Math 330  Advanced Ordinary Differential Equations

TTh 3:30pm - 4:45pm, Votey 254

Textbook: Nonlinear Dynamics and Chaos, by Steven Strogatz

Instructor: Prof. Jianke Yang
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Office hours: TTh 1:00-2:00pm. Additional time by appointment.

Homework: homework problems will be given on irregular basis.
    Computers will be used for some of the problems.

Exams: No. But a final-term project will be assigned.

Grading: homework: 50%; project: 50%

Topics:

1. Linear Equations: Homogeneous and inhomogeneous equations; second-order linear
   equations; linear equations with constant coefficients; linear equations with periodic
   coefficients; Floquet theory (∼ two weeks).

2. Plane Autonomous Systems: Linear systems; nonlinear systems; critical points; limit
   cycles; Van der Pol equation (∼ three weeks)

3. Weakly Nonlinear Oscillations (∼ two weeks)

4. Bifurcation Theory (∼ two weeks)

5. Lorenz Equations, Chaos, Strange Attractors and Fractals (∼ three weeks)