

Loyola University Maryland
Department of Mathematics and Statistics
MATH 428 (Computational Mathematics)
MWF 9:00AM-9:50AM, KH 305

Instructor: Dr. Prince Chidyagwai
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Office Hours: MW 2:00 - 3:30 PM, or by appointment

Textbook: *A Friendly Introduction to Numerical Analysis*, by Brian Bradie.

Prerequisites: MA 304 (Ordinary Differential Equations) and MA 351 (Calculus III) and a willingness to continue learning MATLAB.

Course Description: This course will emphasize the development of computational techniques that provide stable and efficient solutions to various mathematical problems in science and engineering.

Course Objectives:

1. Provide an overview of various computational tools and increase the ability to use proper tools for a given situation.
2. Improve the ability to work independently to formulate algorithms and implement them using MATLAB.
3. Provide computational experiences that can be utilized in other courses and beyond the classroom.

Topics: We will cover the following topics:

Numerical Differentiation and Integration, Initial Value Problems of Ordinary Differential Equations (ODEs), Two-Point Boundary Value Problems, Partial Differential Equations – poisson equation, diffusion equation, advection equation.

Exams: There will be two in-class exams and a final exam.

Grading: Quizzes - 10%, Homework - 30%, Semester Exams - 30%, Final Project - 10%, Final Exam - 20%. Final grades will be determined according to the following scale:

93-100: A	90-92: A-	87-89: B+
83-86: B	80-82: B-	77-79: C+
73-76: C	70-72: C-	68-69: D+
65-67: D	63-64: D-	0-62: F

Class participation and improving performance on the exams will be considered when assigning borderline grades.

Homework: Homework will be assigned almost weekly in class and posted also posted on the course website. Answers without any justifications are not acceptable. All work must include a detailed description of your solution technique for theoretical problems and a printout of your code and results for the computational problems.

Quizzes: There will be regular inclass short inclass quizzes, announcements will be made in class and posted on the course website.

Final Course Projects: Each student will be assigned a research paper that uses a specific computational method from the topics we will cover during the course of the semester. You will then prepare a 20 minute presentation on how the method is used in the research paper and the results obtained to the class. I will provide several papers for you to choose from. You are also welcome to suggest to me topics that you may be interested in.

Academic Integrity and Standards of Conduct: The guidelines of academic integrity and standards of conduct are presented in the Undergraduate catalogue. The Loyola University Honor Code states that all students of the Loyola community have been equally entrusted by their peers to conduct themselves honestly on all academic assignments. In this class you may work with your peers on assigned homework. However, you should write up submissions by yourself. You may not consult your books or notes for quizzes and exams. Please refer to the Community Standards Handbook for more information and further clarification of the honor code standards, type of violations, adjudication process, and sanctions that may be imposed for violations.

Extra Help: Do not hesitate to come to my office during office hours or by appointment to discuss a homework problem or any aspect of the course.

Important Dates:

Add/Drop Deadline	Thursday, September 3
Withdrawal Deadline	Monday, November 9
Exam 1	Friday, October 2 (in class)
Exam 2	Friday, November 6 (in class)
Final Exam	Friday, December 11, 1:00 PM

Student Athletes: Please provide me with your athletic travel letters indicating when you will not be able to make it to class due to athletic commitments. You will be required to make up any assignments or exams that you miss.

Learning Disabilities: Any student with a disability documented with the Disability Support Service Office (DSS) requiring accommodations in this course is encouraged to contact me as soon as possible. If you have a disability that has not yet been documented, please contact the DSS Office (410-617-2602) for assistance.