

**Common Course Outline**  
**MATH 132**  
**Concepts of Mathematics II: Geometry and Measurement**  
**4 Semester Hours**

**The Community College of Baltimore County**

**Description**

Students will learn the concepts and principles of geometry taught in elementary education. Topics include geometric vocabulary, concepts and skills in two and three dimensions, coordinate geometry, metric and non-metric geometry, and measurement. Prerequisites: (MATH 083 or MATH 101 or LVM 3) or sufficient math placement score and (ENGL 052 or LVE2); and (RDNG 052 or ESOL 054 or LVR2).

**Overall Course Objectives**

Upon successfully completing the course students will be able to:

1. apply appropriate problem solving strategies, including the use of computers and calculators, to solve a variety of geometric problems (both standard and non-standard) (I, III, IV, VI, 1, 4, 6, 7);
2. distinguish between two-dimensional geometric figures through notation, classifications, properties, and relationships with other figures (I, II, III, 1, 2);
3. distinguish between three-dimensional geometric figures through notation, classifications, properties, and relationships with other figures (I, II, III, 1, 2);
4. perform constructions and analyze both the constructions and the resulting figures, both manually and using computer technology (II, III, 1, 2, 4);
5. analyze the various properties of shapes within a plane using transformations (translations, rotations, reflections) and symmetries (I, II, III, IV, 1, 2, 4, 7);
6. use the concepts of magnification, similarity, and congruence to classify geometric figures (I, 1, 2, 4);
7. create tessellations using both regular polygons and non-regular figures (I, V, 2, 6, 7);
8. use both the customary (English) and metric systems in an appropriate manner to perform measurements (i.e. length, mass, capacity, temperature, time) (I, VI, 4, 7);
9. apply appropriate measurement formulas (i.e. perimeter, area, volume, etc.) and properly interpret the results (I, II, III, 1, 2, 3, 7);
10. use appropriate instruments to perform measurements (i.e. geoboards, rulers, etc.) (III, V, 1, 6, 7);
11. illustrate geometric concepts and interpret information from coordinate graphs (I, II, III, 1, 2, 3)

12. relate the concepts discussed throughout the course to the students' physical surroundings (III, V, VI, 7);
13. utilize the Internet and other resources to research course-related topics (I, III, VI, 1, 3, 5, 6, 7).
14. discuss the origin and development of fundamental geometric concepts and their implications for the present and the future (worldwide) (II, IV, V, 2, 5)

### **Major Topics**

1. Introductory Geometry
  - a. Definition of geometry
  - b. Basic notions (point, line, plane, etc.)
2. Two-Dimensional Geometry
  - a. Angles, lines and planes
  - b. Polygons and circles
3. Three-Dimensional Geometry
  - a. Lines and planes in space
  - b. Polyhedra and spheres
4. Coordinate Geometry
  - a. Cartesian (rectangular) coordinate system
  - b. Linear equations and related concepts
5. Transformational Geometry and Tessellations
  - a. Translations, rotations, reflections, magnification
  - b. Symmetries
  - c. Tessellations
6. Constructions and Similarity
  - a. Congruence of figures
  - b. Constructions involving two-dimensional figures
  - c. Analysis of similar figures
7. Measurement
  - a. Customary and metric units
  - b. Perimeter, area, and volume
  - c. Pythagorean Theorem

### **Course Requirements (General Education Goal #VII)**

Students will be given opportunities to collaborate via groupwork and/or oral presentation of problem solutions.

There will be multiple opportunities for the instructor to assess student progress through classwork and/or homework.

Grading: Grading procedures will be determined by the individual faculty member but will include the following:

1. Three (3) written examinations or portfolio packets (80% applications based)
2. Cumulative final examination or comprehensive portfolio
3. Three (3) written projects
4. Individual and group classwork
5. Oral presentation of problem solutions

## **Other Course Information**

Individual faculty members may include additional course objectives, major topics, and other course requirements to the minimum expectations stated in the Common Course Outline.

The Community College of Baltimore County is committed to providing a high-quality learning experience that results in growth in knowledge, attitudes, and skills necessary to function successfully as a transfer student, in a career and as a citizen. To accomplish this goal, we maintain high academic standards and expect students to accept responsibility for their individual growth by attending classes, completing all homework and other assignments, participating in class activities and preparing for tests.

We take seriously our responsibility to maintain high-quality programs and will periodically ask you to participate in assessment activities to determine whether our students are attaining the knowledge, attitudes and skills appropriate to various courses and programs. The assessment activities may take many different forms such as surveys, standardized or faculty-developed tests, discussion groups or portfolio evaluations. We ask that you take these activities seriously so that we can obtain valid data to use for the continuous improvement of CCBC's courses and programs.

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