



**Birzeit Univeristy**  
**Mathematics Department**  
**Second Semester 2021/2022**

**MATH 339 – EUCLIDEAN AND NON-EUCLIDEAN GEOMETRY**  
**Course Outline**

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**Instructors And Office Hours:**

- **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:**

• <b>Homework and/or Quizzes</b>	<b>15 %</b>
• <b>Midterm Exam</b>	<b>35 %</b>
• <b>Final Exam</b>	<b>50 %</b>

**Dates / Topics of Homework and/or Quizzes:**

- **The dates and the topics of the homework and/or quizzes will be announced during the lectures. Don't miss the lectures to stay updated!**

**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 are highly encouraged to take notes during the lecture.**
- **You need a scientific calculator **CASIO fx-95MS** and **Geometric Tools** for the lectures, the exams, the homework and/or quizzes.**
- **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, the detailed topics.
- Textbook Review Exercises and Exercises (at the end of each chapter) are very useful for practice.

**Detailed Topics:**

<b>Lecture</b>	<b>Chapter</b>	<b>Title</b>	<b>Textbook</b>
<b>1 – 3</b>	<b>1</b>	<b>Euclid’s Geometry</b>	<b>Greenberg</b>
<b>4 – 7</b>	<b>2</b>	<b>Logic and Incidence Geometry</b>	<b>Greenberg</b>
<b>8 – 11</b>	<b>3</b>	<b>Hilbert’s Axioms</b>	<b>Greenberg</b>
<b>12 – 15</b>	<b>4</b>	<b>Neutral Geometry</b>	<b>Greenberg</b>
<b>16</b>	<b>5</b>	<b>History of the Parallel Postulate</b>	<b>Greenberg</b>
<b>16 – 18</b>	<b>6</b>	<b>The Discovery of Non-Euclidean Geometry</b>	<b>Greenberg</b>
<b>19</b>	<b>7</b>	<b>Independence of the Parallel Postulate</b>	<b>Greenberg</b>
<b>20 – 23</b>	<b>2</b>	<b>Affine Geometry</b>	<b>Brannan</b>
<b>20 – 23</b>	<b>5</b>	<b>Transformations in Geometry</b>	<b>Kay</b>
<b>23</b>	<b>4</b>	<b>Euclidean Geometry</b>	<b>Kay</b>
<b>23</b>	<b>7</b>	<b>An Introduction to Three-Dimensional Geometry</b>	<b>Kay</b>
<b>24</b>	<b>10</b>	<b>Further Results in Real Hyperbolic Geometry</b>	<b>Greenberg</b>