HAMPDEN-SYDNEY COLLEGE

Math 342: Numerical Analysis (3 credits)
Spring 2026

Instructor	Brian Lins
Email Address	blins@hsc.edu
Course Meeting Time	MWF 12:30 - 1:20pm
Course Meeting Location	Pauley 100
Office Hours	MWF 10:30 - 11:30am & W 2:30 - 4:00pm See the course website: `https://bclins.github.io`
Required Textbook	None

Course Description

This course will focus on the big ideas and problems in numerical analysis, including error analysis, root finding methods, systems of equations, matrix decompositions (including LU, QR, and the singular value decomposition), orthogonal functions, numerical integration, and solving differential equations.

Course Learning Objectives

- Students will be implement a variety of numerical algorithms using a computer.
- Students will analyze the accuracy and stability of numerical methods.
- Students will be able to choose appropriate numerical methods to solve a wide variety of problems.

Required Materials

None.

Attendance Policy

Attendance in this class is required. Repeated absences may result in a forced withdrawal from the course. You are responsible for any material you miss due to absence. Please let me know ahead of time if you know that you will not be able to attend class.

Grading Policy

The term grade will be based on the following factors.

Component	Proportion
Workshops	40 %
Midterm 1	15 %
Midterm 2	15 %
Final Exam	30 %

Workshops

Most weeks we will have one or more in-class workshops. We will use the Python programming language for many of these workshops, and will use Google Colab for convenient access to Python. If you already have Python installed on your laptop, then you can use that instead of Google Colab.

We will do (or at least start) each workshops in class. Any in-class work that you do not finish will become homework that you will need to complete before the next class period.

Exams

There will be two in-class midterm exams and a cumulative final. These exams will be announced in advance, and you will know exactly what concepts will be covered on each exam.

Course Schedule

The schedule below is tentative, and may be subject to change. Changes will be announced in class, and you are responsible for knowing about any changes even if you miss the class when they are announced.

Week	Topic
1	Floating point numbers
2	Taylor series
3	Bisection & Newton's method
4	Secant method, fixed point iteration
5	Systems of nonlinear equations
6	LU decomposition **Midterm 1**
7	Norms and inner-products
8	Gram-Schmidt algorithm
9	Least squares problems and orthogonality
10	Fourier series
11	Numerical integration
12	Numerical differentiation, **Midterm 2**
13	Eigenvectors & eigenvalues
14	Singular value decomposition

Grading Scale

This course adheres to the grades and quality points described in the Academic Catalogue. Consult the Academic Catalogue for a detailed description.

Honor Code

Students are expected to abide by the Honor Code for all assignments unless a professor indicates otherwise. Students should consult the Academic Catalogue and The Key: The Hampden-Sydney College Student Handbook for the College's description of the Honor Code and what it identifies as infractions of the Honor Code.

Artificial Intelligence Policy

Artificial intelligence (AI) generators and large language models (LLMs) often rely on existing published materials, and copying or paraphrasing materials generated by AI without attribution is plagiarism. Professors may permit students to use AI generators or LLMs in a variety of ways in their own classes. Those students, however, must not assume that those policies transfer to other classes.

Accommodations

Hampden-Sydney College is committed to ensuring equitable access to its education programs for all students. Under the administration of the Department of Culture and Community, the Office of Accessibility Services (OAS) coordinates reasonable accommodations for qualified students with disabilities. If you wish to seek accommodations for this class, please contact Dr. Melissa Wood, Director of Title IX, Access, and Student Advocacy, at 434-223-6061 or at `mwood@hsc.edu`. Additional information may be found here: `https://www.hsc.edu/academics/academic-services/disability-services`. Appropriate documentation of disability will be required. For students who have an accommodations letter from OAS, it is essential that you correspond with your professor as soon as possible to discuss your accommodation needs for the course so that appropriate arrangements may be made.