



MATH 1350 - Mathematics for Teachers I 401 Course Syllabus

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

Semester Offered

Spring

Summer 1

Credits 3

Lecture Hours 3

Lab Hours 0

Extended Hours 1

Contact Hours 64

State Approval Code 27.0101.56 19

Instructor Name Roberta Collinsworth

Semester/Year Spring 2025

Meeting Time and Location

Math 1350.401 Online

Students are expected to spend at least 3-4 hours a week.

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.

Student Basic Needs

Unexpected circumstances may arise, but Panola College offers various resources to support students. If you need mental health services or are facing challenges with transportation, affording class materials and supplies, or accessing food regularly—issues that may impact your class performance—please visit panola.edu/resources.

Class Attendance

Regular and punctual attendance of classes and laboratories is required of all students. When a student has been ill or absent from class for approved extracurricular activities, he or she should be allowed, as far as possible, to make up for the missed work. If a student has not actively participated by the census date, they will be dropped by the instructor for non-attendance. This policy applies to courses that are in-person, online, hybrid, and hyflex.

Attendance in online courses is determined by submission of an assignment or participation in an activity. According to federal guidelines, simply logging into a distance learning course without participating in an academic assignment does not constitute attendance. Distance learning is defined as when a majority (more than 50%) of instruction occurs when the instructor and students are in separate physical locations. Students must engage in an academic activity prior to the course census date.

When an instructor feels that a student has been absent to such a degree as to invalidate the learning experience, the instructor may recommend to the Vice President of Instruction that the student be withdrawn from the course. Instructors may seek to withdraw students for non-attendance after they have accumulated the following number of absences:

Fall or spring semesters:

3 or more class meeting times per week - 5 absences

2 class meeting times per week - 3 absences

1 class meeting per week - 2 absences

The student is responsible for seeing that he or she has been officially withdrawn from a class. A student who stops attendance in a class without officially withdrawing from that class will be given a failing grade; consequently, the student must follow official withdrawal procedures in the Admissions/Records Office.

Please note: Health Science and Cosmetology courses may require more stringent attendance policies based on their accreditation agencies. Please see the addendum and/or program handbook for further information concerning attendance.

Pregnant/Parenting Policy

Panola College welcomes pregnant and parenting students as a part of the student body. This institution is committed to providing support and adaptations for a successful educational experience for pregnant and parenting students. Students experiencing a need for accommodations related to pregnancy or parenting will find a Pregnancy and Parenting Accommodations Request form in the Student Handbook or may request the form from the course instructor.

Artificial Intelligence (AI) Course Policy

There are situations throughout the course where you may be permitted to use artificial intelligence (AI) tools to aide in further understanding of mathematical concepts. However, AI tools may not be used for any graded assignments including but not limited to exams, quizzes, and projects. Use of any AI-generated content in this course without the instructor's consent qualifies as academic dishonesty and violates Panola College's standards of academic integrity.

Student Learning Outcomes

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

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

Instructional Goals and Purposes

The purpose of this course is to: Demonstrate

1. Competence in applying both inductive and deductive methods of reasoning.

2. Competence in using set notation and identifying the union and intersection of sets.
3. Competence in identifying functions and relations and their graphs.
4. Competence in using various numerical representations of the number system, including different bases and scientific notation.
5. Competence in solving problems using properties of the whole numbers.
6. Competence in solving problems using the properties of the integers and ordering the integers.
7. Competence in applying the rules of number theory to the integers.
8. Competence in solving problems using the properties of the rational numbers.
9. Competence in solving problems using the properties of the real numbers.
10. Competence in solving geometry problems involving area, volume, constructions and congruence, parallel and perpendicular lines and translations, and the metric system.
11. Competence in organizing and representing statistical data, measuring central tendencies, and solving problems involving permutations and combinations.
12. Competence in computing slope and distance, and then using this knowledge to write the equations of lines.

