

東海大學九十三學年度上學期數學系幾何學課程教學內容

科目名稱：幾何學

選課代號：0812

任課教師：陳文豪

學分數：3-0

課本： Elementary Differential Geometry

作者： Andrew Pressley

涵蓋內容：93年(上)

幾何學發展史簡介

1.1 What is a Curve?

1.2 Arc-Length

1.3 Reparametrization

2.1 Curvature

2.2 Plane Curves

2.3 Space Curves

3.1 Simple Closed Curves

3.2 The Isoperimetric Inequality

3.3 The Four Vertex Theorem

4.1 What is a Surface?

4.2 Smooth Surfaces

4.3 Tangents, Normals and Orientability

4.4 Examples of Surfaces

4.5 Quadric Surfaces

5.1 Lengths of Curves on Surfaces

5.2 Isometries of Surfaces

5.4 Surface Area

6.1 The Second Fundamental Form

6.3 The Normal and Principal Curvatures

7.1 The Gaussian and Mean Curvatures

7.2 The Pseudosphere

7.3 Flat Surfaces

7.5 Gaussian Curvature of Compact Surfaces

7.6 The Gauss Map

8.1 Definitions and Basic Properties

8.2 Geodesic Equations

8.3 Geodesics on Surfaces of Revolution

8.4 Geodesics as Shortest Paths

10.1 Gauss's Remarkable Theorem

10.2 Isometries of Surfaces

10.4 Compact Surfaces of Constant Gaussian Curvatures

11.1 Gauss-Bonnet for Simple Closed Curves

11.2 Gauss-Bonnet for Curvilinear Polygons

11.3 Gauss-Bonnet for Compact Surfaces