SMTE 1351.003: Fundamentals of Math II
Tuesday/Thursday 5:30-6:45 p.m.  CS 107

Spring 2012

I. COURSE INFORMATION

Instructor: Mrs. Christine Peters
Phone: 825-5827
E-mail: christine.peters@tamucc.edu
Office: CI 308
Office Hours: Tuesday/Thursday 5:00-5:30

II. COURSE DESCRIPTION

The conceptual framework for understanding and applying properties, models and operations related to various data systems in problem solving settings.
This research-based course provides the conceptual framework for increased understanding and application of rational numbers, probability, and statistics. Communicating concepts, processes or solutions effectively, in oral and written forms, will be emphasized. 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. The course will cover chapters 7, 9-10 in the textbook.

III. PREREQUISITES for the COURSE

MATH 1314: College Algebra or equivalent
SMTE 1350: Fundamentals of Math I

IV. TEXTS and OTHER SUPPLIES REQUIRED

Required:

- Scientific calculator
- TEKS (http://www.tea.state.tx.us/rules/tac/chapter111/index.html)
- Principles and Standards for School Mathematics, NCTM, 2000 (online)

V. STUDENT LEARNING OUTCOMES

A student will:

Rational & irrational numbers
- Define and distinguish between rational and irrational numbers
- Recognize that situations that have no solution in the rational number system have solutions in the real number system

Decimals
- Demonstrate a sense of quantity, relationship, and equivalency for fractions, decimals and percents
- Identify face/place values and expanded form for decimal numbers
- Determine when zero is a significant/insignificant digit
- Model decimals using decimal grids (area models)
- Model binary operations on decimals using decimal grids (area models)
- Analyze common error patterns for operations on decimals
- Explain and justify traditional algorithms for binary operations on decimals
- Convert between fraction, decimal, and percent form for rational numbers
- Appropriately round decimals to a given place value
- Order a set of decimals from smallest to greatest
- Find at least two decimals between a given pair of decimals

Percent
- Convert between fraction, decimal, and percent form for rational numbers
- Calculate and explain percent change (percent increase and percent decrease)
- Model percent using decimal grids
- Recognize, interpret, and evaluation appropriateness of percents less than 1% and greater 100%

Ratio & proportion
- Model and solve proportional problems using concrete, numeric, tabular, graphic and algebraic methods

Exponents & roots
- Simplify roots and approximate roots using a calculator
- Apply operations and properties of exponents and roots for rational numbers

Probability
- Describe and compute the outcome of simple and compound events
- Explore concepts of probability through data collections, experiments & simulations
- Create, use and interpret tree diagrams for simple, conditional and joint probabilities
- Compute odds and convert to/from probabilities
- Compute permutations and combinations for real-world scenarios

Statistical graphs
- Investigate and answer questions by collecting, organizing and displaying data from real-world situations
- Support arguments, make predictions and draw conclusions using summary statistics and graphs to analyze and interpret one-variable data
- Communicate the results of a statistical investigation using appropriate language
- Design, conduct, analyze and interpret surveys and statistical experiments
- Create and interpret graphs (pie graph, pictograph, bar graph, histogram, line plot, line graph, map chart, frequency polygon, stem & leaf plot, scatterplot) to communicate mathematical information
- Approximate the line of regression on a scatterplot and explain the trend
- Show awareness of quality graphs and possible abuses of statistical graphs

Statistical measures
- Describe and compute measures of centrality (mean, median, mode) and measures of dispersion (range, IQR, variance, standard deviation)

Normal curve
- Use the graph of the normal distribution to make inferences about a population
- Compute and interpret z-scores and percentiles for a given data set
- Compare two data sets using z-scores

In the context of the above expectations, a student will --

Mathematical processes
- 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
- Use physical and numerical models to represent a given problem or mathematical procedure
- Recognize that assumptions are made when solving problems and identify and evaluate those assumptions

Mathematical Perspectives
- Understand and apply how mathematics progresses from concrete to representation to abstract generalizations

Communication
- Communicate mathematical ideas and concepts in age-appropriate oral, written and visual forms for a class presentation
- Use mathematical processes to reason mathematically, solve mathematical problems, make mathematical connections within and outside of mathematics, and communicate mathematically
- Reflect on personal learning, change of attitude and beliefs, and growth in understanding through mathematical journaling
- Translate mathematical statements among developmentally appropriate language, standard English, mathematical language, and symbolic mathematics

