



Birzeit Univeristy

Mathematics Department

Second Semester 2022/2023

MATH 339 – EUCLIDEAN AND NON-EUCLIDEAN GEOMETRY

Course Outline

Classes / Instructors / Office Hours:

- **Classes:** Check Ritaj.
- **Instructor:** Dr. Hani Kabajah
- **Office Hours:** Check Ritaj.

Textbooks:

- M. J. Greenberg, **Euclidean and Non-Euclidean Geometries: Development and History**, 4th edition, W. H. Freeman and Company, 2008.
- D. A. Brannan, M. F. Esplen, and J. J. Gray, **Geometry**, Cambridge University Press, 1999.
- D. C. Kay, **College Geometry: A Discovery Approach**, 2nd edition, Addison Wesley Longman, 2001.

Grading Policy:

• Assignments and/or Quizzes	15 %
• Midterm Exam	35 %
• Final Exam	50 %

Dates / Topics of Exams:

- The dates and the topics of the exams will be announced when the reservation system is open. Check Ritaj continuously!

Notes:

- You must attend all lectures.
- You need a scientific calculator for the lectures and the exams.
- **You need Geometric Tools for the lectures and the exams.**
- You are highly encouraged to take notes during the lecture.
- Further notes, material, and information will be posted using Ritaj Course Board. Check Ritaj continuously!

In the following you can find:

- The lectures planned for each topic, where 1 lecture stands for 75 minutes
- **Textbook Exercises (at the end of each chapter) are very useful for practice.**
- **The best way of studying is to solve the questions after each section.**

Topics:

Lecture	Chapter	Title	Textbook
1 – 3	1	Euclid's Geometry	Greenberg
4 – 7	2	Logic and Incidence Geometry	Greenberg
8 – 11	3	Hilbert's Axioms	Greenberg
12 – 15	4	Neutral Geometry	Greenberg
16	5	History of the Parallel Postulate	Greenberg
17 – 19	6	The Discovery of Non-Euclidean Geometry	Greenberg
20	7	Independence of the Parallel Postulate	Greenberg
21 – 24	2	Affine Geometry	Brannan
21 – 24	5	Transformations in Geometry	Kay
25	4	Euclidean Geometry	Kay
25	7	An Introduction to Three-Dimensional Geometry	Kay
26	10	Further Results in Real Hyperbolic Geometry	Greenberg