COURSE SYLLABUS: Math 185, 3 credit hours, Summer 2008
FOUNDATIONS OF MATHEMATICS FOR ELEMENTARY TEACHERS (II)

CLASSROOM AND SCHEDULE: 8:00 – 10:00 am, Monday - Friday, LDB 431

INSTRUCTOR:
Dr. Beth Cory
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FAX: 936-294-1882
Office Hours: 10:00 am – 12:00 pm Monday – Friday (except on the Fridays that class does not meet).
              Many other times available by appointment, email, or simply dropping by

COURSE OBJECTIVES/COURSE DESCRIPTION:
This course is the second in a series of courses designed to develop the necessary foundations in mathematics for prospective elementary teachers. Students are expected to practice communications skills and participate in hands-on activities, including the use of math manipulatives and technology. Topics will include National and Texas standards for teaching mathematics, decimals, the real number system, geometry, and measurement. Throughout the course, the five main themes recommended by the NCTM Principles and Standards (problem solving, reasoning, communication, connections, and representation) will be emphasized. Students will also participate in class discussions and group work during this course.
Prerequisite: Math 184 with a grade of C or better. 3 semester hours.

COURSE OBJECTIVES:
Upon completion of this course, students will be able to:
- Select appropriate representations of decimals and percents for particular situations
- Demonstrate an understanding of a variety of models for representing decimals and percents
- Work proficiently with decimals and their operations
- Use a variety of concrete and visual representations to demonstrate the connections between decimal operations and algorithms
- Solve ratio and proportion problems
- Select and use appropriate units of measurement (e.g., temperature, money, mass, weight, area, capacity, density, percents, speed, acceleration) to quantify, compare, and communicate information
- Develop, justify, and use conversions within measurement systems
- Describe the precision of measurement and the effects of error on measurement
- Apply the Pythagorean theorem and proportional reasoning, to solve measurement problems
- Understand concepts and properties of points, lines, planes, angles, lengths, and distances
- Analyze and apply the properties of parallel and perpendicular lines
- Use the properties of congruent triangles to explore geometric relationships
- Use and understand the development of formulas to find lengths, perimeters, areas, and volumes of basic geometric figures
- Apply relationships among similar figures, scale, and proportion and analyze how changes in scale affect area and volume measurements
- Use a variety of representations (e.g., numeric, verbal, graphic, symbolic) to analyze and solve problems involving two- and three-dimensional figures such as circles, triangles, polygons, cylinders, and prisms
- Use translations, reflections, glide-reflections, and rotations to demonstrate congruence and to explore the symmetries of figures
- Use dilations (expansions and contractions) to illustrate similar figures and proportionality
- Use symmetry to describe tessellations and shows how they can be used to illustrate geometric concepts, properties, and relationships

REQUIRED TEXT AND MATERIALS:
Long, Calvin and DeTemple, Duane W. (2006). *Mathematical Reasoning for Elementary Teachers* (Fourth Edition). Boston, MA: Pearson Education, Inc.
Supplemental materials provided by the instructor.

MATERIAL TO BE COVERED:

Chapter 7	Decimals and Real Numbers	All sections: 7.1 – 7.4
Chapter 11	Geometric Figures	Sections 11.1 – 11.3
Chapter 13	Transformations	All Sections: 13.1 – 13.3
Chapter 14	Congruence & Similarity	Sections 14.1 and 14.3
Chapter 12	Measurement	All sections: 12.1 – 12.4

SUPPLIES: To be prepared for action during each class, you will need to have: Colored pencils, pens, markers, and/or crayons.

ATTENDANCE: Regular and punctual attendance is expected of every student. As a prospective teacher, you must demonstrate your reliability and conscientious attitude by your faithful attendance. Attendance will be taken every class. Any student who is more than 30 minutes late to class will be counted absent. Tardies will count against your attendance record (3 tardies -1 absence). Unless approved by the instructor, leaving class early will count as an absence. If absent or tardy, you are still responsible for all material covered in class, and you will need to check with a classmate about what was discussed. **If you have <u>2 or fewer absences,</u>** <u>I will add 7 extra credit points to your lowest test grade.</u>

In addition to attending class faithfully, students are expected to put forth their best effort in this class. If you do not participate appropriately in class discussions and activities, are sleeping in class, are doing other homework, are talking when I am talking or when a classmate is talking, etcetera (see the section Classroom Rules of Conduct below), you are not demonstrating the professional attitude required to be a teacher. Not only are you missing instruction when talking, but you are also preventing the learning of those students sitting near you. **For each class period during which you exhibit a lack of participation or a lack professionalism, you will counted as absent for the day.** Severe problems in the area of professionalism may result in a letter grade drop at the discretion of the instructor.

