Math 1384-02 Course Syllabus
Foundations of Mathematics for Elementary Teachers (I)
Fall 2017

Classroom and Schedule: Monday and Wednesday, 9:30-10:50am; Room 431, Lee Drain Building

INSTRUCTOR: Dr. Emma Bullock
Office: 439G
Phone: (936) 294-3816
Email: ebullock@shsu.com
FAX: (936) 294-1182
Office Hours: M, W 11:00am-1:0pm
T, R 12:30-1:30pm

Course Description: This course is the first 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, sets, numeration systems, natural numbers, integers, number theory and rational numbers. 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. Prerequisites: TSI score of 350 or grade of C or better in Math 0332. 3 semester hours

COURSE OBJECTIVES: (from TEKS – Educator Standards)

Upon completion of this course, students will be able to meet the following competencies as outlined by the state of Texas.

Competency 002 (Number Concepts and Operations): The teacher understands concepts related to numbers, operations and algorithms and the properties of numbers.

The beginning teacher:

A. Analyzes, creates, describes, compares and models relationships between number properties, operations and algorithms for the four basic operations involving integers, rational numbers and real numbers, including real-world situations.

B. Demonstrates an understanding of equivalency among different representations of rational numbers and between mathematical expressions.

C. Selects appropriate representations of real numbers (e.g., fractions, decimals, percents) for particular situations.

D. Demonstrates an understanding of ideas from number theory (e.g., prime factorization, greatest common divisor, divisibility rules) as they apply to whole numbers, integers and rational numbers, and uses those ideas in problem situations.

E. Understands the relative magnitude of whole numbers, integers, rational numbers and real numbers including the use of comparative language and sets of objects.

F. Identifies and demonstrates an understanding of and uses of a variety of models and objects for representing numbers (e.g., fraction strips, diagrams, patterns, shaded regions, number lines).

G. Uses a variety of concrete and visual representations to demonstrate the connections between operations and algorithms.

H. Identifies, demonstrates and applies knowledge of counting techniques, including combinations, to quantify situations and solve math problems (e.g., to include forward, backward and skip counting, with or without models).

I. Identifies, represents and applies knowledge of place value (e.g., to compose and decompose numbers), rounding and other number properties to perform mental mathematics and computational estimation with automaticity.

J. Demonstrates a thorough understanding of fractions, including the use of various representations to teach fractions and operations involving fractions.

K. Uses a variety of strategies to generate and solve problems that involve one or more steps, with fluency.

Competency 006 (Mathematical Processes): The teacher understands mathematical processes and knows how to reason mathematically, solve mathematical problems and make mathematical connections within and outside of mathematics.

The beginning teacher:

A. Understands the role of logical reasoning in mathematics and uses formal and informal reasoning to explore, investigate and justify mathematical ideas.

B. Applies correct mathematical reasoning to derive valid conclusions from a set of premises.

C. Applies principles of inductive reasoning to make conjectures and uses deductive methods to evaluate the validity of conjectures.

D. Evaluates the reasonableness of a solution to a given problem. Understands connections among concepts, procedures and equivalent representations in areas of mathematics (e.g., algebra, geometry).

F. Recognizes that a mathematical problem can be solved in a variety of ways and selects an appropriate strategy for a given problem.

G. Expresses mathematical statements using developmentally appropriate language, standard English, mathematical language and symbolic mathematics.

H. Communicates mathematical ideas using a variety of representations (e.g., numeric, verbal, graphic, pictorial, symbolic, concrete).

I. Demonstrates an understanding of the use of visual media such as graphs, tables, diagrams and animations to communicate mathematical information.

J. Demonstrates an understanding of estimation, including the use of compatible numbers, and evaluates its appropriate uses.

K. Knows how to use mathematical manipulatives and a wide range of appropriate technological tools to develop and explore mathematical concepts and ideas.

L. Demonstrates knowledge of the history and evolution of mathematical concepts, procedures and ideas.

M. Recognizes the contributions that different cultures have made to the field of mathematics and the impact of mathematics on society and cultures.

