Outline: The course is for senior undergraduate math students. The main purpose is to provide a rigorous treatment of the foundations of Euclidean geometry and an introduction to hyperbolic geometry (with emphasis on its Euclidean models). General education students are introduced to the history and philosophical implications of discovery of non-Euclidean geometry. Math major students are given, in addition, detailed instruction in transformation geometry and hyperbolic trigonometry.

<table>
<thead>
<tr>
<th>Instr/Tutor</th>
<th>Office</th>
<th>Lecture/Tutorial Hour</th>
<th>Venue</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beifang Chen</td>
<td>Rm3470</td>
<td>L: WF, 1:30pm-2:50pm, Office Hour: W, 3-5pm</td>
<td>Rm1505</td>
</tr>
</tbody>
</table>

Textbook: *Euclidean and Non-Euclidean Geometry*  
by Marvin Jay Greenberg, 3rd edition  
W.H. Freeman and Company 1993

References:  
*Mathematical Thought from Ancient to Modern Times*  
by Morris Kline  
Oxford University Press

*Mathematics: Its Content, Methods and Meaning*  
by A.D. Aleksandrov, A.N. Kolmogorov, M.A. Lavrent'ev  
Dover Publications, Inc.

Homework and exam:  
Homework will be assigned from time to time. We shall have a TA to grade homeworks. There is one midterm and the final.

Grading:  
Homework 20%, midterm 30%, final 50%.

**Tentative Schedule**

- **Week 1-2**: Ch1 Euclid’s Geometry
- **Week 3-4**: Ch2 Logic and Incidence Geometry
- **Week 5-6**: Ch3 Hilbert’s Axioms
- **Week 7-8**: Ch4 Neutral Geometry
- **Week 9-10**: Ch5 History of the Parallel Postulate
- **Week 11-12**: Ch6 The Discovery of Non-Euclidean Geometry
- **Week 13-14**: selections of Ch7 Independence of the Parallel Postulate, and Ch8 Philosophical Implications