

## Math 204 (Differential Equations) – Spring 2007

## Syllabus

**Instructor:** Jeff Tecosky-Feldman, [jtecosky@haverford.edu](mailto:jtecosky@haverford.edu)

**Office:** Hilles 207E (down a half-floor from the main math dept space), 610-896-1199

**Office Hours:** Mondays, Wednesdays and Fridays 4-5, Tuesdays and Thursdays 1-2 and by appointment.

**Class meetings:** MWF 3-4 PM, Koshland E309. On some days, we will meet in Hilles 012 for computer lab – you will receive a schedule indicating these days.

**Math Question Center:** Sun-Thu 7-9 PM. optional time to gather in Hilles 011 to discuss upcoming homework problems with other students and get assistance from a faculty member or upperclass math major on duty.

**Text:** “Differential Equations (3rd ed)”, Blanchard, Devaney, and Hall, (Brooks/Cole, 2006); if you purchase the text used, be sure to get the THIRD ed.

**Homework:** Problem sets most weeks, due on Weds at 5pm; roughly half of the HW will involve some computer work. Solutions will be posted on the Web after HW is returned in class.

**Late homework:** Late homework will not be graded, unless prior arrangements have been made. Some late homework may receive a 20% grade penalty.

**Tests:** There will be two midterms: each will have an in-class, closed-book part and an open book, takehome part. There will be a self-scheduled final during final exam period.

**Grades:**

Homework :	20%
Midterms (2):	20% each
Final:	40%

**Honor Code:** For homework problems, discussion with other students in the class or with me is highly encouraged, e.g., in Math Question Center, my office, or elsewhere. Please indicate on your homework who your collaborators were. *Please see <http://www.haverford.edu/math/collaboration.html> for discussion of appropriate modes of collaboration on homework. The short version is that the actual writing of the assignment should be done individually, without using detailed notes from your collaborative discussions, so that it represents your personal understanding of the problems.* (For computer homework, you will submit a joint assignment as a group of two). For the midterms and final, no collaboration is allowed. You may ask me for clarification of the questions on tests, but I will not give suggestions about the actual solutions.

**Blackboard:** Our course will have a page in Blackboard, which will have copies of handouts, HW assignments, and HW/exam solutions.

## Anticipated Syllabus

Week	Material (with corresponding text sections)
1	Modeling via Differential Equations, Separable 1st-order ODEs (1.1, 1.2)
2	Slope Fields, Euler's Method, Existence and Uniqueness (1.3–1.5)
3	The Phase line, Bifurcations (1.6–1.7)
4	Linear 1st-order ODEs, Integrating Factors, Modeling via 1st-order systems (1.8, 1.9, 2.1)
5	Vector fields and phase portraits, Analytic techniques for special systems, Euler's Method for systems (2.2–2.4)
6	Linear systems, intro to linear algebra, Eigenvalues/eigenvectors (3.1, 3.2)
7	Solving linear systems (3.3–3.4)
8	Spring Break
9	Repeated or zero eigenvalues, Bifurcations in linear systems, damped and undamped oscillators (3.5–3.7)
11	Forced Harmonic Oscillators, Nonlinear systems (4.1–4.3, 5.1)
12	Linearization, nullclines, Hamiltonian system (5.2–5.3)
13	Dissipative systems, systems in 3 dimensions (5.4, 5.5)
14	Periodic forcing and chaos (5.6)
15	Discrete dynamical systems, fixed points, periodic points (8.1–8.2)

Students who think they may need accommodations in this course because of the impact of a disability are encouraged to meet with me privately early in the semester. Students should also contact Rick Webb, Coordinator, Office of Disabilities Services ([rwebb@haverford.edu](mailto:rwebb@haverford.edu), 610-896-1290) to verify their eligibility for reasonable accommodations as soon as possible. Early contact will help to avoid unnecessary inconvenience and delays.