Methods of Applied Mathematics 1 (MAP 5165)

Syllabus, Fall 2020

W,F 1:25–2:15 Zoom

Professor: Prof. Richard Bertram
Office Hour: by appointment
Office: Zoom
E-mail: bertram@math.fsu.edu

Prerequisite: A course in linear algebra and a course in ordinary differential equations

Text: The course lectures are based mostly on three books. One, by Steve Strogatz, emphasizes a geometrical viewpoint to dynamical systems. The second, by Phil Drazin, has an algebraic viewpoint. The third, by Ali Nayfeh, covers perturbation techniques. The titles of the books are:

Nonlinear Dynamics and Chaos, by Steven H. Strogatz, 1994 or the second edition published in 2014


Course Topics: Linear and nonlinear difference equations, linear and nonlinear planar differential equations, dynamics in higher-dimensions, perturbation methods for algebraic and differential equations.

Course Objective: Most useful mathematical models are nonlinear. For this reason, the model equations can’t be solved analytically and other methods must be used. The objective of this course is for participants to gain mastery of these techniques and to develop conceptual understanding of fundamental concepts of dynamical systems.

The Virtual Environment: This course will be done in an asynchronous virtual environment. Every Friday I will upload video lectures for the next week onto my web site
You should watch each of these in a timely manner. Then on Wednesday and Friday we will hold class as Zoom sessions, where you will have the opportunity to ask questions about the lectures. These class meetings will use Zoom on FSU Canvas. If you want to participate, then please attend starting at the beginning, since if I am the only one in the Zoom room I will end the meeting after 5 min or so. These meetings also act as office hours, so I won’t hold additional office hours (but you are always welcome to email me). I won’t be in my office at the Love building during the pandemic.

**Assignments:** I will give assignments at approximately 2-week intervals. You will have a week to complete each assignment, and must turn them in on time. I will not accept late assignments, except in the case of medical issues (please let me know as soon as possible about any medical situation that makes it impossible to complete your work). You are expected to do your own work on these, and not collaborate with other students. It is okay to talk to others about the material, but not about the specific problems in the assignments.

**Grading:** The course grade will depend entirely on assignment grades. The final letter grade is determined according to the following scale:

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\begin{align*}
90.1-100\% &= A, \\
84.1-87.9\% &= B^+, \\
80.1-84\% &= B, \\
74.1-77.9\% &= C^+, \\
70.1-74\% &= C, \\
58-66\% &= D, \\
0-57.9\% &= F
\end{align*}
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**Academic Honor Policy:** The Florida State University Academic Honor Policy outlines the University’s expectations for the integrity of students’ academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process. Students are responsible for reading the Academic Honor Policy and for living up to their pledge to “...be honest and truthful and...[to] strive for personal and institutional integrity at Florida State University.” (Florida State University Academic Honor Policy found at http://fda.fsu.edu/Academics/Academic-Honor-Policy.)