N. Demonstrates an understanding of financial literacy concepts and their application as these relate to teaching students (e.g., describes the basic purpose of financial institutions; distinguishes the difference between gross and net income; identifies various savings options; defines different types of taxes; identifies the advantages and disadvantages of different methods of payments, savings and credit uses and responsibilities).

O. Applies mathematics to model and solve problems to manage financial resources effectively for lifetime financial security, as it relates to teaching students (e.g., distinguishes between fixed and variable expenses, calculates profit in a given situation, develops a system for keeping and using financial records, describes actions that might be taken to develop and balance a budget when expenses exceed income).

Texas Educator Standards for Mathematics (standards particularly addressed in this course)**

**Mathematics Standard I

Number Concepts: The mathematics teacher understands and uses numbers, number systems and their structure, operations and algorithms, quantitative reasoning and technology appropriate to teach the statewide curriculum (Texas Essential Knowledge and Skills [TEKS]) in order to prepare students to use mathematics.

**Mathematics Standard V

Mathematical Processes: The mathematics teacher understands and uses mathematical processes to reason mathematically, to solve mathematical problems, to make mathematical connections within and outside of mathematics and to communicate mathematically.

**Mathematics Standard VI

Mathematical Perspectives: The mathematics teacher understands the historical development of mathematical ideas, the interrelationship between society and mathematics, the structure of mathematics and the evolving nature of mathematics and mathematical knowledge.

**Mathematics Standard VII

Mathematical Learning and Instruction: The mathematics teacher understands how children learn and develop mathematical skills, procedures and concepts; knows typical errors students make; and uses this knowledge to plan,

organize and implement instruction; to meet curriculum goals; and to teach all students to understand and use mathematics.

**Mathematics Standard IX

Professional Development: The mathematics teacher understands mathematics teaching as a profession, knows the value and rewards of being a reflective practitioner and realizes the importance of making a lifelong commitment to professional growth and development.

Required Textbook:

Reconceptualizing Mathematics for Elementary School Teachers. (Third Edition). Sowder, J., Sowder, L. and Nickerson, S. (2017). New York, NY: W.H. Freeman and Company.

This text is intended to be a consumable resource for students. You are encouraged to write in your text (space is provided in the margins of the text) and to keep your notes and work for use in future methods courses, as well as classroom teaching. The pages of the text are perforated and may be easily removed. Supplemental materials will be provided by the instructor.

Supplies: Bring the following supplies to each class meeting.

- Colored pencils, crayons, or markers
- A scientific or graphing calculator

Course Evaluation: Each student's grade will be based on

3 Unit Tests (each 100 points)	300
Arithmetic Test	50
Folder Checks (each 5 points—best 10 of 12)	50
Online Quizzes (each 10 points—best 5 of 7)	50
Final Exam (Comprehensive)	150
Total Points	600

Grading Scale

A	540-600
B	480-539
C	420-479
D	360-419
F	359 and below

ARITHMETIC TEST: A ten-question test will be administered in class during the first week of class. This test will cover addition, subtraction, multiplication, and division of whole numbers, fractions, and decimals. Calculators are NOT allowed on the arithmetic test.

Scoring: The table below shows how the Arithmetic Test will be scored.

Number correct	10	9	8	7	6	5	4	3	2	1	0
Score	50	25	13	7	6	5	4	3	2	1	0

Re-takes: Students with a score below 50 may take a similar version of the test. Students must contact the instructor to schedule a time for the re-take, which will occur outside of class time. Students may re-take the test up to three times. All re-takes must occur on or before October 5th, 2017. After October 5th, your score on the arithmetic test is final.

