

Course Outline of Record

1. Course Code: MATH-030
2.
 - a. Long Course Title: Plane Geometry
 - b. Short Course Title: PLANE GEOMETRY
3.
 - a. Catalog Course Description:
This course examines fundamentals of plane geometry, including topics in solid and coordinate geometry, developed by both inductive and deductive processes.
 - b. Class Schedule Course Description:
The fundamentals of plane geometry with topics in solid and coordinate geometry, especially as developed through logical deduction.
 - c. Semester Cycle (*if applicable*): Fall, Spring
 - d. Name of Approved Program(s):
 - MATHEMATICS Associate in Science for Transfer Degree (AS-T)
4. Total Units: 3.00 Total Semester Hrs: 54.00
 Lecture Units: 3 Semester Lecture Hrs: 54.00
 Lab Units: 0 Semester Lab Hrs: 0
 Class Size Maximum: 35 Allow Audit: No
 Repeatability No Repeats Allowed
 Justification 0
5. Prerequisite or Corequisite Courses or Advisories:
Course with requisite(s) and/or advisory is required to complete Content Review Matrix (CCForm I-A)
 Prerequisite: MATH 054
6. Textbooks, Required Reading or Software: (*List in APA or MLA format.*)
 - a. Lial, Brown, Steffensen, Johnson (0). *Essentials of Geometry for College Students, Vol. 1 (Books I and II) (2nd /e)*. Pearson/Addison Wesley. ISBN: 0-201-74882-7
 College Level: No
 Flesch-Kincaid reading level: 8.8
 - b. Sir Thomas Heath (0). *Euclid, The Thirteen Books of The Elements, Translated with introduction and commentary (2nd /e)*. Dover Unabridged. ISBN: 0-486-60088-2
 College Level: No
 Flesch-Kincaid reading level: 8.8
7. Entrance Skills: *Before entering the course students must be able:*
 - a. Understand the Real Number System, including the following subsets of the Reals: Integers, Rationals, and Irrationals.
 - MATH 054 - Identify, recognize and classify real numbers, as integers, rationals, or irrationals and locate their approximate positions on the real number line.
 - b. Understand and use the commutative, associative, distributive, identity, and inverse properties of the Real Numbers under the operations of addition and multiplication.
 - MATH 054 - Apply the commutative, associative, distributive, identity, and inverse properties to simplify algebraic expressions involving polynomial, rational and radical expressions - perform arithmetic operations with algebraic expressions using the order of operations.
 - c. Understand the concepts of variables and how variables can be used to represent unknown quantities.
 - MATH 054 - Understand the concepts of variables and how variables can be used to represent an unknown quantity or a range of quantities.
 - d. Use variables to create algebraic expressions that model an application problem.

