The course will cover various foundational topics in geometry and topology, emphasizing on dimensions 2 and 4. Depending on the pace of the course and students’ interests/participation, we might get to discuss topics such as complex curves and surfaces, sheaf theory, Hodge theory, intersection theory, vector/line bundles, Riemann-Roch theorem, blowup and other surgeries, Kodaira embedding theorem, classification of 4-manifolds, etc.

The course has no main reference. However, many of these subjects are covered to some extent in “Principles of Algebraic Geometry, Griffiths and Harris.”

Pre-requisites: You should be comfortable with manifolds, vector bundles, differential forms, complex analysis, singular and De Rham homology/cohomology, chain complexes, etc.