FOLDER CHECKS: One of the indicators of the understanding of a concept is the ability "to state it in your own words". Communicating your understanding will be shown through your complete solutions to assigned homework problems and through homework, written responses/reflections to readings, questions, situations, activities or other topics related to your study of mathematics. These responses will be collected **at least** 12 times over the course of the semester and be **worth 5 points** each. 2.5 points will result from the 1 random homework/class-work, etc. question that I grade and the other 2.5 points come from overall completeness, thought, and effort displayed in your work. After each folder check, complete answers to the homework assignments will be given to the entire class to

help you evaluate the correctness of your thinking as the semester progresses and to help you prepare for quizzes and tests. Your **best 10 of 12** will be counted toward your final point total. Folder checks will include in-class work as well as out-of-class assignments. Because you will drop your lowest 2 scores, **NO LATE WORK WILL BE ACCEPTED.**

ONLINE QUIZZES: As an additional check on completion of HW assignments, assigned textbook readings, and other learning assignments given, there will be 7 online quizzes posted on Blackboard for your completion. Each quiz will have between 5 and 10 questions for response and be **worth 10 points**. You will have several days to access the quiz and complete your answers and submit them for grading. Once the deadline for response is past, no further access is available for that quiz. Further details will be shared at the time of the first quiz being posted. Your **best 5 of 7** quiz scores will be counted toward your final point total. Because, you will drop your lowest 2 scores, **NO LATE QUIZZES WILL BE ACCEPTED.**

CLASS PARTICIPATION AND 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.** If you have **3 or fewer** absences, your final exam percentage grade can be substituted for your lowest unit test grade in figuring your final course grade. **Note:** Some folder check grades will come from in-class work - if you are absent, you lose that opportunity.

TESTS: Tests will include problems that are similar to problems assigned and worked in class. A portion of each test will include multiple choice or short answer problems. Other portions of each test will include problems where students must show all of their work correctly, as well as arrive at the correct solution to the problem, or provide complete explanations for the problem or situation posed.

Test Dates: September 28, October 26, November 28
MISSED TEST POLICY: If you are unable to take a test due to an Official University excused absence, arrangements for taking the test must be made in advance of the scheduled test date. If you miss a test due to an unforeseeable emergency situation, contact Dr. Bullock as soon as possible but must be prior to the next class meeting for any possibility of taking a makeup test. If you miss a test and a makeup test is not possible, your final exam percentage grade will be used as a replacement.

Final Exam Date: Wednesday – December 6 – from 9:30-11:30am

Course Schedule (I always reserve the right to take away from the schedule if I deem it necessary.)

Class Date	Concepts	Homework	Assignments DUE
W 8/23	Introduction/Getting Started	Read: 2.5 Issues for Learning—Understanding Place Value pp.43-44 HW1	
W 9/6	2.2 Place Value	HW2 (2.2: 2, 5, 6, 8, 9)	Arithmetic Test (HW1
M 9/11	2.3 Bases Other Than Ten	HW3 (2.3: 5, 7, 13, 16, 25)	Folder Check #1 (HW2)
W 9/13	2.4 Operations in Different Bases	Read: 3.6 Issues for Learning—Developing Number Sense pp.76-77 Online Quiz 1 (Ch. 2) HW4 (2.4: 1, 3, 4, 5, 10)	Folder Check #2 (HW3)

