

# Math 651: Numerical Analysis I - Fall 2021

MoWe 8:40AM - 9:45AM, LGRT 1234

## Contact Information:

Professor: <PROF\_FIRST\_NAME><PROF\_LAST\_NAME>

Office: LGRT 1442; Email: <PROF\_EMAIL> (preferred); Tel: <PHONE>

Office Hours: MoWe 10AM - 11:30AM or by appointment

**Prerequisite:** Knowledge of Math 523 and 235 (or 545) or permission of the instructor.

**Texts:** The main text will be: *An Introduction to Numerical Analysis*, by Kendall E. Atkinson, 2nd edition, John Wiley & Sons.

**Course Description:** This is an introductory numerical analysis course for beginning graduate students from different disciplines. It covers a broad range of fundamental numerical methods for most common mathematical problems. There will be regular homeworks, exams and programming projects. Topics may include:

1. Source of errors and their propagation
2. Root finding for nonlinear equations
3. Polynomial interpolation
4. Approximation theory
5. Numerical integration and differentiation
6. Numerical methods for solving the initial value problems of ODE's
7. Direct and iterative methods for solving large linear systems

**Grading: The final grade will be calculated as follows:**

- **Homework Assignments, totaling 40% of grade.**

There will be seven assignments. They all carry equal weights. *Late homework will NOT be accepted.* For problems involving programming, source code should be sent to me as well. No need to print out the code. But a short explanation (conclusion/observation) should be included. Accepted programming languages: Fortran, C, C++, Python, Julia, Matlab.

- **In-class midterm exam: – 30% of grade.** Date/time and topics covered will be announced in class.
- **Final exam – 30% of grade.**
- **Grading scale:**

Points ( $\geq$ )	0	50	55	59	62	65	69	72	78	82	86
Grade	F	D	D+	C-	C	C+	B-	B	B+	A-	A

## Course policies

If you have a University-approved conflict (see the link in this paragraph) with an exam, you must let your instructor know at least two weeks before the exam. A make-up exam might be scheduled to take place shortly after the regularly scheduled exam. If so, the make-up exam will be different than the original but cover the same material. You will need to fill out the form signed by the Registrar's office, explaining

to your instructor why you are entitled to a make-up. Make sure to not book any travel during exams, including the snow-make-up date for the final. Travel is not an excuse to miss the exam. If a last-minute emergency occurs after the two-week deadline, you will need to present to your instructor a note either from your medical provider for medical emergencies or from the Office of the Dean of Students for non-medical emergencies. If a last-minute emergency occurs after the two-week deadline, you will need to present to your instructor a note either from your medical provider for medical emergencies or from the Office of the Dean of Students for non-medical emergencies.

### **Accommodation Statement**

The University of Massachusetts Amherst is committed to providing an equal educational opportunity for all students. If you have a documented physical, psychological, or learning disability on file with Disability Services (DS), you may be eligible for reasonable academic accommodations to help you succeed in this course. If you have a documented disability that requires an accommodation, please notify me within the first two weeks of the semester so that we may make appropriate arrangements.

### **Academic Honesty Statement**

Since the integrity of the academic enterprise of any institution of higher education requires honesty in scholarship and research, academic honesty is required of all students at the University of Massachusetts Amherst. Academic dishonesty is prohibited in all programs of the University. Academic dishonesty includes but is not limited to: cheating, fabrication, plagiarism, and facilitating dishonesty. Appropriate sanctions may be imposed on any student who has committed an act of academic dishonesty. Instructors should take reasonable steps to address academic misconduct. Any person who has reason to believe that a student has committed academic dishonesty should bring such information to the attention of the appropriate course instructor as soon as possible. Instances of academic dishonesty not related to a specific course should be brought to the attention of the appropriate department Head or Chair. Since students are expected to be familiar with this policy and the commonly accepted standards of academic integrity, ignorance of such standards is not normally sufficient evidence of lack of intent

([http://www.umass.edu/dean\\_students/codeofconduct/acadhonesty/](http://www.umass.edu/dean_students/codeofconduct/acadhonesty/)).