Course summary: This course will consist of three parts. Part 1 will provide the background in Linear Algebra: vector spaces and norms, orthogonal projections and bases, $QR$ decomposition, condition number, diagonalization, Shur decomposition, singular value decomposition, least squares, quadratic forms. Part 2 will show how methods of Linear Algebra allow one to obtain the solution of $\frac{dg(t)}{dt} = A \, g(t) + g(t)$. This material is covered in Ch. 4–10 of Noble and Daniel. Part 3 will cover fundamentals of qualitative analysis of nonlinear ordinary differential equations: phase portrait of a two-dimensional dynamical system, linearization near the equilibrium, classification of equilibrium points, classification of bifurcation types. This material is covered in Ch. 5–8 of Strogatz.

Homework: Homework will be assigned weekly. Your solutions should be neatly prepared and must be submitted by the due date. An assignment submitted on the due date but later than at the end of class will be graded out of 80%; an assignment submitted no later than on the 3rd calendar day after the due date will be graded out of 50%; any assignment submitted later than that will be given a score of 0. Exceptions from this policy will be made only in exceptional cases and on individual basis.

You are encouraged to seek my help during the office hours and/or work with other students. However, the assignment you submit must be written entirely on your own without consulting or using any outside source. Violations of this rule will be considered academic cheating and dealt with accordingly. Both the person(s) who copied other person’s work and the person whose work was copied will be given the same penalty.

Tests: There will be two tests during the semester, in October and in November. The exact dates will be announced in class at least one week before each test. Make-up exams will be given only to those students who have documented excused absence.

The final exam will be on Thursday, December 18, at 3:30–6:30 p.m. in 361 Votey.

Grading Policy: Each of the two mid-term tests will be worth 22% of the final grade. All homework assignments combined will be worth 30% of the final grade. The final exam will be worth 26% of the final grade. PLEASE NOTE: I do NOT drop your lowest grade. Thus, ALL the grades that you earn during the semester will contribute to your final grade, as detailed above.

Academic integrity: You are expected to read and understand the UVM Academic Honesty policy, found at http://www.uvm.edu/~uvmppg/ppg/student/acadintegrity.pdf.

Special accommodation: Students with disabilities who require special accommodation must notify the instructor of their needs within the first two weeks of the semester. They must also provide a formal letter from the Office of Specialized Student Services.