

Math 420 (Spring 2003) Schedule:

1/27	(1)	Introduction.
1/29		Fences and Funnels.
2/3		Isoclines. Funnel and anti-funnel theorems.
2/5		Vertical asymptotes.
2/10	(2)	Existence and uniqueness of solutions.
2/12		” ”
2/17		Second order equations and linear systems.
2/19		Linear systems; special cases.
2/24		Non-homogeneous systems.
2/26		Prelim 1.
3/2	(3)	The equations of planetary motion.
3/4		” ”
3/9		” ”
3/11		” ”
3/16		Non-linear systems. The phase space.
3/18	(4)	Analysis of critical points.
3/23		Spring break.
3/25		” ”
3/30		Predator-prey equation.
4/1		Van der Pol equation. Cycles.
4/6		Poincaré-Bendixson Theorem.
4/8		Prelim2.
4/13	(5)	Proof of the Poincaré-Bendixson Theorem. Chaos.
4/15		Chaos.
4/20		Bifurcation theory.
4/22		” ”
4/27		” ”
4/29		PDEs. The wave equation.
5/4		” ”
5/6		” ”
5/11		Study period.
5/13		” ”
5/19		FINAL EXAM

Scheduled Projects:

- (1) *Differential equations exercises.* Due 2/4.
- (2) *Existence and uniqueness.* Due 2/18.
- (3) *The solar system.* Due 3/10.
- (4) *Classification of critical points and cycles.* Due 3/31.
- (5) *Chaos and bifurcations around us.* Due 4/28.