

Syllabus for Math 520, *Modern Geometry*, Summer 2020

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Office: Room 111 **Course Dates:** June 15-July 24

COURSE DESCRIPTION: This course will cover topics from Euclidean and non-Euclidean Geometry. We will use the software Geometry Explorer as a supplement to the text. This software can be installed on Windows, Macintosh or Linux machines. It is understood that the students have as a pre-requisite an in-depth, working knowledge of (high school level) Euclidean geometry. Prior experience with proving mathematical results is highly recommended. The goal of this class is to expose you to new concepts in geometry and to deepen your understanding of basic concepts in Euclidean geometry. This is a proof-based content course where you will broaden your knowledge and hopefully your appreciation of geometry, which should enhance the teaching of your individual curriculum. Topics for this course will include axiomatic geometry, advanced Euclidean geometry, analytic geometry, transformational geometry, non-Euclidean geometry and fractal geometry. We will cover chapters 1, 2, 5, 7 and 10.

TEXT: *Exploring Geometry*, Second Edition by Michael Hvidsten.

ATTENDANCE: This is an online course. There is no campus attendance required. There will be a deadline for turning in each assignment. The schedule is somewhat flexible in that it will be possible for you to turn in assignments early and even finish the class early. However, the deadlines are not flexible, and no late work will be accepted. You must have access to a computer, e-mail, scanner and printer. Assignments must be uploaded to Canvas.

GRADING: The grading will be assigned on a graduate scale: A, A-, B+, B, B-, C, F. A=Excellent, B=Good, C=Poor, F=Fail. Grades will be based on quizzes, computer projects, midterm, and final. Grades, lectures, assignments, announcements and quizzes will be on Canvas canvas.jmu.edu.

PACE: This is a 15 week semester course being taught in 6 weeks. The course will move very quickly. It is not advisable that you are taking other courses or working during this 6 weeks. There will be a “pace” document with a suggested timeline for completing the work. Both a 6 week pace (starting June 15) and an 8 week pace (starting June 1) will be offered. Additionally, there are separate “due dates” with hard deadlines for turning in the work. The pace gives a reasonable time frame for getting everything done on time. You should try to stay on or ahead of the pace for the course. Due date deadlines are slightly later than the pace. If you plan to take some time off in the middle of the course (not recommended!), you will need to get ahead of the pace and turn things in before the due dates.

QUIZZES: Quizzes will be given after every few sections. Each quiz will cover the material since the last quiz. Quizzes are to be taken on Canvas, in the time specified (usually 30 minutes) or less. Quizzes will be open book, but due to the time constraints, you should have a good working knowledge of the material before you take the quiz. You will not have time to spend looking up the answers. The quizzes will be multiple choice, true/false and short answer and will be scored immediately upon completion. All quizzes must be completed by 9pm Eastern Time on the due date.

HONOR CODE: You are to abide by the JMU Honor Code at all times. Please familiarize yourself with the code at this site: <http://www.jmu.edu/honor/code.shtml#TheHonorCode> I will ask you to sign a statement at the beginning of class agreeing to the Honor Code and issues specific to an online course. In particular, you must not share LaTeX code, files containing your project, or any quiz or exam with other students in the class. Do not discuss quizzes or exams with other students until after the due dates.

HOMEWORK: Homework problems will be assigned after each section, but not collected. However, it is extremely important that you do the homework and get help if you do not understand the problems. Exams will be based on both lectures/readings and homework. Solutions to homework problems will NOT be posted. You are welcome and encouraged to type up your answers and send them to me for feedback. You can also post your homework solutions in the discussion section of Canvas to get feedback from your classmates. HOWEVER, the reason I do not post homework solutions to proof problems is because there are MANY correct answers and many different ways of proving the same problem. Also, reading a solution and understanding it is COMPLETELY DIFFERENT from being able to write up a correct solution yourself. If you only look at the solution without trying the problem first, you will become very proficient at reading geometry proofs. But you will not become proficient at DOING geometry proofs. Try all of the homework problems BEFORE looking at any solutions on the discussion boards.

COMPUTER PROJECTS: There will be several computer projects assigned during this course. These projects are designed for you to learn new concepts, solidify concepts covered in the lectures/text, and, in general, to get exposure to learning techniques using geometry software. The software that goes along with the textbook is very similar to other commercially available software packages that you can use in your own classroom. It is available for you to download free of charge from the author's website:

<http://homepages.gac.edu/~hvidsten/gex/index.html> You must write up your reports in either L^AT_EX or another software that allows you to type mathematical symbols and insert diagrams. It is very important that you do NOT share your L^AT_EX or homework files with anyone or post them on Canvas. Your work should be your own. You should upload the PDF of the project to Canvas by the due date. See Assignment page on Canvas for more information.

EXAMS: There will be one midterm exam at the end of week 3 and a final exam at the end of the course. Both will be closed book and proctored. More details on proctoring are found on canvas. You should make arrangements for your proctor as soon as possible and give their contact information to me. Exams will be free response including definitions, short answers and proofs including problems identical to and similar to homework problems. The final exam will be cumulative with greater emphasis on the material since the midterm. Since it may not be possible for you to find a proctor for the exams, I will offer 2 online proctored sessions for the Midterm and 1 for the Final. Dates and times below:

Midterm: Friday, June 26 9am-11am

Midterm: Friday, July 3 9am-11am

Final: Friday, July 24 9am-11am

COMMUNICATION: My communication with you will be through e-mail and Canvas Announcements. You have been assigned a JMU e-mail address that is now listed in Canvas. You can add a different e-mail address by going to "Profile" and "Settings". You can register for text alerts as well. I will send e-mails and announcements through Canvas, so it is very important that you check e-mail often - at least once a day. You can use the discussion section of Canvas to discuss the course with classmates. I will monitor and answer questions there when appropriate. I will hold virtual office hours via WebEx or Zoom once a week and I will make individual appointments as requested. <http://www.jmu.edu/computing/webex/>. You can always ask questions via e-mail at any time.

How to be successful in this class: PDFs of the lectures will be posted on canvas. The lecture notes are a supplement to the text, and, in some cases, contain material that is NOT in the text. The lecture notes tend to be more concise than the text, and emphasize the important concepts. It is recommended that you read the text before the lecture notes. Then go through the lecture notes carefully, writing down definitions and theorems on index cards as you go. At the end of each lecture, there will be homework problems assigned. Refer back to the text or notes as you are working on the homework. In reviewing for a quiz, review your notecards and understand any definitions, theorems and key concepts in the sections and be comfortable with the homework problems. There will be multiple choice questions on definitions and theorems on the quizzes. Be sure to be familiar with the definitions and understand them completely before taking the quizzes (open book). For the exams you will be required to state definitions (closed book). The definitions do not need to be stated word for word as they are in the text and the notes. They just need to be correct and complete.