MATH 2008-04

Foundations of Numbers and Operations

Instructor: Kyunghee Moon, Ph. D.

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Office hours: 12:15-2:00 (T & Th)

3:15-4:45 (T)

Textbook:

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

Calculator: No Calculator

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

1. Apply and adapt a variety of appropriate strategies to solve problems.
2. 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.
3. 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.
4. Identify and explain various strategies and algorithms for number operations (addition, subtraction, multiplication, and division) and use those in calculation.
5. Be able to model operations using various representations (visual and verbal) and explain how multiple representations are connected.

6. 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.
7. 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.
8. 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.
9. 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 **FOUR times or more** during the semester **might not** receive a credit for the course. Medical excuses are only accepted when provided with documentation.
- Students cannot enter the classroom once the class starts and should wait **SILENTLY** outside of the classroom until the door is reopen. In such cases, students will be recorded as tardy. The first two tardiness combined will be considered as one absence. After two tardiness, each tardiness will be considered as one absence. Students are responsible for reporting their attendance to the professor once the attendance roll is called.
- 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), 3 mid-term exams (20 points each) and a final exam (30 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 4 midterm tests and the lowest midterm score will be dropped. **NO** make-up exam will be provided in any case, **including medical emergencies**.
- If students miss the final exam, the final exam score will be 0, with no exception.

Grade Components and Dates			**Final Course Grade**	
Homework:	10%		A	90-100
Midterm 1	20%*	August 31st	B	80-89.99
Midterm 2	20%*	Sep. 26th	C	70-79.99
Midterm 3	20%*	Oct. 24th	D	60-69.99
Midterm 4	20%*	Nov. 14th	F	Below 60
Final Exam	30%	Dec. 5th (2-4pm)		

* The lowest midterm will be dropped.

Common Language Link:
https://www.westga.edu/administration/vpaa/assets/docs/faculty-resources/common_language_for_course_syllabi_v2.pdf

Tentative Schedule

Week	Topics	Materials
1 & 2	• Problem Solving • Patterns and Sequences	Textbook-Ch. 1.1 & 1.2
3, 4, & 5	• Numbers with Various Bases • Properties of Whole Numbers • Addition and Subtraction with Whole Numbers • Multiplication and Division with Whole Numbers • Addition, Subtraction Algorithms Multiplication and Division Algorithms	Textbook-Ch. 3.1, 3.2, 3.3, 3.4, & 3.5
6 & 7	• Divisibility • Prime and Composite Numbers • GCD and LCM	Textbook-Ch. 4.1, 4.2 & 4.3
8 & 9	• Integers and Operations with Integers • Absolute Value	Textbook-Ch. 5.1 & 5.2
10 & 11	• Rational Numbers and Operations • Proportional Reasoning	Textbook-Ch. 6.1, 6.2, 6.3 & 6.4
12, 13, & 14	• Rational Numbers as Decimals and Percents	Textbook-Ch. 7.1, 7.2, 7.3 & 7.4
15 (Week after Thanksgiving Break)	• Review	
16	• Final Exam	