ASSIGNMENTS: Each day, I will assign a number of homework problems. I will not collect these, but problems on the midterm and final exams will be similar to these problems.

I <u>will</u> collect four assignments throughout the semester. These four assignments are described later in the syllabus. **NO LATE WORK WILL BE ACCEPTED**. If you know that you will be absent, you may turn in your assignment early, drop it by my office, or send it by email/fax by class time of the due date.

TESTS: There will be one midterm exam, and one final exam. The final exam is NOT comprehensive. These tests will contain problems similar to those worked in class and contained in the suggested problems and exercises. Test items will be in a variety of formats, such as multiple choice, short answer, or more extended items that require explanations.
No make-up tests will be given unless the student has an official University excused absence. If you know that you will be absent, arrangements must be made in advance of the exam.

Tentative Midterm Exam Date: Monday, July 21 (Note: Check Blackboard or e-mail me to be sure the date has not changed.)
Final Exam: Thursday, August 7

COURSE EVALUATION: Each student's grade will be based on the following:
Assignments (20 points possible for each)	80 points
Midterm Exam	150 points
Final exam	150 points
Total possible	**380 points**

Grading Scale

Points earned	342-380	304-341	266-303	228-265	less than 228
Course grade	A	B	C	D	F

ACADEMIC DISHONESTY:
    All students are expected to engage in all academic pursuits in a manner that is above reproach. Students are expected to maintain complete honesty and integrity in the academic experiences both in and out of the classroom. Any student found guilty of dishonesty in any phase of academic work will be subject to disciplinary action. The University and its official representatives may initiate disciplinary proceedings against a student accused of any form of academic dishonesty including, but not limited to, cheating on an examination or other academic work which is to be submitted, plagiarism, collusion and the abuse of resource materials.

CLASSROOM RULES OF CONDUCT:
Students will refrain from behavior in the classroom that intentionally or unintentionally disrupts the learning process and, thus, impedes the mission of the university. **<u>Cellular telephones and pagers must be turned off before class begins.</u>** Students are prohibited from making offensive remarks, reading newspapers, sleeping, talking at inappropriate times, wearing inappropriate clothing, or engaging in any other form of distraction. Inappropriate behavior in the classroom shall result in a directive to leave class. Students who are especially disruptive also may be reported to the Dean of Students for disciplinary action in accordance with university policy.

FOOD AND DRINK POLICY:
Food, tobacco products, and drinks (other than water) are not allowed in the classroom.

VISITORS IN THE CLASSROOM:
Unannounced visitors to class must present a current, official SHSU identification card to be permitted in the classroom. They must not present a disruption to the class by their attendance. If the visitor is not a registered student, it is at the instructor's discretion whether or not the visitor will be allowed to remain in the classroom.

AMERICANS WITH DISABILITIES ACT:
It is the policy of Sam Houston State University that no otherwise qualified disabled individual shall, solely by reason of his/her handicap, be excluded from the participation in, be denied the benefits of, or be subjected to discrimination under any academic or Student Life program or activity. SHSU adheres to all applicable federal, state, and local laws, regulations, and guidelines with respect to providing reasonable accommodations for students with disabilities. If you have a disability that may affect adversely your work in this class, then I encourage you to register with the SHSU Counseling Center [(936) 294-1720] and to talk with me about how I can best help you. All disclosures of disabilities will be kept strictly confidential.
NOTE: No accommodation can be made until you register with the Counseling Center.

STUDENT ABSENCES ON RELIGIOUS HOLY DAYS POLICY:
Section 51.911(b) of the Texas Education Code requires that an institution of higher education excuse a student from attending classes or other required activities, including examinations, for the observance of a religious holy day, including travel for that purpose. A student whose absence is excused under this subsection may not be penalized for that absence and shall be allowed to take an examination or complete an assignment from which the student is excused within a reasonable time after the absence.
University policy 861001 provides the procedures to be followed by the student and instructor. A student desiring to absent himself/herself from a scheduled class in order to observe (a) religious holy day(s) shall present to each instructor involved a written statement concerning the religious holy day(s). The instructor will provide the student with a written description of the deadline for the completion of missed assignments.

FOUR GRADED ASSIGNMENTS:

For each of these assignments, please read the article and follow the specific directions listed below.
The assignments are worth 20 points each. NO LATE WORK WILL BE ACCEPTED.
Each assignment includes a 100-word *summary* of an article. The summary should:
- explain all of the important ideas from the article,
- make sense to someone who hasn't read the article,
- include only facts from the article, NOT your opinions.

It is difficult to summarize a four to eight page article 100 words. Because of this, **I encourage you to submit a rough draft of your work prior to the due date for feedback**.

