

# MATHEMATICS 138A

## INTRODUCTION TO DIFFERENTIAL GEOMETRY I

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

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

TOPICS	SUGGESTED NO. OF WEEKS' COVERAGE
Curves ..... 2 (§§ 1.1–1.5, 1.7A)  Frenet's trihedron and the fundamental theorem of the local theory of curves, isoperimetric inequality.	
Regular surfaces ..... 3 (§§ 2.1–2.6)  Regular surfaces and their first fundamental forms, tangent planes, areas, orientations.	
The Gauss map and the second fundamental form ..... 4 (§§ 3.1–3.3, 3.5)  The Gauss map, the second fundamental form, Gaussian curvature, ruled surfaces, minimal surfaces, mean curvature, extrinsic local surfaces theory.	

Midterm 30%, Final 50%, Homework 20%.