

DEPARTMENT: Mathematics and Statistics

COURSE PREFIX: MAT

COURSE NUMBER: 215

CREDIT HOURS: 3

I. TITLE:

Mathematics for Middle and Elementary Teachers II

II. COURSE DESCRIPTION AND PREREQUISITE(S):

Geometry, measurements, probability and statistics for elementary and middle school teachers. Cannot be used for university studies requirements

Prerequisite(s): Math ACT score of at least 20 or KYOTE score of at least 22 or a COMPASS algebra score of at least 41 or MAT 097.

III. COURSE OBJECTIVES:

The student will be able to:

- A. Demonstrate utility with relevant mathematical vocabulary by correctly interpreting and using that vocabulary.
- B. Demonstrate utility with relevant mathematical notation by correctly interpreting and using that notation.
- C. Analyze and apply properties of the relationships between angles in plane figures.
- D. Compare, contrast, and classify geometric figures in a plane and in space.
- E. Calculate and convert measurements in 1, 2 or 3 dimensions.
- F. Describe, perform, and demonstrate recognition of symmetries and transformations.
- G. Apply congruence and similarity properties.
- H. Prove selected relationships using a 2-column proof method (e.g. the sum of interior angle measures of a triangle is 180°)
- I. Organize and represent data.
- J. Calculate measures of central tendency and variation, percentiles, z-scores, and explain what the answer means.
- K. Calculate probability or odds for a given situation.
- L. Apply counting principles in appropriate situations.

IV. CONTENT OUTLINE:

- A. Fundamentals of Geometry
 - a. Vocabulary and notation in geometry
 - b. Classify geometric figures in a plane and in space
 - c. Properties of geometric figures in a plane and in space
 - d. Represent solid geometric in a plane with nets
 - e. Triangle relationships (e.g. Isosceles triangle theorem, Pythagorean theorem, and their converses)
- B. Measurement
 - a. Convert units within and between the Metric system and U.S. Customary system
 - b. Calculate measurements such as area, perimeter, volume, and surface area
 - c. Connections between the concepts of measurements such as length, area, perimeter, volume, and surface area
- C. Transformations / Symmetry / Congruence and Similarity
 - a. Rigid motions in a plane (rotation, reflection, translation, glide-reflection)
 - b. Dilations and symmetry transformations
 - c. Reflection, rotation, and point symmetry
 - d. Congruence or similarity of triangles and other plane figures
- D. Statistics
 - a. Calculate and differentiate between the three measures of central tendency
 - b. Calculate and differentiate between measures of variation
 - c. Dot plots, stem and leaf plots, histograms, box and whisker plots and other methods of data representation
 - d. Recognize sampling errors in statistical data, or misleading representations of data
 - e. Concepts in statistical inference, and use them to solve problems
- E. Probability
 - a. Calculate experimental, theoretical and conditional probabilities, odds, and expected values
 - b. Correctly apply the counting principles, including permutations and combinations
- F. Solve problems or prove relationships related to the concepts mentioned above

V. INSTRUCTIONAL ACTIVITIES:

A significant portion of the course will be taught by lecture. Occasional group learning activities will be provided during class time to introduce new topics. Group activities and homework will serve to clarify demonstration of learning objectives and reinforce course content.

VI. FIELD, CLINICAL, AND/OR LABORATORY EXPERIENCES:

None.

VII. TEXT(S) AND RESOURCES:

Mathematical Reasoning for Elementary Teachers, 6th edition, 2012, Long, DeTemple & Millman; Pearson Education, Inc.

Calculators are encouraged, and a four-function calculator is sufficient for all work.

VIII. EVALUATION AND GRADING PROCEDURES:

Homework (10%): Homework will be assigned daily and graded regularly. Selected problems will be presented by students during the following class. Lack of participation may result in loss of points on the assignment. Group activities may or may not be assigned a homework grade.

