

MATH 2008-04

Foundations of Numbers and Operations

Instructor: Dr. Kyunghee Moon

Contact Information:

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Office hours: 9:30-11:00 & 1:00-2:00 (T & Th) at Carrollton campus

Textbook: *A Problem solving approach to mathematics for elementary school teachers*, 12th Edition. Pearson Addison-Wesley: Boston, MA. (by Billstein, R., Libeskind, S., & Lott, J., 2015).

Electronics: No electronics are allowed in this course, including calculators.

Goals and Objectives of the Course include, but not limited to,

- Apply and adapt a variety of appropriate strategies to solve problems.
- Identify how a sequence (in both numeric forms and in diagrams) grows and find the general term of sequence using the pattern in the sequence. Explain how Gauss method works and generalize the method to find the sum of terms in a sequence with a pattern.
- Explain how sets and whole numbers are connected.
- Explain and be able to use quantifiers in mathematical statements and conditional statements and their implication statements.
- Construct numeric systems for various bases and explain the role of place values and zero in the systems. Be able to convert back and forth numbers in base 10 to numbers in base other than 10.
- Identify and explain various strategies and algorithms for number operations (addition, subtraction, multiplication, and division) and use those in calculation.
- Be able to model operations using various representations (visual and verbal) and explain how multiple representations are connected.
- Explain how mathematical properties, such as the distributive, commutative, and associative properties, are embedded in various strategies in operations and use the properties efficiently in problem solving.
- Define and find multiples and factors including the greatest common divisor (GCD) and the least common multiple (LCM). Be able to explain how prime factorizations of numbers are associated with the GCD and LCM.

- State the divisibility rules and explain why those rules work. Apply the rules to determine if numbers are divisible by certain numbers and to list numbers that satisfy the rules.
- Explain and compute integer operations using various models.

Attendance and Classroom Rules:

- Students must be **punctual** and **always** attend class. There could be unforeseen emergencies that do come up. However, anyone missing classes **FIVE times or more** during the semester will not receive a credit for the course. Medical excuses are accepted only with documentation.
- Attendance will be checked at the start of each class. Students are responsible for reporting their attendance to the instructor once attendance has been called. The first two tardiness combined will be considered as one absence. After two tardiness, each tardiness will be considered as one absence. Students who disrupt the class for any reason will be escorted to outside of the classroom, disallowed to return for the day, and marked absent.

Use of Electronics: Students cannot use any electrical device in the classroom, including calculators. Students who do not abide by this rule will be escorted to outside of the classroom, disallowed to return for the day, and marked absent.

Grading: The final grade in the course will be based on the performance on homework assignments (10 Points), Writing assignments (5), three mid-term exams (20 points each) and a final exam (25 points), totaling 100 points.

- Homework will be assigned regularly and collected one class day prior to each midterm exam. Homework grades will be based on the organization (numbers should be in order), completeness, and correctness. Homework must include all the necessary work leading to the answer. Late homework won't be accepted.

Homework Grading Rubric

3 Points: More than 75% correctness and completeness

2 Points: More than 50% correctness and completeness

1 Point: More than 25% correctness and completeness

0 Point: Less than 25% correctness and completeness

- There will be one or two reading and writing assignments during the course. The details will be announced later.
- **NO** make-up exam will be allowed in any case. For midterm exams, if a student misses an exam due to her/his own medical emergency that can be documented, the student's midterm score will be determined by her/his score on the final exam related to the midterm materials.

- If a student misses the final exam, the final exam score will be 0, with no exception.

Grade Components and Dates

Homework:	10%	
Writing	5%	
Midterm 1	20%	Sep. 13 th
Midterm 2	20%	Oct. 25 th
Midterm 3	20%	Nov. 29 th
Final Exam	25%	Dec. 11 th (2:00-4:00pm)

Final Course Grade

A	90-100
B	80-89
C	70-79
D	60-69
F	Below 60

Common Language Link: For school policies and supports, check the link below:
<https://www.westga.edu/administration/vpaa/common-language-course-syllabi.php>.

Conferences: Students are encouraged to seek additional help in case they have difficulties understanding materials. Students may drop by the instructor's office during office hours or get help from the Math Tutoring Center (located on the second floor of Boyd Building). Students may also communicate with the instructor through emails.

Academic Dishonesty: Any instance of academic dishonesty will result in a failing grade for this course and may result in additional disciplinary action.

Tentative Schedule

Week	Topics	Materials
1	<ul style="list-style-type: none"> • Patterns • Problem Solving using Patterns 	Textbook-Ch. 1.1 & 1.2
2 & 3	<ul style="list-style-type: none"> • Sets, Set Operations and Properties 	Textbook-Ch. 2.1, 2.2, & 2.3
4, 5 & 6	<ul style="list-style-type: none"> • Numbers with Various Bases • Properties of Whole Numbers • Addition and Subtraction with Whole Numbers and Numbers in Various Bases 	Textbook-Ch. 3.1, 3.2 & 3.4
7 & 8	<ul style="list-style-type: none"> • Multiplication and Division with Whole Numbers • Properties of Exponents 	Textbook-Ch. 3.3 & 3.5
9, 10 & 11	<ul style="list-style-type: none"> • Divisibility • Prime and Composite Numbers 	Textbook-Ch. 4.1, 4.2 & 4.3

	<ul style="list-style-type: none"> • GCD and LCM 	
12	<ul style="list-style-type: none"> • Integers and Operations with Integers 	Textbook-Ch. 5.1 & 5.2
13 & 14	<ul style="list-style-type: none"> • Rational Numbers and Operations • Proportional Reasoning 	Textbook-Ch. 6.1, 6.2, 6.3 & 6.4
15	<ul style="list-style-type: none"> • Review 	
16	<ul style="list-style-type: none"> • Final Exam 	