Geometry
MTG 3212
SPRING 2025

Classroom: LIT237 | **Meeting Times**: MWF5

Instructor: Konstantina Christododoulopoulou | **Office Phone**: (352) 294-2350

Office Location: LIT 365 | **Email**: kchristod@ufl.edu

Office Hours: M7, W8, F4, and by appointment.

Open Door Policy: You are welcome to drop by to discuss any aspect of the course, anytime.

All course materials will be posted in e-Learning Canvas

All course materials will be posted in eLearning Canvas, http://elearning.ufl.edu/.

Text: I will assign readings from *Robin Hartshorne's, Geometry: Euclid and Beyond* and from other standard texts. All readings will be available on canvas or online through the UF Library.

Course Description & Objectives: This course provides an axiomatic treatment of topics in Euclidean and non-Euclidean geometry and is particularly useful for prospective secondary-school mathematics teachers. In addition, this course will enrich the knowledge of all mathematics majors and ease their transition to more advanced mathematics courses. We will build the results of classical geometry from its basic axioms. We will be asking why various theorems in geometry are true, and we will pay particular attention to the use of mathematical reasoning to help us understand the underlying theory.

Office Hours: I encourage you to take advantage of my office hours and my **open door** policy. You are welcome to drop by my office to talk about the course anytime I am in my office and my door is open. In addition, I will hold regular office hours for your convenience. If you cannot make my posted hours I will also be happy to set a meeting time that is convenient for the both of us.

Course Web Page: I will update Canvas regularly with class announcements, homework assignments, and additional materials. All grades are posted in the Canvas gradebook. You are responsible for verifying that those grades are accurate. **You have one week after a score has been posted to contact me to resolve any grade concerns. We will not consider any grading disputes nor make any grade adjustments at the end of the semester.**

Please review the UF Resources and Policies for available technical assistance, resources and UF policies.

Grading:

Problem Sets	25%
Two Semester Exams	50% (25% each)
Final Exam	25%

The following grading scale applies.

A	$\geq 90\%$	C	$\geq 70\%$
A−	$\geq 87\%$	C−	$\geq 67\%$
B+	$\geq 84\%$	D+	$\geq 64\%$
B	$\geq 80\%$	D	$\geq 60\%$
B−	$\geq 77\%$	D−	$\geq 56\%$
C+	$\geq 74\%$	E	$< 56\%$

The current UF grading policies for assigning grade points is available here: `https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/`

Grades will not be rounded and extra assignments for individual students to improve a grade are NOT possible.

Problem Sets: Problem Sets will consist of problems to be submitted for grading and a list of recommended problems. I expect all solutions to be written in full sentences, without logical symbols (such as $\forall, \Leftrightarrow, \exists$ etc.,) and to be grammatically correct. Each solution will be graded on the following scale:

5	Correct mathematical solution and very well written.
4	Small errors such as incomplete sentences, abbreviating words with logical symbols, imprecise definitions, or overlooking trivial cases.
3	Contains an outline of a correct solution and several steps toward this solution, but the writing is unclear or there are gaps in the solution.
2	Some original steps toward a correct solution but with significant mathematical errors.
1	No original steps toward a correct solution.

You may work with your peers to prepare problems but you must write up solutions individually. Do not turn in what are essentially Xerox copies of each other's homework.

Submitted work expectations: Submitted assignments should be neat, organized, and clearly presented. Submissions not meeting these standards may have the scores reduced or may be returned ungraded.

Using the Web: Please refrain from searching for homework solutions on the internet or using someone's notes from a previous semester. Your job in this course is to write proofs in geometry, not learn how to do a web search. Also, you will not have access to the internet on tests. It is very obvious to me when you have a solution that you did not write yourself, and this will not help you succeed in the course. If you are having trouble with a problem ask your instructor or a classmate for help.

Exams: Two semester exams and a final exam are scheduled for this course. The mid-term exams are scheduled for February 12 and March 12, during our regular class and in our regular classroom. The final exam is scheduled for April 29, 3:00pm-5:00 pm in LIT237. **The exams cannot be rescheduled unless you meet the University requirements; see** `https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx` Absolutely no collaboration on exams is allowed.

