for applying what you learn in class to actual real life situations that will prepare you for teaching. Please note that the FMN will be scheduled on a weekday evening. This activity is outside of normal class periods but is required for the course. A compensation day will be scheduled where we will not have class. Please prepare for these activity dates if you need transportation, child care, or excuses from other classes or work. If you cannot attend FMN there is an alternate assignment (see course webpages).

Final exam: the final exam will be cumulative. A review sheet can be found on the course website. Please make sure your summer plans allow attendance on the day of the final exam. No one will be able to take the final exam earlier than the scheduled day.

Absences, make-up work and late work: for any absence with a documented excuse, you may make up the work and turn it in the next class period. Please notify the instructor (and your table group) before class if you are going to be absent. Work will only be accepted late if prior arrangements are made with the instructor. Late work will accrue a 10% penalty for every weekday it is late. The final date for late work to be submitted is 7 May 2013.

Academic Integrity/Plagiarism: University students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, such as illicit possession of examinations or examination materials, falsification, forgery, complicity or plagiarism. (Plagiarism is the presentation of the work of another as one’s own work.) In this class, academic misconduct or complicity in an act of academic misconduct on an assignment or test will result in a zero grade.

Dropping a Class: I hope that you never find it necessary to drop this or any other class. However, events can sometimes occur that make dropping a course necessary or wise. Please consult with me before you decide to drop to be sure it is the best thing to do. Should dropping the course be the best course of action, you must initiate the process to drop the course by going to the Student Services Center and filling out a course drop form. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. November 2nd is the last day to drop a class with an automatic grade of W.

Grade Appeals: As stated in University Rule 13.02.99.C2, Student Grade Appeals, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is encouraged to first discuss the matter with the instructor. For complete details, including
the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Rule 13.02.99.C2, Student Grade Appeals, and University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules Web site at http://www.tamucc.edu/provost/university_rules/index.html. For assistance and/or guidance in the grade appeal process, students may contact the Office of Student Affairs.

Disabilities Accommodations: The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please call or visit Disability Services at (361) 825-5816 in Corpus Christi Hall, Room 116.

Veterans: If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.