M 9/18	3.1 Ways of Thinking About Addition and Subtraction/3.2 Children's Ways of Adding and Subtracting	HW5 (3.1: 1, 3, 5, 7, 9; 3.2: 1-8)	Online Quiz 1 (Ch.2) (HW4)
W 9/20	3.3 Ways of Thinking About Multiplication	HW6 (3.3: 2, 3, 4, 14, 23)	Folder Check #3 (HW5)
M 9/25	3.4 Ways of Thinking About Division	HW7 (3.4: 1, 2, 4, 9, 10)	Folder Check #4 (HW6)
W 9/27	3.5 Children Find Products and Quotients	Read: 4.2 Issues for Learning—The Role of Algorithms pp.91-92 Online Quiz 2 (Ch.3) HW8 (3.5: 1-6)	Folder Check #5 (HW7)
M 10/2	4.1 Operating on Whole Numbers and Decimal Numbers	Online Quiz 3 (Ch. 4) HW9 (4.1: 1-7, 11-13)	Online Quiz 2 (Ch. 3) (HW8)
W 10/4	Test #1: Place Value and Operations	Read: 6.5 Issues for Learning—Understanding Fractions and Decimals pp. 135-136	Folder Check #6 Online Quiz 3 (Ch. 4) (HW9)
M 10/9	6.1 Understanding the Meanings of a/b/6.2 Comparing Fractions	HW10 (6.1: 3, 4, 8, 11, 13, 14, 15, 18, 19, 21; 6.2: 3-6, 8-10, 12)	
W 10/11	6.3 Equivalent (Equal) Fractions	HW11 (6.3: 6, 10-14)	Folder Check #7 (HW10)
M 10/16	6.4 Relating Fractions, Decimals, and Percents	Read: 7.4 Issues for Learning—Teaching Calculation with Fractions Online Quiz 4 (Ch. 6) HW12 (6.4: 1-5, 9, 12-14, 16, 18)	Folder Check #8 (HW11)
W 10/18	7.1 Adding and Subtracting Fractions	HW13 (7.1: 1-3, 14-16, 18)	Online Quiz 4 (Ch. 6) (HW12)
M 10/23	7.2 Multiplying by a Fraction	HW14 (7.2: 1-21)	(HW13)
W 10/25	7.3 Dividing by a Fraction	Online Quiz 5 (Ch. 7) HW15 (7.3: 1-3, 5-9, 13-15)	Folder Check #9 (HW14)
M 10/30	Test #2 Fractions	Read: 10.7 Issues for Learning—A Historical Perspective	Online Quiz 5 (Ch. 7) (HW15)
W 11/1	10.1 Big Ideas About Signed Numbers/10.6 Number Systems	HW16 (10.1: 1, 2, 5, 6; 10.6: 2-4, 10, 11)	
M 11/6	10.2 Children's Ways of Reasoning About Signed Numbers/10.3 Other Models for Signed Numbers	HW17 (10.2: 1-4; 10.3: 1-5)	Folder Check #10 (HW16)
W 11/8	10.4 Operations With Signed Numbers/10.5 Multiplying and Dividing Signed Numbers	Read: 11.5 Issues for Learning—Understanding the Unique Factorization Theorem Online Quiz 6 (Ch. 10) HW18 (10.4: 1, 2, 4, 6, 7, 10; 10.5: 1-3, 5, 7-9)	(HW17)
M 11/13	11.1 Factors and Multiples, Primes and Composites	HW19 (11.1: 2, 5, 9-12, 15, 20)	Folder Check #11 Online Quiz 6 (Ch. 10) (HW18)

W 11/15	11.2 Prime Factorization/11.3 Divisibility Tests to Determine Whether a Number is Prime	HW20 (11.2: 5, 6, 11, 12, 15; 11.3: 4, 10, 11, 13, 16, 17)	(HW19)
M 11/20	11.4 Greatest Common Factor, Least Common Multiple	Online Quiz 7 (Ch. 11) HW21 (11.4: 4-6, 12, 18, 21, 23, 24, 29)	(HW20)
M 11/27	Test #3 Expanded Number System and Number Theory		Folder Check #12 Online Quiz 7 (Ch.11) (HW21)
W 11/29	Review for Final		
W 12/6	Final Exam 9:30-11:30am		

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. Cellular telephones and pagers must be turned off before class begins. Students are prohibited from eating in class, using tobacco products, 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.

Use of Telephones and Text Messagers in Academic Classrooms and Facilities: The use by students of electronic devices that perform the function of a telephone or text messager during class-time may be prohibited if deemed disruptive by the instructor to the conduct of the class. Arrangements for handling potential emergency situations may be granted at the discretion of the instructor. Failure to comply with the instructor's policy could result in expulsion from the classroom or with multiple offenses, failure of the course. Any use of a telephone or text messager or any device that performs these functions during a test period is prohibited. These devices should not be present during a test or should be stored securely in such a way that they cannot be seen or used by the student. Even the visible presence of such a device during the test period will result in a zero for that test. Use of these devices during a test is considered de facto evidence of cheating and could result in a charge of academic dishonesty (see student code of conduct http://www.shsu.edu/students/guide/StudentGuidelines2010-2012.pdf#page=29).

