

Differential Geometry

Math 440

Course offered by: Prof. Hassan Azad

Level: Introductory

Semester: 032

Introduction:

Differential geometry studies geometries of various types by means of calculus. It is very helpful in understanding relativity, Hamiltonian and quantum mechanics. It is also useful in studies related to computer graphics. The course will concentrate on making you familiar with the language and computational aspects.

Course Outline:

Curves in Euclidean space: Arc length, tangent normal and binormal vectors; curvature and torsion, Frenet formulae. Geometry of surfaces: the first and second fundamental form, geodesics, Gaussian and mean curvature; fundamental theorem of Gauss. Introduction to the non Euclidean geometries of the sphere and the unit disc.