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

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, and group work. 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, is a substantial portion of the class instructional plan.
## VII. EVALUATION and GRADE ASSIGNMENT

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Weight</th>
<th>Grade Range</th>
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<tbody>
<tr>
<td>Homework</td>
<td>25%</td>
<td>A &gt; 90%</td>
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<tr>
<td>Quizzes</td>
<td>25%</td>
<td>B 80% - 89%</td>
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<tr>
<td>Tests</td>
<td>25%</td>
<td>C 70% - 79%</td>
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<tr>
<td>Final Exam</td>
<td>25%</td>
<td>D 60% - 69%</td>
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<td></td>
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<td>F &lt; 60%</td>
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## VIII. TENTATIVE COURSE SCHEDULE

<table>
<thead>
<tr>
<th>WEEK</th>
<th>TOPIC</th>
<th>CONTENT</th>
<th>SECTION</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction</td>
<td>Pre-assessment; review rational &amp; irrational numbers</td>
<td></td>
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<tr>
<td>2</td>
<td>Decimal numbers</td>
<td>Face/place value, expanded form, conversion to/from fractions</td>
<td>7.1</td>
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<tr>
<td>3</td>
<td>Decimal numbers</td>
<td>Modeling decimals, decimal operations</td>
<td>7.2</td>
</tr>
<tr>
<td>4</td>
<td>Percent</td>
<td>Percent, percent change; conversion to/from fractions &amp; decimals</td>
<td>7.4</td>
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<tr>
<td>5</td>
<td>Ratio &amp; proportion</td>
<td>Ratio and proportion</td>
<td>7.3</td>
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<tr>
<td>6</td>
<td>Ratio &amp; proportion</td>
<td>Applications of Proportional Reasoning</td>
<td>7.3</td>
</tr>
<tr>
<td>7</td>
<td>Statistical graphs</td>
<td>Discrete &amp; continuous data graphs</td>
<td>9.1</td>
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<tr>
<td>8</td>
<td>Statistical graphs</td>
<td>Constructing &amp; reading graphs</td>
<td>9.1</td>
</tr>
<tr>
<td>9</td>
<td>Statistical graphs</td>
<td>Stem &amp; leaf plots, scatter plots, abuse of graphs</td>
<td>9.1</td>
</tr>
<tr>
<td>10</td>
<td>Measures</td>
<td>Measures of centrality &amp; dispersion</td>
<td>9.2</td>
</tr>
<tr>
<td>11</td>
<td>Normal curve</td>
<td>Normal curve z-scores &amp; percentiles</td>
<td>9.3</td>
</tr>
<tr>
<td>12</td>
<td>Experimental</td>
<td>Outcomes, sample space</td>
<td>10.1</td>
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<tr>
<td>13</td>
<td>Probability</td>
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<tr>
<td>14</td>
<td>Combinations</td>
<td>Factorials, formulas for permutations and combinations &amp; Problem solving with permutations and combinations</td>
<td>10.2</td>
</tr>
<tr>
<td>15</td>
<td>Probability</td>
<td>Factorials, formulas for permutations and combinations &amp; Problem solving with permutations and combinations</td>
<td>10.3</td>
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<tr>
<td>16</td>
<td>Final exam</td>
<td>May 8, 2011 4:30-7:00 PM</td>
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## IX. CLASS POLICIES

**Academic Honesty.** 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, forgery or plagiarism.

**Notice to Students with Disabilities.** Texas A&M University-Corpus Christi complies with the Americans with Disabilities Act in making reasonable accommodations for qualified students with disabilities. If you suspect that you may have a disability (physical impairment, learning disability,
psychiatric disability, etc.), please contact the Services for Students with Disabilities Office, located in Driftwood 101, at 825-5816. If you need disability accommodations in this class, please see me as soon as possible.

**Grade Appeal Process.** 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.C1.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules Web site at [http://www.tamu.edu/provost/university_rules/index.html](http://www.tamu.edu/provost/university_rules/index.html). For assistance and/or guidance in the grade appeal process, students may contact the Office of Student Affairs.

**X. REFERENCES**


SBEC Technology Standards for Beginning Teachers


Texas Essential Knowledge and Skills for Technology Applications