

## Syllabus

**MAT 551**

Spring, 2012

**Time:** Tuesday and Thursday 2:00pm-3:20pm

**Place:** Room 316, Carnegie

**Description:** Geometry is one branch of mathematics that has many applications in the “real world.” It is also very useful in other areas of mathematics and much of modern mathematics was developed to answer geometric questions. Unfortunately, the amount of time devoted to geometry in present-day curricula (from kindergarten through graduate school) is at an all time low. This course will concentrate on building geometric intuition in 2- and 3-dimensional euclidean space and developing an understanding of two non-euclidean geometries: spherical geometry and projective geometry.

**Co/Prerequisites:** MAT 275 and MAT 331. The course will assume that the students can read and write proofs and have a good understanding of the vector space  $\mathbf{R}^n$  for  $n = 2$  and  $3$ .

**Text:** *Modern Geometry with Applications* by George A. Jennings. We will cover chapters 1, 2 and 4 in depth and the basic ideas in chapters 3.

**Instructor:** Professor Jack E. Graver

**Office:** 229E in the Physics Building

**Office hours:** Will be announced and may change from week to week.

**Extension:** 1576.

**Email:** jegraver@syr.edu.

**The Final Exam:** Tuesday, May 8 from 10:15am to 12:15pm.

ALL STUDENTS MUST take the final exam at this time!

**Grading:** There will be several problem sets and reports, three tests, one or two group projects and a comprehensive (open book - open notebook) final exam. These items will be weighted as follows:

Problem sets, reports and projects:	35%
3 Tests (15% each)	45%
Final Exam*	20%

\*The final exam may be given more weight if it demonstrates improved understanding.

**Equipment:** You will need a pair of compasses and a straight edge for the constructions on the problem sets and the tests. A scientific calculator like the TI84 or TI89 will be very useful.

**Joint Work on Projects and Problem Sets:** Work on the projects will be done by groups, submitting a group report. For the problem sets, you should get help from me or from other students in the class if you get stuck on a problem. However, you must write up your own solutions and include the names of any people that you worked with or consulted.

**Final Grades:** The assignment of the final letter grades will be based on the standard scale:

A	93-100	A-	90-92	B+	87-89	B	83-86	B-	80-82
C+	77-79	C	73-76	C-	70-72	D	60-69	F	0-59

## Tentative Calendar

*Tuesday*                      *Thursday*

<i>Jan.</i>	17	<i>C1</i>	19	<i>C1</i>
	24	<i>C1</i>	26	<i>C1</i>
<i>Jan./Feb.</i>	31	<i>C1</i>	02	<i>C1</i>
	07	<i>C1</i>	09	<i>C1</i>
	14	<i>C1</i>	16	<i>test#1</i>
<i>Feb./Mar.</i>	21	<i>C2</i>	23	<i>C2</i>
	28	<i>C2</i>	01	<i>C2</i>
	06	<i>C2</i>	08	<i>C2</i>
	13	<i>no class</i>	15	<i>no class</i>
	20	<i>C2</i>	22	<i>C2</i>
	27	<i>C2</i>	29	<i>test#2</i>
<i>Apr.</i>	03	<i>C3</i>	05	<i>C3</i>
	10	<i>C4</i>	12	<i>C4</i>
	17	<i>C4</i>	19	<i>C4</i>
	24	<i>C4</i>	26	<i>C4</i>
<i>May</i>	01	<i>test#3</i>		

Final Exam - Tuesday, May 8, 10:15am to 12:15pm.

## Learning Outcomes

- Ability to use and understand the usage of mathematical notation;
- Ability to follow proofs and other mathematical discourse;
- Ability to write simple proofs in the major proof formats (direct, indirect, inductive), and to engage in mathematical discourse;
- Ability to select an appropriate mathematical model for a given real world problem and to apprehend and enunciate the limitations of conclusions drawn from mathematical models;
- Ability to do calculations with the aid of appropriate hardware and/or software;

## How to Succeed:

- It is absolutely essential that you understand how to solve the assigned homework problems and, more importantly, how and why the skills and techniques presented in the course are used in solving the assigned problems. Quiz and exam questions will be similar to these problems.
- Ask questions in lecture, recitation and/or at the clinic about anything that is not completely clear. Don't hesitate to bring questions to your instructors during office hours.
- Every day, read and study the sections in the textbook covered in the lecture. Learning mathematics takes time! Read carefully and work through all the examples in complete detail. It can be helpful to try to work through an example on your own before reading the solution.
- Stay caught up. Mathematical concepts build on each other cumulatively and you need to stay on top of the material at every stage. If you are having difficulty, don't expect that the problem will take care of itself and disappear later. Contact your course instructor or your recitation instructor immediately and discuss the problem!
- Form a study group. Many students benefit from a study group to work through challenging problems and to review for exams. You should attempt the problems ahead of time by yourself and then work through any difficulties with your study partners. Explaining your reasoning to another student can help to clarify your own understanding.

- You should expect to work hard. Don't get discouraged if you find some of the material very difficult. Be persistent and patient! If you follow the above suggestions, your experience in this course will be a rewarding one.

**Getting Help:** Your instructor and recitation instructor will be holding regular office hours and will make appointments with students having class conflicts with their scheduled office hours. In addition, the Mathematics Department offers regular math clinics. These will be set up by the second week of the semester and a schedule of the clinics will be posted outside the math office.

**Cell Phones:** All electronic devices other than the calculator should be turned off and put away during class. Calculators on cell phones are not to be used on tests or quizzes.

**Students with Disabilities:** If you believe that you need accommodations for a disability, please contact the Office of Disability Services (ODS), located in Room 309 of 804 University Ave. <http://disabilityservices.syr.edu> or call (315) 443-4498 for an appointment to discuss your needs and the process for requesting accommodations. ODS is responsible for coordinating disability-related accommodations and will issue students with documented disabilities Accommodation Authorization Letters, as appropriate. Since accommodations may require early planning and generally are not provided retroactively, please contact ODS as soon as possible. You are also welcome to contact me privately to discuss your academic needs although I cannot arrange for disability-related accommodations. Making arrangements with ODS takes time. Do not wait until just before the first test.

**Academic Integrity:** The Syracuse University Academic Integrity Policy holds students accountable for the integrity of the work they submit. Students should be familiar with the Policy and know that it is their responsibility to learn about instructor and general academic expectations with regard to proper citation of sources in written work. The policy also governs the integrity of work submitted in exams and assignments as well as the veracity of signatures on attendance sheets and other verifications of participation in class activities. Serious sanctions can result from academic dishonesty of any sort. For more information and the complete policy, see <http://academicintegrity.syr.edu>