

Campbellsville University

MTH 402-01

Modern Geometry

TEXTBOOK: College Geometry: A Discovery Approach 2nd ed. by Kay

INSTRUCTOR: Chris Bullock  
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OFFICE HOURS: MWF 12-1 and 2-3  
TR 2-3:15  
or by appointment

1. DESCRIPTION OF COURSE: This course includes foundations of geometry, advanced Euclidean geometry, non-metric and metric geometry, transformation theory, non-Euclidean geometries and the historical development of geometry. Prerequisite: MTH 310 or consent of instructor.

2. MATHEMATICS PROGRAM OBJECTIVES: As an upper division course in the mathematics program, this course will meet the following requirement:

Students will construct and communicate written logical arguments using appropriate mathematical language and terminology.

3. COURSE OBJECTIVES: The primary goal of this course is to give students a firm foundation in Euclidean geometry. Also, this course is intended to serve as an introduction to higher mathematics. This course impresses upon the student the importance of proof in mathematics by illustrating the validity of non-Euclidean geometries. Students' performance in all objectives will be assessed by means of graded assignments and exams.

4. COURSE OUTLINE:

- Section 2.1: An Introduction to Axiomatics and Proof
- Section 2.2: The Role of Examples and Models
- Section 2.3: Incidence Axioms for Geometry
- Section 2.4: Distance Axioms; Segments, Rays, Angles
- Section 2.5: Angle Axioms
- Section 2.6: Plane Separation Axiom; Interior of Angles
- Section 3.1: Triangles, Congruence Relations
- Section 3.2: Taxicab Geometry, Geometry without SAS Congruence
- Section 3.3: SAS, ASA, SSS Congruence
- Section 3.4: Exterior Angle Inequality
- Section 3.5: Inequality Theorems

Section 3.6: Additional Congruence Criteria  
Section 3.8: Circles  
Section 4.1: Euclidean Parallelism  
Section 4.2: Parallelograms and Trapezoids, Parallel Projection  
Section 4.3: Similar Triangles, Pythagorean Theorem, Trigonometry  
Section 4.5: Circle Theorems  
Section 5.1: Plane Transformations  
Section 5.2: Reflections  
Section 5.3: Translations, Rotations, Isometries  
Section 6.2: Introduction to Non-euclidean Geometry  
Section 6.3: Hyperbolic Geometry

5. **EVALUATION:** There will be a total of four tests including a final exam. Each test will be worth 100 points. Also, there will be a homework grade worth 100 points. Thus, there will be a total of 500 attainable points in this class. The grading scale will be as follows:

90-100% A  
80-89% B  
70-79% C  
60-69% D  
0-59% F

Homework will be assigned and graded after almost every class meeting. The percentage of earned points out of the total points will be recorded for each assignment. At the end of the semester, these homework grades will be averaged to get the final 100-point homework grade. This grade will then be averaged with the four test grades to obtain the final grade for the class.

Homework assignments will be collected at the very beginning of class. If homework is not ready to turn in at the beginning of class, it will not be accepted for a grade.

6. **REQUIREMENTS:** The tentative dates for the exams are as follows:

Exam #1: Sep 26  
Exam #2: Oct 19  
Exam #3: Nov 14  
Final: Dec 16 from 8-9:30

7. **ATTENDANCE:** Campbellsville University has an attendance policy which states that a student who misses two weeks worth of a class (for any reason) receives a warning. Thus, any student missing 6 class periods in this class will receive a warning. Any student who misses four weeks worth of a class (for any reason) is automatically withdrawn from the class with a failing grade. Thus, any student missing 12 class periods in this class will be withdrawn from the class. PLEASE NOTE THAT, BY THIS POLICY, ANY ABSENCE COUNTS,

#### WHETHER EXCUSED OR UNEXCUSED.

Attendance will be recorded by me every class period at the beginning of class. If you are late for class, you will be counted as absent. Also, if you leave class early, leave your seat, disrupt class, or distract anyone else in class by talking, you will be counted absent. The actions above show disrespect for others in class and thus will be penalized as noted.

You must notify me in advance if you are going to miss a test. You may contact me by phone or by e-mail. Make-up exams are possible if I am notified in advance and if I think the excuse is reasonable.

8. **CALCULATORS:** Only scientific calculators or graphing calculators will be permitted for use on exams. Cell phones and other such forms of technology are strictly prohibited. It is your responsibility to make sure that you have an acceptable calculator for each exam. Calculators may not be shared under any circumstances.
  
9. **ADDITIONAL SOURCES:**  
Geometry by Hvidsten
  
10. **DISABILITIES:** Disability Statement: Campbellsville University is committed to reasonable accommodations for students who have documented learning and physical disabilities, as well as medical and emotional conditions. If you have a documented disability or condition of this nature, you may be eligible for disability services. Documentation must be from a licensed professional and current in terms of assessment. Please contact the Director of Disability Services at (270) 789-5450 to inquire about services.
  
11. **SECURITY:** Campus Security: Cell Phone: (270) 403-3611; Office: (270) 789-5556

12. TITLE IX STATEMENT: Campbellsville University and its faculty are committed to assuring a safe and productive educational environment for all students. In order to meet this commitment and to comply with Title IX of the Education Amendments of 1972 and guidance from the Office for Civil Rights, the University requires all responsible employees, which includes faculty members, to report incidents of sexual misconduct shared by students to the University's Title IX Coordinator.

Title IX Coordinator:

Terry VanMeter

1 University Drive

UPO Box 944

Administration Office 8A

Phone – 270-789-5016

Email – [twvanmeter@campbellsville.edu](mailto:twvanmeter@campbellsville.edu)

Information regarding the reporting of sexual violence and the resources that are available to victims of sexual violence is set forth at:

[www.campbellsville.edu/titleIX](http://www.campbellsville.edu/titleIX)