Spring 2012-13, Math4221
Euclidean and Non-Euclidean Geometry

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.

Instr/Tutor	Office	Lecture/Tutorial Hour	Venue
Beifang Chen	Rm3470	L: WF, 1:30pm-2:50pm Office Hour: W, 3-5pm	Rm1505

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

Refereces: *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%, miterm 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