Euclidean Geometry
The laws of nature are but the mathematical thoughts of God. - Euclid

2022-2023
T/Th 4:00 EST

Instructor: Dora Ward, nymphodoraward@gmail.com
Office Hours: Please contact me through edmodo or my email with any questions, I want to support your learning and I am flexible.

I. Rationale:

Developing a scientific mind for Mathematics requires proving each rule. The Father of Geometry, Euclid, wrote out systemic proof for hundreds of geometric concepts. This class will explore the plane (2D) geometry section of his work for the fall semester and will explore circles and their geometry for the second semester.

II. Course Aims and Outcomes:

Aims
- Have a rigorous understanding of geometric principles
- Have the confidence to explore and prove other concepts

Specific Learning Outcomes
By the end of this course, students will be able to:
- Describe and prove the aspects of equilateral, isosceles, and unequal triangles
- Prove and apply congruence theorems
- Discover and apply constructions in order to solve more complicated problems

III. Format and Procedures:

This class will practice problem based learning, there will not be a lot of me sitting in front of the camera and talking. You will need to be prepared to work respectfully with others.

Attendance: This class will best serve you if you attend every lesson. However, life happens and there will be times on which you cannot attend. In the event that you are unable to attend a class time, please communicate with me as soon as possible. I will work with you to get you back up to speed for the course of the class. If you cannot attend a class, you are still responsible for the proofs. Classes will be recorded and available for you to watch afterward.

Class participation: This class requires interaction with your peers. For the most part, I will be limiting my own lecturing and instead giving you problems which you will work on with a small

group of classmates. I ask that you have your camera on and be ready for participation during the class. If, for some reason, you are not able to have your camera on, please communicate with me.

IV. My Assumptions

This class is not a SAT/ACT prep course for Geometry, despite its rigor. If you are choosing this class, you must bear in mind that this class is more about depth of understanding than breadth of understanding. This is not to say that you will be unable to complete the SAT or ACT, but there will be other areas you will need to study.

V. Course Requirements:

1. Prerequisites: Students must complete mathematics education through grade 8 level. While basic algebra is not a requirement to be successful in this class, it is highly advised to help build an understanding of more advanced mathematical thinking and work.
2. Course readings and materials:
   (a) Required text: Euclid's Elements, books 1 and 3. It can be found published for free at this link: http://aleph0.clarku.edu/~djoyce/elements/aboutText.html
   (b) Tools of the trade: You will need a straight edge like a ruler, a pencil, and a drawing/drafting compass.
   (c) Online tools: https://www.geogebra.org/geometry?lang=en is an online geometry space where you can explore definitions and I will use it during classes for our more advanced propositions.

VI. Expectations for Parents

- Set aside a calm, quiet, distraction-free space for your child(ren) to work every day.
- Ensure virtual learning equipment is available and charged.
- Establish routines and expectations and a basic schedule for completing classwork.
- Help students 'own' their learning.
- Check Edmodo for communications from teachers and help students print off resources that are provided.
- Stay abreast of teacher feedback in the form of grades or other messages.
- Proctor tests, quizzes, or other assessments as scheduled by the teacher. Parents ensure academic integrity because they are on the "live" side of the screen.
- Communicate with teachers regularly via email or Edmodo regarding any questions or issues that arise.
- If your child is having trouble completing work, email teachers to schedule a time for an online meeting.

VII. Grading Procedures

Grades will be weighted on the following scale:
   A. Class participation (%)
   B. Exams (40%) Each Exam is worth 10% of the grade
   C. quizzes (%)

Keep in mind, as you decide the weighting for the different assignments and tasks you give students it will have a major impact on their effort distribution. For example, if you have many homework assignments and/or quizzes, but not any one of them will count significantly toward the final grade, students may invest less time and commitment to doing them. If a certain percentage of the students' grades are based on class participation, what criteria will be used to make that assessment: quantity or quality? If quality, what determines quality?

VIII. Academic Integrity

Each student in this course is expected to abide by the Cornell University Code of Academic Integrity. Any work submitted by a student in this course for academic credit will be the student's own work. Because we will be collaborating in class, your work will be very similar, but

You are encouraged to study together and to discuss information and concepts covered in lecture and the sections with other students. One great way to assess what you know is to teach the idea to a peer! You may also work together on problem sets and give "consulting" help to or receive "consulting" help from your peers. However, this permissible cooperation should never involve one student having possession of a copy of all or part of work done by someone else, in any form (e.g. email, Word doc, Box file, Google sheet, or a hard copy). Assignments that have been previously submitted in another course may not be submitted for this course.

Should copying occur, both the student who copied work from another student and the student who gave material to be copied will both automatically receive a zero for the assignment. Penalty for violation of this Code can also be extended to include failure of the course and University disciplinary action.

During examinations, you must do your own work. Talking or discussion is not permitted during the examinations, nor may you compare papers, copy from others, or collaborate in any way. Any collaborative behavior during the examinations will result in failure of the exam and may lead to failure of the course and University disciplinary action.

IX. Tentative Course Schedule

[Can be as general or specific as you wish, but should at least list units you plan to cover.]

(May change to accommodate guest presenters & student needs)

Date	In class Materials
August 16	Orientation, syllabus
August 18	Book 1 Definitions
August 23	Book 1 Definitions
August 25	Postulates and Common notions

August 30	Propositions 1 and 2
September 1	Propositions 3 and 4
September 6	Propositions 5 and 6
September 13	Propositions 7 and 8
September 15	Propositions 9 and 10
September 20	Propositions 11 and 12
September 22	Propositions 13 and 14
September 27	Constructions review
September 29	Propositions 15 and 16 and Corollary
October 4	Propositions 17 and 18
October 6	Propositions 19 and 20
October 11	Propositions 21 and 22
October 13	Propositions 23 and 24
October 18	Propositions 25 and 26
October 20	Triangles and constructions Test
October 25	Propositions 27 and 28
October 27	Propositions 29
November 1	Propositions 30 and 31
November 3	Propositions 32 and 33
November 8	Review and quiz
November 10	Proposition 34
November 15	Propositions 35 and 36
November 17	Propositions 37 and 38
November 29	Propositions 39 and 40
December 1	Propositions 41 and 42

December 6	Propositions 43 and 44
December 8	Propositions 45 and 46
December 13	Propositions 47 and 48
December 15	Fall Final

This is the End of the Fall Semester, please have all late work in by this time

Date	In Class Materials
January 10	welcome back, definitions for book 3
January 12	Propositions 1 and 2 and corollary
January 17	Proposition 3 and 4
January 19	Proposition 5 and 6
January 24	Proposition 7
January 26	Proposition 8
January 31	Proposition 9
February 7	Review and quiz
February 9	Proposition 10
February 14	Proposition 11 and 12
February 16	Proposition 13 and 14
February 21	Proposition 15 and 16
February 23	Review and quiz
March 7	Proposition 17
March 9	Proposition 18 and 19
March 14	Review
March 16	Half way test, Elements of Circles
March 21	Propositions 20
March 23	Proposition 21 and 22

March 28	Proposition 23 or 24
March 30	Propositions 25 and 26
April 4	Propositions 27 and 28
April 6	Review and quiz
April 25	Proposition 29 and 30
April 27	Propositions 31 and 32
May 2	Propositions 33 and 34
May 4	Propositions 35 and 36
May 9	Review for Book 1
May 11	Review for books 1 and 3
May 16	Review for book 3
May 18	Spring Final: Cumulative understanding

All Materials must be turned in by May 19. Any work submitted after 11:59 PM on May 19th will not be graded by me.