Learning Outcomes

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. Given a sequence of numbers, complete the missing terms of the sequence and write the formula defining the sequence.
2. Identify the three types of valid arguments and draw Venn diagrams representing them.
3. Given true premises, supply a conclusion implied by the premises and identify if the argument is valid or invalid.
4. Identify the strategies for solving problems and use them to solve problems.
5. Given a set, identify the elements of the set and use proper set notation to name the set.
6. List the elements of the well-defined set using set-builder notation.
7. Define and apply the following: set union, set intersection, set complement, empty set, subset have and proper subset. Draw Venn diagrams to represent each.
8. Define and apply the Cartesian product (cross product).
9. Prove with sets and with Venn diagrams the properties of set union and set intersection.
10. Define and identify a relation and a function, and distinguish between the two.
11. Identify the domain and range of a relation and a function.
12. Define the reflexive, symmetric and transitive properties, and given a relation, discuss whether the relation is reflexive, symmetric or transitive.
13. Define an equivalence relation, and discuss whether a relation is an equivalence relation.
14. Determine the cardinality of a set.
15. Given two sets, determine whether the sets can be paired in a one-to-one correspondence.
16. Describe the features, advantages and disadvantages of the early systems of numeration.
17. Given a Hindu-Arabic numeral, write the number in each of the early numeration systems. Write numerals from other systems into a Hindu-Arabic numeral.
18. Define exponent and apply the properties of exponents when solving problems.
19. Write a number in scientific notation, in standard form and expanded form.
20. Correctly read and write numbers in the Hindu-Arabic numeration system.

21. Define "number system" and use the roster method to define the set of whole numbers.
22. Define "addition" of whole numbers, and correctly identify the addends and the sum.
23. Apply the following properties of whole numbers: the closure property, the commutative property, the associative property, the identity property, and model or prove these properties given sets A, B, and C.
24. Define "multiplication" of whole numbers and correctly identify the factors and the product.
25. Define "subtraction" of whole numbers and correctly identify the minuend, subtrahend, and the difference.
26. Define "division" of whole numbers and correctly identify the dividend, divisor, quotient, and the remainder.
27. Define "algorithm" and use the Division Algorithm to find the quotient and the remainder.
28. Convert numbers in other bases to base ten and numbers in base ten to other bases.
29. Add, subtract, multiply and divide in other bases.
30. Use the roster method to identify the set of integers.
31. Apply the properties of integers when solving problems.
32. Add, subtract, multiply and divide integers, and use models to demonstrate the answer.
33. Apply the properties of inequalities for integers.
34. State the "Law of Trichotomy" for integers.
35. Define "absolute value" and use the definition to describe distance on a number line.
36. For two integers, define "a divides b."
37. State the divisibility rules and use them to determine factors of a given number.
38. Use the Sieve of Eratosthenes to find the prime numbers between 1 – 100.
39. State the Fundamental Theorem of Arithmetic and use it to give the prime factorization of any integer.
40. Given two numbers, find the greatest common factor (GCD) and the least common multiple (LCM) using prime factorization. Use Euclid's Method to find the GCD of two integers.
41. Perform operations in clock arithmetic or modular arithmetic.

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/Assessments

The following items are assigned and assessed during the semester and used to calculate the student's final grade.

Assignments

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 and 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.

Assessments

1. Homework and quizzes
2. Exams per chapter or over combined chapters
3. Math education assignments/Projects/Group work/Research/Observations
4. Comprehensive Final Exam

Course Grade

Class Participation 10%	10%
Homework/Quiz Average 15%	15%
Math Education/Projects/Research/Observations 15%	15%
Exams 40%	40%
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

- Community College.
- Canvas
- Computer access
- Internet / wifi connection
- Webcam
- Pdf scanner (smartphone apps can do this)
- Required printed material

Addendum

Additional Information for Math 1350

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: <https://www.panolacollegestore.com>.
- For testing services, use the following link: <https://www.panola.edu/student-services/student-support/academic-testing-center>.
- 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 Charles C. Matthews Student Center or go to <https://www.panola.edu/studentservices/student-support/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: <https://www.panola.edu/> (located on at the bottom under student)