Mathematics 5540H
Honors Differential Geometry
Spring (even numbered years)
5 credits

Catalog Description:
Geometry of curves and surfaces in 3-dimensional space, curvature, geodesics, Gauss-Bonnet Theorem, Riemannian metrics.

Prerequisite:
C or better in 5520H, or in both 2182H and 2568; or credit for 520H, or in both 263.01H and 568; or permission of department.

Text:
Text vary, for example:

- *Differential Geometry of Curves and Surfaces*, DoCarmo
- *Elements of Differential Geometry*, R. Milman and G. Rarker

Topics List:

1. Geometry of curves; Frenet-Serret equations.
2. Curvature of surfaces, First Fundamental Form, Gauss's Theorema Egregium.
3. Geodesics, exponential map.
4. Isometries, conformal mappings; mapmaking.
5. Gauss-Bonnet Theorem.
6. Riemannian metrics, non-Euclidean geometry.