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.

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 and/or tests.

STUDENTS WITH DISABILITIES POLICY:

It is the policy of Sam Houston State University that individuals otherwise qualified shall not be excluded, solely by reason of their disability, from participation in any academic program of the university. Further, they shall not be denied the benefits of these programs nor shall they be subjected to discrimination. Students with disabilities that might affect their academic performance should register with the Office of Services for Students with Disabilities located in the Lee Drain Annex (telephone 936-294-3512, TDD 936-294-3786, and e-mail disability@shsu.edu). They should then make arrangements with their individual instructors so that appropriate strategies can be considered and helpful procedures can be developed to ensure that participation and achievement opportunities are not impaired.

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 Services for Students with Disabilities 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 Services for Students with Disabilities. For a complete listing of the university policy, see:
http://www.shsu.edu/dept/academic-affairs/documents/aps/students/811006.pdf

ACADEMIC DISHONESTY POLICY

1. GENERAL

The subject of academic honesty is addressed in paragraph 5.3, Chapter VI, of the Rules and Regulations, Board of Regents, The Texas State University System, and Sam Houston State University Student Guidelines published by the Office of Student Life.

5.3 Academic Honesty. The University expects all students 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.

5.31 The University and its official representatives, acting in accordance with Subsection 5.32 may initiate disciplinary proceedings against a student accused of any form of academic dishonesty including, but not limited to, cheating, plagiarism, collusion, and the abuse of resource materials.

"**Cheating**" includes the following and similar actions:

(1) Copying from another student's test paper, laboratory report, other report, or computer files, data listings, and/or programs.

(2) Using, during a test, materials not authorized by the person giving the test.

(3) Collaborating, without authorization, with another student during an examination or in preparing academic work.

(4) Knowingly, and without authorization, using, buying, selling, stealing, transporting, soliciting, copying, or possessing, in whole or in part, the contents of an unadministered test.

(5) Substituting for another student, permitting any other person, or otherwise assisting any other person to substitute for oneself or for another student in the taking of an examination or test or the preparation of academic work to be submitted for academic credit.

(6) Bribing another person to obtain an unadministered test or information about an unadministered test.

(7) Purchasing, or otherwise acquiring and submitting as one's own work any research paper or other writing assignment prepared by an individual or firm. This section does not apply to the typing of the rough and/or final versions of an assignment by a professional typist.

5.32 "Plagiarism" means the appropriation and the unacknowledged incorporation of another's work or idea into one's own work offered for credit.

5.33 "Collusion" means the unauthorized collaboration with another person in preparing work offered for credit.

5.34 "Abuse of resource materials" means the mutilation, destruction, concealment, theft or alteration of materials provided to assist students in the mastery of course materials.

5.35 “Academic work” means the preparation of an essay, dissertation, thesis, report, problem, assignment, or other project that the student submits as a course requirement or for a grade.

2. PROCEDURES IN CASES OF ALLEGED ACADEMIC DISHONESTY

2.01 Procedures for discipline due to academic dishonesty shall be the same as in disciplinary actions specified in The Texas State University System Rules and Regulations and Sam Houston State University Student Guidelines except that all academic dishonesty actions shall be first considered and reviewed by the faculty member teaching the class. The faculty member may impose failure or reduction of a grade in a test or the course, and/or performing additional academic work not required of other students in the course. If the faculty member believes that additional disciplinary action is necessary, as in the case of flagrant or repeated violations, the case may be referred to the Dean of Student Life or a designated appointee for further action. If the student involved does not accept the decision of the faculty member, the student may appeal to the chair of the appropriate academic department/school, seeking reversal of the faculty member's decision.

2.02 If the student does not accept the decision of the chair of the academic department/school, he/she may appeal to the appropriate academic dean. The chair of the academic department/school may also refer the case directly to the academic dean if the case so warrants.