

**DEPARTMENT OF MATHEMATICS
SYLLABUS**

Course # & Name: 119B: Ordinary Differential Equations

Recommended Text(s) & Price: S. H. Strogatz, Nonlinear Dynamics and Chaos, 1st Edition, ISBN-10: 0738204536, (\$49.00)

Prepared by: A. Schwarz UPC Approval Date: Jan. 2003

| Lecture(s) | Sections | Comments/Topics |
|-------------------|-------------------|--|
| | Lorentz equations | Phase space analysis; general properties; bifurcation; Lorenz map |
| | 1-d maps | Phase space analysis: iterative diagram, fixed points & stability; unimodal maps: numerics & analysis; period-doubling bifurcation; Lyapunov exponent; Sarkovskii theorem: period three implies chaos; chaos & symbolic dynamics |
| | Fractals | Cantor set, Sierpinski triangle and Koch snowflake; contraction mapping theorem; iterative function systems; algorithms of generating fractals; fractal dimension |