Instructor: Dr. David S. Gilliam, Math 103, Phone: 742-1400
Office Hours: 10:00-11:00 AM TT, 3:30-4:30 PM TTh and by appointment
Textbook: Course notes will be handed out and suggested reading will accompany the notes.

Math 5310

Notation/Functional Analytic Methods
(a) Function spaces, norms, and some topological considerations
(b) Fixed points, successive approximations, contraction mappings

Ordinary Differential Equations/Integral Curves of Vector Fields
(a) Explicit Methods for ordinary differential equations (algorithms and computer algebra systems)
(b) Initial value problems
(c) Systems of linear equations (linear algebra and matrices)

Boundary Value Problems/Sturm-Liouville Theory
(a) Sturm oscillation and separation
(b) Sturm-Liouville eigenvalue problems and Green’s function
(c) Generalized Fourier expansions
(d) Separation of variables (solution of heat, wave and Laplace equations)

Math 5311 (Brief Outline)

Asymptotic, Variational, Optimization, and Perturbation Methods
(a) Integral equations and operators
(b) Variational principles
(c) Methods of Rayleigh, Ritz, Weinstein, and Aronszajn
(d) Optimization methods; Hilbert space methods
(e) Asymptotic analysis
(f) Regular and singular perturbation methods

Grade Policy:
There will be several in-class short quizzes that will account for 1/3 of the grade. In addition there will be 2 in-class exams that will count 1/3 of the grade. Homework assignments will count an additional 1/3 of the grade. A final take-home exam will serve as a single make-up exam that can be used to replace 1/3 of your grade (i.e., it can replace one of your three scores).

Important Dates: September 4, Monday Labor Day. University holiday; October 9, Monday Last day to declare pass-fail intentions. Last day to drop a course and receive an automatic W; November 22-26, Wednesday-Sunday, Thanksgiving holiday; December 1, Friday, Last day to drop a course with “wp” with the instructors permission (if you are passing the class) or “wf”; December 6, Wednesday, Last day of classes; Final: Saturday 9, from 7:30 a.m. to 10:00 a.m..

ADA Accommodations and Religious Observance: Any student who, because of a disability, may require special arrangements in order to meet course requirements should contact me as soon as possible to make necessary arrangements. The instructor may request verification of need from the Dean of Students Office. A student who must miss an exam due to observance of a religious holy day must notify the instructor in advance of all such dates no later than the 15th day after the first day of class.