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- MATH 054 - Use variables to create algebraic expressions that model quantities in an application problem.
- e. Apply the commutative, associative, distributive, identity, and inverse properties to simplify algebraic expressions - perform arithmetic operations with algebraic expressions using the order of operations.
 - MATH 054 - Apply the commutative, associative, distributive, identity, and inverse properties to simplify algebraic expressions involving polynomial, rational and radical expressions - perform arithmetic operations with algebraic expressions using the order of operations.
- f. Understand and use the properties of integer exponents to simplify algebraic expressions, including expressions involving scientific notation.
 - MATH 054 - Use the properties of integer exponents to simplify algebraic expressions, including expressions involving scientific notation.
- g. Understand the concept of an algebraic equation and the meaning of a solution to the equation.
 - MATH 054 - Analyze the concept of an algebraic equation and demonstrate the meaning of a solution to the equation, including integer, non-integer rational, decimal and radical solutions.
- h. Use variables with the algebraic method to create algebraic equations or inequalities that model an application problem.
 - MATH 054 - Employ variables to create algebraic equations or inequalities that model an application problem.
- i. Understand and use the addition, subtraction, multiplication, and division properties of equality to solve linear equations.
 - MATH 054 - Use properties of equality to solve linear equations in one variable and describe the solution using set notation.
- j. Understand and use the addition, subtraction, multiplication, and division properties of inequality to solve linear inequalities and graph the solution on the number line.
 - MATH 054 - Use the properties of inequality to solve linear inequalities in one variable and describe the solution set in set notation and graphically.
- k. Add, subtract, multiply and divide polynomials.
 - MATH 054 - Add, subtract, multiply and divide polynomials.
- l. Factor out the greatest common divisor from a polynomial expression and factor quadratic binomials and trinomials over the rationals.
 - MATH 054 - Factor the greatest common divisor from a polynomial expression and factor quadratic binomials and trinomials with integer coefficients.
- m. Apply the zero product principle to solve quadratic equations by factoring.
 - MATH 054 - Solve quadratic equations in one variable by factoring and applying the zero product property.
- n. Add, subtract, multiply, divide and simplify rational expressions.
 - MATH 054 - Add, subtract, multiply, divide and simplify rational expressions.
- o. Solve rational equations that simplify to linear equations.
 - MATH 054 - Solve rational equations that simplify to linear or quadratic equations.
- p. Understand square roots and solve square root equations.
 - MATH 054 - Interpret square roots and solve square root equations.
- q. Understand the Cartesian coordinate system and use it to graph linear equations by plotting points.
 - MATH 054 - Convert between the geometric (Cartesian) and algebraic representations of a linear relation in two variables. Make use of point-slope and slope intercept forms.
- r. Understand the connection between the solution of an equation with two variables and the graph of that equation.
 - MATH 054 - Convert between the geometric (Cartesian) and algebraic representations of a linear relation in two variables. Make use of point-slope and slope intercept forms.
- s. Understand the meaning of the slope of a line and find an equation for a line using general forms including point-slope and slope intercept.
 - MATH 054 - Convert between the geometric (Cartesian) and algebraic representations of a linear relation in two variables. Make use of point-slope and slope intercept forms.
 - MATH 054 - Interpret the meaning of the slope of a line as a constant rate of change.
- t. Apply learned principles and skills to new situations in addition to situations that mimic those on the homework

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and those shown in class.

- MATH 054 - Apply learned principles and skills to novel situations in addition to situations that mimic those on the homework and those shown in class.

u. Proper use of mathematic notation so that each student can simplify an expression using a clearly displayed format and demonstrating each mathematical step.

- MATH 054 - Use mathematical language to communicate ideas, especially in writing.

v. Application (word) problems that involve all of these skills and concepts

w. Square Roots and Pythagorean Theorem.

- MATH 054 - Deduce right triangle side lengths using the Pythagorean Theorem and square roots.

x. Understand and use basic formulas from geometry including perimeter, area, and volume.

- MATH 054 - Use basic formulas from geometry to find perimeter, area and volume of basic figures.

y. Apply units and unit conversion appropriately to solve application word problems that involve their use.

Dimensional Analysis.

- MATH 054 - Use dimensional analysis appropriately in applications.

8. Course Content and Scope:

Lecture:

1. Formal Proofs
2. Lines, Planes and Space
3. Angles
4. Triangles
5. Perpendiculars
6. Parallels
7. Areas
8. Similarity
9. Circles
10. Spheres
11. Volumes
12. Loci

Lab: *(if the "Lab Hours" is greater than zero this is required)*

9. Course Student Learning Outcomes:

1. Use geometry to show critical and logical thinking.
2. Use deductive reasoning skills in the axiomatic theory of geometry.
3. Use Geometry in real-world situations.
4. Value the importance of using deductive reasoning and disciplined thinking.

10. Course Objectives: *Upon completion of this course, students will be able to:*

- a. Apply the principles of deductive reasoning in geometry and its applications.
- b. Develop a knowledge and appreciation of the fundamental proposition symbols.
- c. Develop the practice of defining terms, thinking accurately, establishing conclusions through deductive reasoning, realizing:
 - i. the importance of precise definitions in every body of knowledge;
 - ii. how axioms and postulates of mathematics are necessary assumptions given without proof;
 - iii. how propositions build on postulates and how basic propositions are used to prove more advanced propositions.
- d. Develop intellectual maturity beyond mere recitation and rote learning of the facts of geometry.
- e. Communicate effectively with the instructor and mathematical community using proper terminology and correct notation.
- f. Independently analyze and set up application problems, thus applying problem solving techniques to new situations. Also, anticipate and check proposed solutions.

