Differential Geometry of Curves and Surfaces in R^3

Lect. 1: (Local Theory of Curves in R^2 and R^3) Curvature, Torsion, Frenet-Serre theory, Fundamental existence and uniqueness theorems.

Lect. 2: (Global theory of plane curves) Rotation index, Convex curves, Isoperimetric inequality, Four vertex theorem.

Lect. 3: (Local theory of surfaces in R^3) First fundamental form and arc length, Second fundamental form and Weingarten map, Principal, Mean and Gaussian curvatures, Theorema Egregium .

References:

1. RS Millman and GD Parker, *Elements of Differential Geometry,* Prentice-Hall Inc, Englewood Cliffs, New Jersey 07632.
2. J McCleary, G*eometry from a Differentiable Viewpoint*, Cambridge University Press.
3. A Pressley, *Elementary Differential Geometry,* Springer Undergraduate Mathematics Series, Springer International Edition.