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CLASS TIMES

Both Sections meet in Roop 212 on MWF. For section 5, 1.25-2.15 ; Section 6, 2.30-3.20.

OFFICE HOURS

MWF 9.25-9.55, MF 11.00-11.45*, W 3.20-4.00* The underlined times have a preference for 103 students. The * indicates that the office hour ends 15 minutes earlier if no one has come.

TEXTS AND MATERIALS

Euclids Elements and *The Bones* both published by Green Lion Press are required. A compass and a straightedge are also required. There will also be a number of articles posted on the course website or handed out in class that are required reading.

THE BIG PICTURE ON EUCLIDS ELEMENTS

Math 103 is a general education class that intends to provide an insight into what mathematics is, what it attempts to accomplish and how mathematicians think.

The Elements, written by Euclid circa 300 B.C., is one of the most influential books in western civilization and till recently was considered a cornerstone of any education worth its salt. It is to mathematics what Plato's Dialogues is to philosophy, what Shakespeare is to the theatre. Like these other great books, we will see that to engage with Euclid is an exercise in both beauty and rigor and that it is a path to appreciate mathematics as both a body of knowledge and as a cultural movement.

As a collection of asides, the class will also seek to partially discuss the nature of classical and modern rhetorical and ethical arguments. We will look at the influence of Euclid on Jefferson and Lincoln and study the founding documents of the United States with a view to Euclid. We will go to great lengths to stress the links and distinctions between reason (the authority of logic) and assumptions (axioms and social contracts) in modern and timely social and political contexts.

THE ROAD MAP.

We will focus especially on Books I and III of *Elements* with selections from Books II, IV, VI, VII, IX, XII and XIII. Highlights will include (but are not limited to) the various theorems on congruency of triangles, the Pythagorean theorem, constructions of regular polygons and polyhedra, prime and perfect numbers, the constant π and many other classical results. We will also jump outside of Euclid to understand impossibilities related to Euclid on topics like irrationality of $\sqrt{2}$, angle trisection and squaring the circle.

There will be regular assignments comprising of readings and some exercises. After a slower pace for the first two weeks, we will go at a pace of three to five propositions per class meeting. Class time will be mostly spent in a seminar-style format with students at the board.

Engagement with the course should be thought of as being similar to one in the humanities in so far as you are very much expected to *come to class with the reading being reflected upon and critiqued.*

EXPECTATIONS AND CONCRETE GOALS.

You will be expected to present mathematical proofs covering select propositions from *Elements*, in a setting ranging from written tests to the full group session.

During your presentations and tests, you'll have to *The Bones* but rarely to *Elements*. In homework and preparing for presentations and tests, you should try to master the reasoning style and arguments of Euclid, which can be difficult at times, especially at first.

Your goal should be to convince me that you actively engaged in thinking about mathematics for about an hour each day, since there will be few scheduled full class meetings. Since some of the ideas and language are difficult, I am not very concerned if you do not master all aspects of each argument. I am interested in you trying to make connections to earlier arguments, and building your reasoning skill. Talking with me and your classmates frequently about the ideas that you encounter will do much to convince me that you are putting in honest effort to master the material. The arguments are laid out in *Elements* but it will require work to turn the proof into something that flows well and easily as you discuss it. Your level of preparation will in large part determine your presentation grade. Since your classmates can help you in presentations, work with them (and me) as you prepare. Dialogue and discussion will help you master the material, and make the class a lot more fun.

CLASS PARTICIPATION + NOSE-POINTS.

Class will be run in a seminar-style where anyone can be called upon to go to the board and explain what they've read and the problems they have thought about since the previous day. Others can help and/or fill in gaps for the person at the board too.

When I tap my nose while looking at you, it means you get a "nose-point" for participation. A decent board solution will get feedback according to the *ASSESSMENT RUBRIC* below but will only be recorded as two nose-points. One nose-point is assigned if you say something that's true and relevant to the discussion. The most points you can get in any day is four.

Class participation carries the sizeable chunk of 25% of the total grade and will be added at the end of the semester.

Word to the wise (and not so-wise) Coming to class without working and thinking hard about the problems and without a first sincere reflection on the assigned reading is a recipe for being completely lost in class (in utilitarian terms, that means spending your semester in that hinterland between course grades D and F) and getting very little out of the course as a whole.

IN CLASS TESTS AND FINAL EXAM.

There will be short in-class tests every other Friday. Each tests will last for somewhere between 15 and 35 minutes. The questions will be taken from the homework and from points raised in class discussion – since these are all topics raised before it means that you will have less time than a standard test.

The first test will be on Friday, 8/29. There are no makeups. but there are especially no makeups for the pre-Thanksgiving test. In addition, there will be one last exam on the last day of class, one that will serve as a taste for the final exam. **The in class tests are worth a total of 45% of the total grade.**

The final exam will be a written exam held during the allotted time for the section on finals week. **The final written exam is worth a total of 30% of the total grade.**

ASSESSMENT RUBRIC

As already stated above 25% of the grade is for class participation, 45% for the fortnightly in-class tests and 30% for the final oral exam. I have the freedom (but not the obligation) to raise a grade if the final exam is especially strong.

Every in class tests will contain questions. Questions will be graded on an **A/B/C/D** scale.

- A:** Excellent and complete solution/argument with the smallest of gaps allowed.
- B:** A decent, close to complete argument that nonetheless would need one major hint to complete or two minor ones. Questions acheiveing this grade should be re-read carefully with the holes filled in.
- C:** Proposed argument contains something that is true and relevant. Can also be given to arguments that have serious errors and are not easily fixed.
- D:** Argument might contain a thread of something that is true and relevant, or be little more than the student's name on the page and/or scribbles.

How to get a sense of your grade from the in-class tests? Almost all questions carry equal weight. Occasionally, some test questions might be weighted more. For example, a challenging and/or necessarily long question might be weight double. To get a sense of your overall grade give yourself 5 for every A, 4 for every B, 3 for every C, 2 for every D, 0 for every missed/absent assignment. Compute your average, being sure to count tests and class days missed. Try to account too for the participation points.

If your cumulative average is 4.5 or above then you are guaranteed an A, equal or above 3.6 but less than 4.5 then you are guaranteed a B, equal or above 2.7 but less than 3.6 is guaranteed a C, and a D is between 2.0 and 2.6. Plus/minus grades will be assigned accordingly.

FIRST WEEK ATTENDANCE POLICY

At the instructor's discretion, any student registered for a class in the Department of Mathematics and Statistics who does not attend at least one of the first two scheduled meetings of the class (or does not attend the first scheduled meeting of a class that meets once a week) MAY be administratively dropped from the class. Students will be notified by e-mail if they will be dropped. Students who fail to attend should not assume they will be administratively dropped by their instructor; it is the students responsibility to drop the course on their own or they will receive a grade at the end of the semester. All students are responsible for verifying the accuracy of their schedules and changes made in their schedules.

GENERAL JMU POLICY

Go to www.jmu.edu/syllabus for university wide policies on Attendance, Academic Honesty and Safe-Assign, Adding/Dropping Courses, Disability Accommodations, Inclement Weather and Religious Accommodations.