Writing Assignment (5-10%): A writing assignment will be assigned during the semester. A handout outlining details of the project will be provided. Potential assignments include: analysis of an elementary school mathematics textbook and a discussion of selected methods used in the book, analysis of the Kentucky Core Academic Standards (KCAS) and a discussion of selected standards, review of a children’s book involving some aspect of mathematics, or some other assignment as deemed appropriate by the instructor.

Exams (60-70%): There will be 3-4 mid-term exams throughout the semester, and each will be announced at least one (1) week prior to the exam date. Unexcused absences from an exam will result in a grade of zero (0) for that exam.

Final Exam (15-20%): A comprehensive final exam will be given during Finals Week.

Letter grades will be assigned by the following scale:

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

IX. ATTENDANCE POLICY:

Students are expected to adhere to the MSU Attendance Policy outlined in the current MSU Bulletins.

Click here to enter additional attendance policy if necessary.

X. ACADEMIC HONESTY POLICY:

Murray State University takes seriously its moral and educational obligation to maintain high standards of academic honesty and ethical behavior. Instructors are expected to evaluate students’ academic achievements accurately, as well as ascertain that work submitted by students is authentic and the result of their own efforts, and consistent with established academic standards. Students are obligated to respect and abide by the basic standards of personal and professional integrity.

Violations of Academic Honesty include:

Cheating - Intentionally using or attempting to use unauthorized information such as books, notes, study aids, or other electronic, online, or digital devices in any academic exercise; as well as unauthorized communication of information by any means to or from others during any academic exercise.

Fabrication and Falsification - Intentional alteration or invention of any information or citation in an academic exercise. Falsification involves changing information whereas fabrication involves inventing or counterfeiting information.

Multiple Submission - The submission of substantial portions of the same academic work, including oral reports, for credit more than once without authorization from the instructor.

Plagiarism - Intentionally or knowingly representing the words, ideas, creative work, or data of someone else as one’s own in any academic exercise, without due and proper acknowledgement.

Instructors should outline their expectations that may go beyond the scope of this policy at the beginning of each course and identify such expectations and restrictions in the course syllabus. When an instructor receives evidence, either directly or

indirectly, of academic dishonesty, he or she should investigate the instance. The faculty member should then take appropriate disciplinary action.

Disciplinary action may include, but is not limited to the following:

- 1) Requiring the student(s) to repeat the exercise or do additional related exercise(s).
- 2) Lowering the grade or failing the student(s) on the particular exercise(s) involved.
- 3) Lowering the grade or failing the student(s) in the course.

If the disciplinary action results in the awarding of a grade of E in the course, the student(s) may not drop the course.

Faculty reserve the right to invalidate any exercise or other evaluative measures if substantial evidence exists that the integrity of the exercise has been compromised. Faculty also reserve the right to document in the course syllabi further academic honesty policy elements related to the individual disciplines.

A student may appeal the decision of the faculty member with the department chair in writing within five working days. Note: If, at any point in this process, the student alleges that actions have taken place that may be in violation of the Murray State University Non-Discrimination Statement, this process must be suspended and the matter be directed to the Office of Equal Opportunity. Any appeal will be forwarded to the appropriate university committee as determined by the Provost.

XI. NON-DISCRIMINATION POLICY AND STUDENTS WITH DISABILITIES:

Policy Statement

Murray State University endorses the intent of all federal and state laws created to prohibit discrimination. Murray State University does not discriminate on the basis of race, color, national origin, gender, sexual orientation, religion, age, veteran status, or disability in employment, admissions, or the provision of services and provides, upon request, reasonable accommodation including auxiliary aids and services necessary to afford individuals with disabilities equal access to participate in all programs and activities. For more information, contact the Executive Director of Institutional Diversity, Equity and Access, 103 Wells Hall, (270) 809-3155 (voice), (270) 809-3361 (TDD).

Students with Disabilities

Students requiring special assistance due to a disability should visit the Office of Student Disability Services immediately for assistance with accommodations. For more information, students should contact the Office of Student Disability Services, 423 Wells Hall, Murray, KY 42017. 270-809-2018 (voice) 270-809-5889 (TTD).

XII. Other required departmental or collegiate committee information

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