Course Syllabus

MATH 1350-Mathematics for Teachers I

Catalog Description: This course is intended to build or reinforce a foundation in fundamental mathematics concepts and skills. It includes the conceptual development of the following: sets, functions, numeration systems, number theory, and properties of the various number systems with an emphasis on problem solving and critical thinking.

Prerequisites: Math 1314 or equivalent

Semester Credit Hours: 3
Lecture Hours per Week: 3
Lab Hours per Week: 0
Extended Hours:1
Contact Hours per Semester: 64
State Approval Code: 27.0101.56 19

Class section meeting time:

Alternate Operations During Campus Closure: In the event of an emergency or announced campus closure due to a natural disaster or pandemic, it may be necessary for Panola College to move to altered operations. During this time, Panola College may opt to continue delivery of instruction through methods that include, but are not limited to: online learning management system (CANVAS), online conferencing, email messaging, and/or an alternate schedule. It is the responsibility of the student to monitor Panola College's website (www.panola.edu) for instructions about continuing courses remotely, CANVAS for each class for course-specific communication, and Panola College email for important general information.

Core Components and Related College Student Learning Outcomes
This course counts as part of the academic requirements of the Panola College Core Curriculum and an Associate of Arts or Associate of Science degree. ☐ Yes ☐No: If no, skip to Instructional Goals.

The items below marked with an X reflect the state-mandated outcomes for this course **IF this is a CORE course**:

☒ Critical Thinking Skills – to include creative thinking, innovation, inquiry and analysis, evaluation and syntheses of information

☐ CT1: Generate and communicate ideas by combining, changing, or reapplying existing information

☒ CT2: Gather and assess information relevant to a question

☒ CT3: Analyze, evaluate, and synthesize information

☒ Communication Skills – to include effective development, interpretation, and expression of ideas through written, oral, and visual communication

☒ CS1: Develop, interpret, and express ideas through written communication

☐ CS2: Develop, interpret, and express ideas through oral communication

☐ CS3: Develop, interpret, and express ideas through visual communication

☒ Empirical and Quantitative Skills – to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions

☒ EQS1: Manipulate and analyze numerical data and arrive at an informed conclusion

☒ EQS2: Manipulate and analyze observable facts and arrive at an informed conclusion

☐ Teamwork – to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal

☐ TW1: Integrate different viewpoints as a member of a team

☐ TW2: Work with others to support and accomplish a shared goal

☐ Personal Responsibility – to include the ability to connect choices, actions, and consequences to ethical decision-making

☐ PR1: Evaluate choices and actions and relate consequences to decision-making

☐ Social Responsibility – to include intercultural competence, knowledge of civic responsibility, and the ability to engage effectively in regional, national, and global communities

☐ SR1: Demonstrate intercultural competence

☐ SR2: Identify civic responsibility

☐ SR3: Engage in regional, national, and global communities

Instructional Goals and Purposes:
The purpose of this course is to demonstrate:

1. Competence in problem solving.
2. Competence in logic and sets.
3. Competence in number systems and whole number operations.
4. Competence in number theory.
5. Competence in solving problems using the properties of the integers and ordering the integers.
6. Competence in solving problems using the properties of the rational numbers.
7. Competence in solving problems using the properties of the real numbers.
8. Competence in the use of algebraic thinking.

Learning Outcomes: [*from the ACGM catalog]*
After studying all materials and resources presented in the course, the student will be able to:

1. Explain and model the arithmetic operations for whole numbers and integers.
2. Explain and model computations with fractions, decimals, ratios, and percentages.
3. Describe and demonstrate how factors, multiples, and prime numbers are used to solve problems.
4. Apply problem solving skills to numerical applications.
5. Represent and describe relationships among sets using the appropriate mathematical terminology and notation.

6. Compare and contrast structures of numeration systems

Course Content:

A general description of lecture/discussion topics included in this course are listed in the Learning Objectives / Specific Course Objectives sections of this syllabus.