11. Methods of Instruction: *(Integration: Elements should validate parallel course outline elements)*

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a. Discussion

b. Lecture

Other Methods:

Teamwork and discussion, to review, analyze, and evaluate various methods of solution

12. Assignments: *(List samples of specific activities/assignments students are expected to complete both in and outside of class.)*

In Class Hours: 54.00

Outside Class Hours: 108.00

a. In-class Assignments

- a. Attend classroom lectures and take notes; participate in discussion.
- b. Attend and participate in lab.
- c. Participate in discussion groups to review, analyze, diagnose, and evaluate methods of solution used on homework.
- d. Complete examinations involving problems that require the application of studied principles and skills to new situations as well as problems that mimic those done on homework and in class.
- e. Complete challenging problem sets requiring careful reasoning and application of a variety of course topics.

b. Out-of-class Assignments

- a. Reading textbook and supplementary assignments.
- b. Attending classroom lectures and taking notes.
- c. Completing assigned homework including problem solving, exercises to improve skills and mathematical understanding.
- d. Participate in classroom discussions to review, analyze, diagnose and evaluate various methods of solution used on homework.
- e. Complete examinations involving problems that apply studied principles to new situations.

13. Methods of Evaluating Student Progress: *The student will demonstrate proficiency by:*

- Written homework
- Computational/problem solving evaluations
- Mid-term and final evaluations
- Student participation/contribution
- Other
 - a. Performance on regularly assigned homework assignments
 - b. Performance on chapter examinations
 - c. Performance on a 2-hour comprehensive final examination

14. Methods of Evaluating: Additional Assessment Information:

15. Need/Purpose/Rationale -- *All courses must meet one or more CCC missions.*

PO-GE C4.b - Language & Rationality (Communication & Analytical Thinking)

Gather, assess, and interpret relevant information.

Apply logical and critical thinking to solve problems; explain conclusions; and evaluate, support, or critique the thinking of others.

IO - Scientific Inquiry

Analyze quantitative and qualitative information to make decisions, judgments, and pose questions.

IO - Global Citizenship - Scientific & Technological Literacy

Utilize quantitative expression in a variety of contexts. These would include units of measurement, visual representations, and scales and distributions.

Synthesize, interpret, and infer, utilizing information, data, and experience to solve problems, innovate, and explore solutions.

16. Comparable Transfer Course

University System

Campus

Course Number

Course Title

Catalog Year

17. Special Materials and/or Equipment Required of Students:

18. Materials Fees: Required Material?

| Material or Item | Cost Per Unit | Total Cost |
|-------------------------|----------------------|-------------------|
|-------------------------|----------------------|-------------------|

19. Provide Reasons for the Substantial Modifications or New Course:

Periodic Review

20. a. Cross-Listed Course (Enter Course Code): *N/A*
 b. Replacement Course (Enter original Course Code): *N/A*

21. Grading Method (choose one): Letter Grade Only

22. MIS Course Data Elements

- a. Course Control Number [CB00]: CCC000310970
- b. T.O.P. Code [CB03]: 170100.00 - Mathematics, General
- c. Credit Status [CB04]: C - Credit - Not Degree Applicable
- d. Course Transfer Status [CB05]: C = Non-Transferable
- e. Basic Skills Status [CB08]: 1B = Course is a basic skills course
- f. Vocational Status [CB09]: Not Occupational
- g. Course Classification [CB11]: Y - Credit Course
- h. Special Class Status [CB13]: N - Not Special
- i. Course CAN Code [CB14]: *N/A*
- j. Course Prior to College Level [CB21]: A = 1 Level Below
- k. Course Noncredit Category [CB22]: Y - Not Applicable
- l. Funding Agency Category [CB23]: Y = Not Applicable
- m. Program Status [CB24]: 2 = Stand-alone

Name of Approved Program (if program-applicable): MATHEMATICS

Attach listings of Degree and/or Certificate Programs showing this course as a required or a restricted elective.)

23. Enrollment - Estimate Enrollment

First Year: 0
 Third Year: 0

24. Resources - Faculty - Discipline and Other Qualifications:

- a. Sufficient Faculty Resources: Yes
- b. If No, list number of FTE needed to offer this course: *N/A*

25. Additional Equipment and/or Supplies Needed and Source of Funding.

N/A

26. Additional Construction or Modification of Existing Classroom Space Needed. (Explain:)

N/A

27. FOR NEW OR SUBSTANTIALLY MODIFIED COURSES

Library and/or Learning Resources Present in the Collection are Sufficient to Meet the Need of the Students Enrolled in the Course: Yes

28. Originator Daniel, P Kleinfelter Origination Date 04/26/17