List of Topics

1. First presentation(September 17) :
   - Half-plane model (All)
   - Hyperbolic length and hyperbolic lines in the half-plane([A], [CFKP], [W])
   - Poincaré disc model (All but [K])
   - Hyperbolic length and hyperbolic lines in the Poincaré disc ([A], [CFKP],[W, Section 6])
   - Hyperboloid model ([BP],[CFKP])
   - Hyperbolic length in the hyperboloid model ([BP],[CFKP])
   - Connection among these models.
   - Hyperbolic distance ([A], [W, Section 2])
   - Optional : Other models

2. Second presentation(September 24)
   - Möbius transformation on the half-plane(All but [CFKP])
   - Möbius transformations form a group([A],[S],[W])
   - Möbius transformation is an isometry ([A],[S],[W])
   - Möbius transformation on the Poincaré disc ([A],[S],[W])
   - Transitivity of Möbius transformation ([A, Chapter 2],[S], [W])
   - Möbius transformation maps any hyperbolic lines to any hyperbolic lines ([A],[S],[W])
   - Geodesic = Hyperbolic line ([A],[S], [W])
   - Euclid's parallel postulate fails

3. Third presentation(October 8)
   - Formula for hyperbolic distance in half-plane([A], [S], [W])
   - Formula for hyperbolic distance in Poincaré disc ([A], [S],[W])
   - Möbius transformation = Isometry of hyperbolic plane ([A, Section 3.6],[S])
   - Conformality of Möbius transformation ([A],[S], [W])
   - Pythagoras' theorem for hyperbolic space ([A], [S],[W])
   - Optional : Hyperbolic trigonometry ([A],[S],[W])

4. Fourth presentation(October 15)
   - Hyperbolic area ([A],[S],[W])
   - Möbius transformation preserves hyperbolic area([A], [S], [W])

- Classification of Möbius transformation with the number of fixed points(All but [BP], [CFKP])
- Classification of Möbius transformation with trace (All but [BP],[CFKP])
- Conjugacy([A],[S],[W])
- Every Möbius transformation on the hyperbolic plane is conjugate to either a translation, a dilation in the half-plane model or a rotation in the Poincare disc model.([W])