

Mathematics 140 – Modern Geometry

Claremont McKenna College, Fall 2010

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Office Hours: **TTh 10:00-11:50am and by appointment**

The text for this course is *A Course in Modern Geometries* (Second edition) by Judith N. Cederberg. Class is from 11:00 to 11:50 AM in RS 105 every Monday, Wednesday and Friday. Regular attendance is encouraged.

Our book includes practice problems at the end of each chapter; you are strongly encouraged to try a few of these problems from each chapter, though they will not be collected for a grade. Merely attending class is not enough; in order to pass this class, you will need to read the assigned sections and work the practice problems on your own. Each day, I will give a lecture explaining the concepts and showing examples from that day's section, which you should have already read; then, before the next class, you should try some of the problems for that day's section and read the next assigned section.

There is no way to learn Geometry without doing the problems and reading the sections in the book. On the other hand, if you do the required reading and problems (and at least a few of the practice problems), pay attention in the lectures, and make sure to ask questions when things don't make sense (my office hours are for **your** questions!), you have every reason to expect success in the course.

Grading will be as follows:

- 30%** - weekly take-home assignments
- 40%** - two midterms
- 30%** - final exam (**Wednesday, December 15 9am-12pm.**)

My grading policy is explained on my website, which you should read carefully. In summary, we will use a 5-point scale for grading problems, designed to ensure uniform and fair grading.

30% of your grade will come from weekly take-home assignments. These will be handed out in class and also posted to my website, in case you need a new copy. We will drop the lowest homework scores when determining the final grade.

The midterms will have around eight problems plus some bonus problems. The final will be cumulative, will have around sixteen problems plus some bonus problems and will be given in RS 105 on Wednesday, December 15 from 9am to 12pm. Before each exam, I will post a practice exam and separate solutions page to the above-listed website. These practice exams can be helpful in identifying weaknesses in your understanding of the material. However, the fact that a certain type of problem does not show up on the practice exam does **not** mean that a problem of that type will not show up on the actual test. In particular, doing the practice exam is not a substitute for working the practice problems throughout the semester.

Since late take-home assignments will not be accepted, we will drop the lowest homework scores. Make-up tests will be permitted only with a valid reason and should be scheduled ahead of time. Calculators are permitted but are neither required nor necessarily helpful – you cannot simply write a number or formula and expect to receive credit, as your grade is based on your *explanation* of your answer, not just the answer itself. Cheating in any form will not be tolerated.

You are encouraged to come to my office hours with any questions or concerns you might have; my office hours are there for you. You can also send me questions through email, at Sam.Nelson@cmc.edu or via AIM/Y!IM/FB at ProfSamNelson or via SMS.

Math 140 Lecture Topics, Fall 2010

L1 Axiomatic systems	L17 Tilings
L2 Finite projective planes	L18 Similarity transformations
L3 Euclidean geometry	L19 Affine transformations
L4 Non-Euclidean geometry	L20 3D tilings
L5 Sensed parallels	L21 Duality
L6 Asymptotic triangles	L22 Perspective triangles
L7 Saccheri quadrilaterals	L23 Harmonic sets
L8 Ultraparallels	L24 Perspectivities and projectivities
L9 Elliptic Geometry	L25 Projective conics
L10 Symmetry	L26 Analytic model for the projective plane
L11 Symmetry II	L27 Cross ratios
L12 Analytic \mathbb{E}^2	L28 Collineations
L13 Transformations of \mathbb{E}^2	L29 Correlations and polarities
L14 Isometries	L30 Subgeometries of projective geometry
L15 Direct Isometries	L31 Dynamical systems
L16 Indirect Isometries	L32 Fractals

Math 140 Approximate Calendar, Fall 2010

September

M	W	F
	1 Intro	3 L1
6 L2	8 L3	10 Break
13 L4	15 L5	17 L6
20 L7	22 L8	24 L9
27 L10	29 L11	

October

M	W	F
		1 L12
4 L13	6 L14	8 L15
11 L16	13 Review	15 Mid 1
18 Break	20 L17	22 L18
25 L19	27 L20	29 L21

November

M	W	F
1 L22	3 L23	5 L24
8 L25	10 L26	12 L27
15 L28	17 L29	19 Review
22 Mid 2	24 Bonus	26 Break
29		

December

M	W	F
	1 L30	3 L31
6 L32	8 Review	10 Review

**Final Exam: Wednesday, December 15th
9am-12pm.**