MATHEMATICS 138A

INTRODUCTION TO DIFFERENTIAL GEOMETRY I

Text: *Differential Geometry of Curves and Surfaces*, by M. Do Carmo

Topics covered include the elementary theory of curves and surfaces, and the first and second fundamental forms.

TOPICS	SUGGESTED NO. OF WEEKS' COVERAGE
Curves (§§ 1.1–1.7, 5.7)	$2\frac{1}{2}$
Regular surfaces (§§ 2.1–2.8)	2
The Gauss map and the second fundamental form (§§ 3.1–3.5, 4.1–4.3)	4

Curves .... $2\frac{1}{2}$
(§§ 1.1–1.7, 5.7)

> Frenet's trihedron and the fundamental theorm of the local theory of curves, isoperimetric inequality, Fenchel's theorem and the Fary-Milnor theorem (optional).

Regular surfaces 2
(§§ 2.1–2.8)

> Regular surfaces and their first fundamental forms, tangent planes, areas, orientations.

The Gauss map and the second fundamental form 4
(§§ 3.1–3.5, 4.1–4.3)

> The Gauss map, the second fundamental form, Gaussian curvature, equations of compatibility and the statement of the fundamental theorm of the local theory of surfaces, minimal surfaces, mean curvature and the first variational formula for area.