Instructor: Professor Ian Knowles, Room CH481A, iknowles@uab.edu, (205) 934-2154.
Office Hours: TuTh 10am-noon; you may also email/call for an appointment.
Class Meetings: TuTh: 12:30-1:45pm, Room HB234.
Important Dates. First day of classes is Monday January 7, and the last day of classes is Friday April 19. Martin Luther King Jr. Holiday: Monday January 21. Spring Break: Monday March 11 through Sunday March 17.
Text: A Second Course in Elementary Differential Equations, P. Waltman, Dover, 2004
Mid-terms. There will be two such tests, the first near Thursday, February 14, and the second near Thursday, April 11.
Final Examination: Thursday April 25, 2019, 10:45am-1:15pm; room to be announced. The final examination is comprehensive.
Homework: Regular graded homework assignments will be handed out, typically on Tuesdays, throughout the semester, and due one week later. Late submissions will be graded for correctness, but will not count toward the course score. Feel free to consult with me on any of the homework problems.
Grading Policy. Mid-terms: 20% each; Homework Assignments: 30% total; Final: 30%.
Course Description: We study three basic topics in the elementary theory of ordinary differential equations, from the first three chapters of the textbook. In the first chapter, covering §1-8, we systematically study the solutions of systems of linear equations, including formulae for the general solutions of these systems. The second topic, taken from Chapter Two §1-7, deals with the asymptotic behavior of solutions of two-dimensional autonomous systems, including phase planes, critical points, Lyapunov stability, and limit cycles. In Chapter Three §1-5, we learn some basic existence theory for solutions of initial value problems, using the contraction mapping theorem. If time permits, we may also study, from Chapter Four, some linear boundary value problems that lead us the beginnings of Sturm-Liouville theory and eigenfunction expansions. The course begins with a review of some basic linear algebra (matrix theory) which is useful throughout.