Make-up policies: Requirements for class attendance and make-up exams, assignments, and other

work in this course are consistent with university policies that can be found at:catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/

Make-up assignments will be allowed in the following cases:

- In case of illness, upon receipt of a doctor's note or equivalent, or by following the procedure outlined here: https://care.dso.ufl.edu/instructor-notifications.
- In case of religious holidays, by informing me via e-mail ahead of time.
- In case of military duty, jury duty, participation in academic conferences, or participation in official university or UAA events, by providing appropriate evidence ahead of time.
- In case of family emergencies or other extenuating circumstances, by following the procedure outlined here: https://care.dso.ufl.edu/instructor-notifications.

In all other cases, or if you are unsure, please e-mail me as soon as feasible. Absences are generally not excused for non-emergency travel and personal schedule conflicts. Students are still responsible for turning assignments in on time unless an extension has been requested via e-mail and approved by the instructor prior to the deadline. In case of true documented emergencies, the instructor may waive this requirement.

Technical difficulties are not generally an excuse for missing an assessment; students should have contingency plans in case any such issues arise.

One-week policy: All grades are posted in the Canvas gradebook. You are responsible for verifying all grades are accurate. You have one week after a score is available to discuss any grade concerns with me. There are no grades dispute after one week.

Incomplete: A student who has completed a major portion of the course with a passing grade but is unable to complete the final exam or other course requirements due to illness or emergency may be granted an incomplete, indicated by a grade of "I". This allows the student to complete the course within the first six weeks of the following semester. You must contact me before finals week to sign an incomplete grade contract (http://clas.ufl.edu/forms/incomplete-grade-contract.pdf), and must provide documentation of the extenuating circumstances preventing you from taking the final exam. The grade of "I" is never used to avoid an undesirable grade, and does not allow a student to redo work already graded or to retake the course. See the official policy at http://www.math.ufl.edu/department/incomplete-grades/.

Attendance and Make-up Policy: Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx and require appropriate documentation.

Students Requiring Accommodation: Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting https://disability.ufl.edu/students/get-started/. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

UF Evaluations Process: Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals.

Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

University Honor Code: UF students are bound by The Honor Pledge which states "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Conduct Code specifies a number of behaviors that are in violation of this code and the possible sanctions. See the UF Conduct Code website for more information: https://sccr.dso.ufl.edu/process/student-conduct-code/. If you have any questions or concerns, please consult with the instructor.

Counseling and Wellness Center: Contact information for the Counseling and Wellness Center: http://www.counseling.ufl.edu/, 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

The Writing Studio: The writing studio is committed to helping University of Florida students meet their academic and professional goals by becoming better writers. Visit the writing studio online at http://writing.ufl.edu/writing-studio/ or in 2215 Turlington Hall for one-on-one consultations and workshops.

In-Class Recordings: Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor. A "class lecture" is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session. Publication without permission of the instructor is prohibited. To "publish" means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third-party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

SPRING 2025 –MTG3212 Calendar

The actual pace of the course may be slightly different than listed in the syllabus below. It will depend on the students' response to the material. **Problem sets will be assigned regularly in Canvas**. Handouts, Lecture Notes, etc. are posted in Canvas. All readings and materials will be accessible online through the UF Library and/or in Canvas. **Please check Canvas regularly for updates.**

	Topics
Week 1	**Euclid's Geometry.** A first look at Euclid's Elements, the axiomatic method, undefined terms.
Week 2	Introduction to logic, theorems and proofs, RAA, ruler and compass constructions, construction of the regular pentagon.
Week 3	Some newer results, misleading diagrams, flaws in Euclid.
Week 4	**Hilbert's Axioms.** Incidence geometry, models.
Week 5	Axioms of betweenness, axioms of congruence.
Week 6	Axioms of continuity, Hilbert's Euclidean Axiom of Parallelism.
Week 7	**Neutral Geometry.** Geometry without the parallel axiom, alternate interior angle theorem, exterior angle theorem.
Week 8	Measure of angles and segments, the Saccheri-Legendre Theorem, quadrilaterals.
Week 9	Parallel postulates revisited, circular inversion.
Week 10	Spring Break/No Class
Week 11	History of the Parallel Postulate, the discovery of non-Euclidean geometry.
Week 12	**Non-Euclidean Geometry.** Non-Euclidean Hilbert planes, the defect, similar triangles.
Week 13	Parallels admitting a common perpendicular, limiting parallel rays, hyperbolic planes.
Week 14	Classification of parallels, independence of the Parallel Postulate, consistency of hyperbolic geometry.
Week 15	The Poincaré model, further topics (time permitting)

Exam 1-Wednesday, February 12, in class.
Exam 2-Wednesday, March 12, in class
Final Exam-Tuesday, April 29, 3:00-5:00PM