Students in all sections of this course will learn the following content:

1. The four-step problem solving process
2. How to solve problems using various problem-solving strategies
3. Find patterns and determining if the pattern holds
4. Deductive and inductive reasoning and when to use them
5. Different types of sequences, such as arithmetic, geometric, and Fibonacci
6. Quantifiers and their effects on statements
7. Different forms of statements
8. How to determine whether two statements are logically equivalent
9. How to develop logical arguments
10. How to determine whether an argument is valid
11. Set language and structure as applied to elementary mathematics
12. Connections between finite sets and whole numbers
13. Uses of one-to-one correspondence
14. Relations between set operations and logic connectives
15. Venn Diagrams to sort and reason with data
16. Numbers, their origin, and their representation in numerals and models
17. Different numeration systems including the hindu-Arabic numeral system
18. Place value and counting in base ten and other bases
19. Operations in the whole number system
20. Divisibility, factors, and multiples
21. Divisibility tests for 2,3,4,5,6,8,9,10, and 11
22. Prime and composite numbers
23. The Fundamental Theorem of Arithmetic
24. The number of divisors of any natural number

25. Determining whether a number is prime
26. Finding and applying the greatest common divisor and least common multiple of two or more numbers
27. The meaning of integers and their placement on a number line
28. Operations in the set of integers
29. Models for addition, subtraction, multiplication and division of integers
30. Different representations for rational numbers
31. Operations in the set of rational numbers
32. Models for addition, subtraction, multiplication and division of rational numbers
33. Ratios and their relation to rational numbers
34. Proportions and their properties
35. Decimal notation, terminating decimals, repeating decimals
36. Connections between fractions, decimals, and percents
37. Operations on decimal numbers
38. Operations and the set of real numbers
39. Radicals and rational exponents
40. Variables to translate word phrases into algebraic expressions
41. Solving equations and word problems
42. The formulas for the nth term of arithmetic and geometric sequences
43. Properties of equality and equations and finding solutions
44. The concepts of a function
45. Different representations of a function
46. Equations of lines
47. The slope of a line
48. Graphic and algebraic solutions for systems of linear equations
49. Solutions to systems of linear equations.

Extended Hours:

Additional content in relation to state based assessments, Grade K-8 core standards, and other

mathematics education related applications.

Methods of Instruction/Course Format/Delivery:

Methods of Instruction/Course Format/Delivery: Methods employed will include Lecture/demonstration, discussion, problem solving, analysis, and reading assignments. Homework will be assigned. Faculty may choose from, but are not limited to, the following methods of instruction:

1. Lecture
2. Discussion
3. Internet
4. Video
5. Television
6. Demonstrations
7. Field trips
8. Collaboration
9. Readings

Major Assignments/Assessment:

Faculty may assign both in- and out-of-class activities to evaluate students' knowledge and abilities. Faculty may choose from, but are not limited to, the following methods: attendance, class preparedness, participation, collaborative learning projects, exams/tests/quizzes, homework, internet, library assignments, readings, research papers, scientific observations, student-teacher conferences, and written assignments.

The Mathematics Department does not accept late work.

Assessment(s):

1. Exam per Chapter
2. Project/Report
3. Comprehensive Final Exam

Course Grade:

Assignment Weights	
Class Participation	10%
Homework/Quiz Average	15%
Exams	55%
Comprehensive Final Exam	20%

Letter Grades for the Course will be assigned as follows:

A: 90 < Average < 100

B: 80 < Average < 90

C: 70 < Average < 80

D: 60 < Average < 70

F: 00 < Average < 60

Texts, Materials, and Supplies:

- Required---MyLab and Mastering Access ISBN 9780135190050
- The eText for "A Problem Solving Approach to Mathematics for Elementary School Teachers" 13th edition is available with the MyLab and Mastering access. No textbook purchase is necessary.
- Canvas Access

Other:

- Courses conducted via video conferencing may be recorded and shared for instructional purposes by the instructor.
- For current texts and materials, use the following link to access bookstore listings: http://www.panolacollegestore.com
- For testing services, use the following link: http://www.panola.edu/elearning/testing.html
- If any student in this class has special classroom or testing needs because of a physical learning or emotional condition, please contact the ADA Student Coordinator in Support Services located in the Administration Building or go to http://www.panola.edu/student-success/disability-support-services/ for more information.
- Withdrawing from a course is the student's responsibility. Students who do not attend class and who do not withdraw will receive the grade earned for the course.
- Student Handbook, *The Pathfinder:* http://www.panola.edu/student-success/documents/pathfinder.pdf