**CCBC, Spring 2018 School of Mathematics and Science**

**20036, MATH 132, Concepts of Mathematics II, DU1 Mathematics Department**

**Description:**

**MATH 132 – 4 credits – Concepts of Mathematics II: Geometry and Measurement** examines the concepts and principles of geometry; covers 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 sufficient placement test score; and (ENGL 052 and RDNG 052) or ACLT 052.

1. Basic Course Information
   1. Instructor: Anthony Calise
   2. Office number: MASH RM 212

Phone number: 410-215-7694

Email address: acalise@ccbcmd.edu

* 1. Instructor's office hours: TR (6:20 – 7:20)
  2. Mathematics Department Phone Number (Dundalk): 443-840-3292
  3. Class meeting day(s), time(s) and location(s): MASH 212 TR 7:20 – 9:10
  4. Statement of Student Out of Class Work Expectations

This is a four-credit/billable hour course offered over 14 weeks. You are expected to complete **at least 8 hours** of work **per week** outside of the class including reading, class preparation, homework, studying, etc.

* 1. Materials:

1. **Textbook**: A Problem Solving Approach to Mathematics for Elementary School Teachers, 12th Edition; Billstein, Libeskind and Lott; Pearson.
2. **Calculator**: Ascientific calculator is recommended for this course.
3. **Geometric manipulatives**: Compass, protractor, and at least 6 inch ruler.
4. Course Goals Overall
   1. Course objectives as listed on the official Common Course Outline

Upon completion of this course the students will be able to:

1. apply appropriate problem solving strategies, including the use of appropriate computer technology and calculators, to solve a variety of geometric problems (both standard and non-standard);
2. distinguish between two-dimensional geometric figures through notation, classifications, properties, and relationships with other figures;
3. distinguish between three-dimensional geometric figures through notation, classifications, properties, and relationships with other figures;
4. perform constructions and analyze both the constructions and the resulting figures, both manually and using appropriate computer technology;
5. analyze the various properties of shapes within a plane using transformations (translations, rotations, reflections) and symmetries;
6. use the concepts of magnification, similarity, and congruence to classify geometric figures;
7. create tessellations using both regular polygons and non-regular figures as well manually and using appropriate computer technology;
8. use both the customary (English) and metric systems in an appropriate manner to perform measurements (e.g. length, mass, capacity, temperature, time);
9. perform multistep conversions involving global currencies, as well as metric and customary measure units (distance, weight, volume, time, etc.) to solve real world application problems;
10. apply appropriate measurement formulas (i.e. perimeter, area, volume, etc.) and properly interpret the results;
11. use appropriate instruments to perform measurements (i.e. geoboards, rulers, etc.);
12. illustrate geometric concepts and interpret information from coordinate graphs;
13. relate the concepts discussed throughout the course to the physical world with an emphasis on the significance of geometry on culture and society (e.g., architecture, art, etc.);
14. examine the mathematical contributions made by people from diverse cultures throughout history, and their cultural, and social significance;
15. discuss the origin and development of fundamental geometric concepts, and their implications for the present and in the future of math and its related concepts;
16. write formal proofs for properties of geometric objects and constructions;
17. construct and articulate solutions to real world problems, including ethical considerations, using geometry to support the argument, and
18. find, use, evaluate and cite academic resources for conducting research in mathematics.
    1. Major Topics as listed on the official Common Course Outline
19. Introductory Geometry
20. Definition of geometry
21. Basic notions (point, line, plane, etc.)
22. Two-Dimensional Geometry
23. Angles, lines and planes
24. Polygons and circles
25. Proofs regarding properties of two-dimensional figures
26. Three-Dimensional Geometry
27. Lines and planes in space
28. Polyhedra and spheres
29. Cultural and artistic applications
30. Coordinate Geometry
31. Cartesian (rectangular) coordinate system
32. Linear equations and related concepts
33. Transformational Geometry and Tessellations
34. Translations, rotations, reflections, magnification
35. Symmetries
36. Tessellations
37. Societal and cultural examples of tessellations and geometry
38. Constructions and Similarity
39. Congruence of figures
40. Constructions involving two-dimensional figures
41. Proofs regarding constructions
42. Analysis of similar figures
43. Proofs regarding similar figures
44. Fractals
45. Measurement
46. Customary and metric units
47. Perimeter, area, and volume
48. Pythagorean Theorem
    1. Rationale

This course provides students with the geometry topics that comply with the National Council of Teachers of Mathematics (NCTM) standards for mathematics education. Geometry concepts provides students with deductive reasoning skills, an understanding of symmetry in the world, a fundamental approach to perimeter, area, volume, similarity and congruency. Computer applications stress drawing techniques and logical thinking. Straight edge and compass constructions develop a deeper understanding of basic geometric relationships.

1. Evaluation
   1. Requirements (papers, oral reports, projects, quizzes, tests, final exam, etc.)

*Unit Exams: (4 Total 10% Each) = 40%*

*HW/Quizzes: (5 Total 2% Each) = 10%*

*Projects: (2 Total 10% Each) = 20%*

*Final Exam = 30%*

*Total Grade = 100%*

* 1. Instructor’s grading policy

A final course grade will be assigned using the following criteria:

|  |  |
| --- | --- |
| **Final Average** | **Final Grade** |
| At least 90% | A |
| At least 80% and less than 90% | B |
| At least 70% and less than 80% | C |
| At least 60% and less than 70% | D |
| Less than 60% | F |

* 1. Math Department Attendance policy:

1. You are expected to attend ALL scheduled classes.
2. Attendance is critical to student success in college.
3. Satisfactory attendance is defined to be at most 6 hours of unexcused absences.
4. Documentation of the reason for your absence(s) may be required.
5. The instructor may count each unexcused tardy arrival as an absence and each unexcused early departure as an absence.
   1. Math Department Audit policy: Students may change from credit to audit only during the published 50% refund period, as indicated in the CCBC academic calendar. Students who audit are required to attend class, participate in course activities, and complete assignments (except for tests and the final exam) in accordance with instructor guidelines and due dates. For students who do not meet these requirements, the instructor may change their grade from AU to W.
6. Course Procedures
   1. Course related policies and procedures (including course-specific links)
   2. College wide syllabus policies: [“For college wide syllabus policies such as the Code of Conduct related to Academic Integrity and Classroom Behavior or the Audit/ Withdrawal policy, please go to the Syllabus Tab on the MyCCBC page](https://myccbc.ccbcmd.edu/Pages/Default.aspx).”
   3. Contact information for course-related concerns: Students should first attempt to take concerns to the faculty member. If students are unable to resolve course-related concerns with the instructor, they should contact the Dundalk Mathematics Department Coordinator, Bob Brown, either at [rbrown2@ccbcmd.edu](mailto:rbrown2@ccbcmd.edu) or at 443-840-3744.
   4. Other material related to Course Procedures
   5. Course calendar/schedule

Spring 2017 Academic Calendar and final exam schedule:

<http://www.ccbcmd.edu/Resources-for-Students/Registering-for-Classes/Academic-Calendar.aspx>

This syllabus may be changed with notification to the class.