

MATH 6118: Non-Euclidean Geometry

Jan 9	Day 1 a) Introduction and History b) Pythagorean Theorem and Euclid's Axioms c) Triangle congruence, parallel lines, Star Trek Lemma
Jan 16	Day 2 a) Similar triangles b) Power of a point c) Centroid, incenter, Heron's formula
Jan 23	Day 3 a) Circumcircle b) Euler line, Nine point circle c) Simson line, Pedal triangle
Jan 30	Day 4 a) Constructions and Algebra of Constructions b) Regular pentagon c) Constructibility and Trisecting an arbitrary angle
Feb 6	Day 5 Geometer's Sketchpad
Feb 13	Day 6 a) Models of Hyperbolic Geometry b) Neutral Geometry c) AAA Congruence
Feb 20	Day 7 a) Classifying parallel lines b) Singly Asymptotic Triangles
Feb 27	Day 8 a) Poincaré Upper Half Plane b) Inversion in a circle
Mar 6	No class UNC Charlotte Mid semester break
Mar 13	Day 9 a) Fractional Linear Transformations b) Cross Ratio
Mar 20	Day 10 Translations, Rotations & Reflections
Mar 27	Day 11 a) Hyperbolic metric b) Area of Triangles
Apr 3	Day 12 a) Poincaré Disk Model b) Circles, hypercycles, and horocycles
Apr 10	Day 13 Hyperbolic trigonometry
Apr 17	Day 14 a) Angle of parallelism b) Curvature
Apr 24	Day 15 Spherical Trigonometry
May 1	Day 16
May 8	Final Exam (date negotiable)