Format guidelines
A. Your summaries and reactions must be typed and double-spaced.
B. Please include the reference for the article *exactly as it appears in the assignment description* in your summary.
C. You must use proper English grammar and spelling.
D. If you quote the author, please use quotation marks around the quote. Include the page number of the quote in parentheses.
E. Do not go over the word limit.

Assignment 1: Due at 8:00 a.m., Monday, July 15th.
Cory, B. *Introduction to the van Hiele Levels*. Unpublished article.

1. Write a 100-word *summary* of the article: *Introduction to the Van Hiele Levels*. Please use the format guidelines listed above.

2. Take the Van Hiele Geometry Test. Then grade it to determine your van Hiele level. (see Blackboard)
   Time limit for test: **35 minutes**. You will probably not complete the test, but that's okay. Just do your best!

3. Write a 150-word autobiography about your geometry experiences. (Please use format guidelines A, C, D, and E listed above.) In your autobiography, address the following three items:
   - What is your van Hiele level based on the test?
   - Describe your good experiences and/or the bad experiences with geometry. Or, if you haven't had much experience with geometry, explain why this might be the case.
   - How have these experiences or lack of experiences facilitated or impeded your progress through the van Hiele levels?

Scoring rubric for Assignment 1	
1. Adherence to format guidelines	5 points
2. Includes all main points in *summary*	6 points
3. Adequately addresses three questions in *reaction*	9 points

Assignment 2: Due at 8:00 a.m., Monday, July 21
Shifter, D., Bastable, V. & Russel S.J. (2002). Too skinny, too pointy, going the wrong way. *Examining Features of Shape*, 77 - 81.
Shifter, D., Bastable, V. & Russel S.J. (2002). Three sides, three corners. *Examining Features of Shape*, 82 - 87.

1. Write a 100-word *summary* of the articles. (One summary only.) Please use the format guidelines listed above.

2. Follow the thinking of Susannah throughout the second article, *Three sides, three corners*. Write a 150-word response to the following questions about her thinking. (Please use format guidelines A, C, D, and E listed above.)
   - At what van Hiele Level is Susannah?
   - What does Susannah understand about triangles at the beginning of the class discussion?
   - What does Susannah not understand about triangles at the beginning of the class discussion?
   - What does she figure out by the end of class?

Scoring rubric for Assignment 2	
1. Adherence to format guidelines	5 points
2. Includes all main points in *summary*	6 points
3. Correct answers to questions about Susannah	9 points

Assignment 3: Due at 8:00 a.m., Monday, July 28

Burger, E.B. & Starbird, M. "Chaos and Fractals." *The Heart of Mathematics*. Emeryville, CA: Key College Publishing, pp. 400 – 407, 428 – 434.

1. Write a 100-word summary of the portions of the article provided. Please use the <u>format guidelines</u> listed on the previous page.

2. Complete the following activities:
   - Draw stage 2, stage 3, and stage 4 of the Sierpinski Triangle using the dot paper provided on Blackboard.
   - Read the short web page about Self Similarity at <u>http://math.rice.edu/~lanius/fractals/self.html</u>
     Then answer questions 1, 2, and 3 at the bottom of this web page.
       Expectations:
       ➢ Within questions 2 and 3, there are a few sub-questions. Rewrite each sub-question before answering it.
       ➢ On questions 2 and 3, you must include diagrams to support your answers.
       ➢ I expect you to download triangle paper at <u>http://math.rice.edu/~lanius/images/triangle.gif</u> to draw the hexagons in question 2.

Scoring rubric for Assignment 3	
1. Adherence to <u>format guidelines</u>	5 points
2. Includes all main points in *summary*	6 points
3. Correct answers for activities with neat, correct drawings.	9 points
Rewrites each sub-question before answering it.	
Dot paper or triangle paper is used as appropriate.	

Assignment 4: Due at 8:00 a.m., Monday, August 4

Harrell, M.E. & Fosnaugh, L.S. (1997). Allium to zircon: Mathematics. *Mathematics Teaching in the Middle School, 2*(6), 380 - 289.

1. Write a 100-word *summary* of the article. Please use the <u>format guidelines</u> listed on the previous page.

2. Write a 150-word *reaction* to the article. Please use <u>format guidelines A, C, D, and E</u> listed on the previous page. In the reaction, please answer the following questions:
   - Describe two things you learned from this article.
   - What was the most surprising thing you read in this article?
   - Because of reading this article, what questions do you have? (Please list at least two.)

Scoring rubric for Assignment 4	
1. Adherence to <u>format guidelines</u>	5 points
2. Includes all main points in *summary*	6 points
3. Adequately addresses three questions in *reaction*	9 points