GEOMETRY FOR TEACHERS
MATH 1420

Class Hours: 3.0   **Credit Hours: 3.0**

Laboratory Hours: 0.0   **Date Revised: Fall 2016**

Catalog Course Description:

Topics include two- and three-dimensional geometry, congruence and similarity, constructions, transformations, area, volume, surface area and measurements, with an emphasis on mathematical understanding necessary to teach effectively.

Prerequisites:

High school algebra I, algebra II, geometry and ACT math score of at least 19 or equivalent math placement score or successful completion of MATH 0010 or MATH 0030 or MATH 0530 as required.

Textbook(s) and Other Reference Materials Basic to the Course:

Textbook:

Judith Sowder, Larry Sowder and Susan Nickerson. *Reconceptualizing Mathematics for Elementary School Teachers,* 2nd edition. WH Freeman and Company, NY.

Required Supplies:

Praxis: Core Academic Skills for Educators (5712, 5722, 5732), Learning Express, LLC, 2014.

Personal Equipment:

Scientific calculator with fractional capabilities is required. A graphing calculator such as the TI-84 or TI-84 Plus is recommended.

I.   Week/Unit/Topic Basis:

Week   Topic

1.   Basic Ideas and Building Blocks of Geometry, Learning to Measure

2.   Angle Relationships, Perpendicular Lines, Parallel Lines and Planes

3.   Angles of a Triangle, Angles of a Polygon, Inductive Reasoning

4.   Deductive Reasoning, Congruent Triangles, Introduction to Proofs

5.   Review, Exam 1

6.   Quadrilaterals

7.   Similarity, Pythagorean Theorem

8.   Circles

9.   Perimeter, Area

10.   Review, Exam 2

11.   Three Dimensional Figures, Surface Area, Volume

12.   Congruence Transformations, Symmetry and Tessellations

13.   Data Displays, Probability and Statistics

14.   Exam 3, Review for Final

15.   Comprehensive Final Exam

II. Course Goals*:

The course will:

A.   Build skills to master critical thinking. VI.2, 3, 4, 6

B.   Understand mathematical reasoning in order to read, comprehend, and construct mathematical arguments. VI.1, 2, 3, 4, 6

C.   Understand the real life applicability of geometry. VI.2, 3, 4, 6

D.   Gain experiences in measurement, using metric and standard units. VI.3 ,4, 5

E.   Master classifications of two and three-dimensional figures and know their properties and relationships. VI.2, 3, 4, 5

F.   Learn the undefined and defined terms which relate to geometric figures. VI.1, 2, 3, 5

G.   Understand the different types of transformations and how we use them every day. VI.3, 4

H.   Apply modeling tools (manipulatives) to demonstrate mathematical ideas and processes. VI.1, 4, 5, 6

*Roman numerals after course goals reference the General Education Goals of the Mathematics program.

III. Expected Learning Outcomes*:

Students will be able to:

1. Describe points, curves, and planes. F

2. Measure line segments and angles. D, F

3. Understand definitions of all polygons and their classifications. E, F

4. Understand and use the Pythagorean Theorem. D, E, F

5. Understand what congruence and similarity mean. A, B, C, F, H

6. Discover and apply the definition and properties of parallel lines and transversals. A, B, C, F

7. Calculate the perimeter and area of parallelograms, triangles, trapezoids, regular polygons, and composite figures. A, B, C, D, E, H

8. Apply numerical relationships in similar figures, ratios and proportions, and triangles. A, B, C, D, E

9. Understand definitions of circles. A, B, C, E, F, H

10. Understand definitions of three-dimensional geometric figures. A, B, C, E, F, H

11. Calculate the surface area and volume of prisms, pyramids, cylinders, cones and composite figures. C, D, E, F

12. Understand the different types of transformations and symmetries. G, H

13. Communicate about different methods of solving problems. A, B, C, F, H

14. Consider data from other areas and subjects. A, C, D

15. Recognize connections between various geometrical ideas and areas such as science, art, and landscaping. A, C, D

16. Utilize manipulatives to model math algorithms and problem solving. H

*Capital letters after Expected Student Learning Outcomes reference the course goals listed above.

IV. Evaluation:

A. Testing Procedures:

Students are evaluated primarily on the basis of tests, quizzes, homework, portfolio, projects and/or a comprehensive final exam. A minimum of three major tests (in addition to the final) is recommended.

B. Laboratory Expectations:

0% of grade or instructor's discretion

Students will be expected to keep a portfolio of all laboratory experiments and projects. The portfolio will serve as a collateral file of future teaching references.

C. Field Work:

N/A

D. Other Evaluation Methods:

Excessive absences may lower the final grade.

E. Grading Scale:

93-100   A
88-92   B+
83-87   B
78-82   C+
70-77   C
60-69   D
Below 60   F

V. Policies:

Attendance Policy:

Pellissippi State Community College expects students to attend all scheduled instructional activities. As a minimum, students in all courses (excluding distance-learning courses) must be present for at least 75 percent of their scheduled class and laboratory meetings in order to receive credit for the course. Individual departments/programs/disciplines, with approval of the vice president of Academic Affairs may have requirements that are more stringent. In very specific circumstances, an appeal of the policy may be addressed to the head of the department in which the course was taken. If further action is warranted, the appeal may be addressed to the vice president of Academic Affairs.

Academic Dishonesty:

Academic misconduct committed either directly or indirectly by an individual or group is subject to disciplinary action. Prohibited activities include but are not limited to the following practices:

- Cheating, including but not limited to unauthorized assistance from material, people, or devices when taking a test, quiz, or examination; writing papers or reports; solving problems; or completing academic assignments.
- Plagiarism, including but not limited to paraphrasing, summarizing, or directly quoting published or unpublished work of another person, including outline or computerized services, without proper documentation of the original source.
- Purchasing or otherwise obtaining prewritten essays, research papers, or materials prepared by another person or agency that sells term papers or academic materials to be presented as one's own work.
- Taking an exam for another student
- Providing others with information and/or answers regarding exams, quizzes, homework or other classroom assignments unless explicitly authorized by the instructor.
- Any of the above occurring within the Web or distance learning environment

Please see the Pellissippi State Policies and Procedures Manual, Policy 04:02:00 Academic/Classroom Conduct and Disciplinary Sanctions for the complete policy.

Accommodations for Disabilities:

Students that need accommodations because of a disability, have emergency medical information to share, or need special arrangements in case the building must be evacuated should inform the instructor immediately, privately after class or in her or his office. Students must present a current accommodation plan from a staff member in Disability Services (DS) in order to receive accommodations in this course. Disability Services (http://www.pstcc.edu/sswd/) may be contacted via email or by visiting Alexander 130.

Other Policies:

Make Up Work: Instructor discretion about make-up tests and/or assignments.

Cell Phones: Cell phones are to be either turned off or put on vibration mode while in class. Instructor discretion as to penalty.