SYLLABUS *

NUMERICAL ANALYSIS II

SPRING 2021

https://www.phys.uconn.edu/~rozman/Courses/m3511_21s/

Last modified: January 19, 2021

Course description: The overall goal of numerical analysis is the design and analysis of techniques to give approximate but accurate solutions to hard problems. MATH 3511 *Numerical Analysis II* teaches this analysis associated with iterative methods of solution of linear equations and eigenvalue problems, approximation theory, boundary value problem for ordinary differential equations, and numerical solutions of partial differential equations, with attention to generation and propagation of numerical errors, stability, and the computational speed of algorithms.

Course format: Hybrid/Blended. The class has both in-person and online components. The class will not meet in-person for all meetings, but in-person instruction will be available. The in-person lectures are video streamed and recorded.

Lectures: TuTh 5:00 – 6:15, McHugh Hall 102

Course website: https://www.phys.uconn.edu/~rozman/Courses/m3511_21s/

*Syllabus information may be subject to change. The most up-to-date syllabus is located on the course website linked above.

Instructor: Michael Rozman

email: michael.rozman@uconn.edu
office hours: Tu 6:15 PM – 7:15 PM using Webex,
Th 6:15 PM – 7:15 PM using Webex,
by appointments
gitlab username: m3511_21s_in

Course TA: Megan Sturm

gitlab username: m3511_21s_ta

Textbook: T. Driscoll and R. Braun, *Fundamentals of Numerical Computation*, SIAM, 2017

Exams: Two midterm take-home exams and a *cumulative* online final exam (also see *Grading scheme* below w.r.t. the final exam).

Grading scheme: The course grade will be calculated using the following two schemes:

Homework projects	35%
2 Midterms	35%
Final exam	30%

Course grade = 0.35*HW + 0.175*[(M1 + M2)] + 0.3*F, correctly rounded to integer and capped at 100%.

Homework projects	45%
2 Midterms	55%

Course grade = 0.45*HW + 0.275*(M1 + M2), correctly rounded to integer and capped at 100%.

The better of the two grades will be used.

The rounding to integers is done using the default rounding mode specified in the IEEE754 standard for floating point arithmetic.

The percent grades are converted to the letter grades as following.

Percent grade	**Letter grade**
94+	A
90-93	A-
87-89	B+

83-86	B
80-82	B-
77-79	C+
73-76	C
70-72	C-

Honors conversion: Students interested in honors conversion should contact the instructor during the second week of classes.

Class schedule: this is a *preliminary* schedule.

Week(s)	Subject
1-5	Matrix analysis. Approximating eigenvalues
6	**Midterm I** - Tue, Feb 23
6-10	Approximation theory
10	**Midterm II** - Thu, March 25
11-12	Boundary value problems for ordinary differential equations
13	**Spring recess**
14-15	Partial differential equations

Authentication of students taking the class remotely: HuskyCT is used as the primary repository and access point for assignments, recorded lectures, and class notes, and students use their NetID and password process to securely access HuskyCT class page.

During the routine interactions via Webex, instructor can ask for identification and/or confirm student identity via official UConn photo in StudentAdmin.

Communications: talking in person is the preferred method to contact the instructor; email is a good option to schedule a video appointment.

- use your UConn email account for class communications

- include the tag "[math3511]" (without quotes) in the subject of your email, e.g. "[math3511] midterm II review"
- as a general rule (not limited to the class emails), the subject line of your email should communicate what the email is about, so that the recipient can prioritize the email's importance without opening it. E.g. "[math3511] Tacoma bridge collapsed - cannot come to the final" would be a good email subject (assuming email existed in 1940 . . .); "urgent", "important", "a question" are bad ones. Do not use your name as a subject – the sender name is already visible as a part of email header. (For the same reason do not start email repeating your name.)
- do not email any attachments or graphics files embedded in your message, unless requested by the instructor

Homework: Homework assignments submitted on time may be returned (at the discretion of the instructor) for corrections after initial grading.

Late homework assignments are not accepted. Individual emergencies can be accommodated by extra credit assignments.

You are welcome to discuss the homework's problems with others in order to better understand them but the work you turn in must be your own. In particular, you must run your own calculations (where applicable) and communicate and explain the results in your own words.

All members of collaborating groups must **consistently** list all collaborators names and submit assignments together.

Assignments that are hard to understand are also hard to grade correctly, therefore: (a) use words and pictures to supplement your equations; (b) work must progress linearly down the page – recopy solutions that are too nonlinear.

Requirements for written assignments:

- $\boxed{\text{Box}}$ your final answer(s) and important intermediate results.
- When submitting hard copies, use letter-size paper. Use only one side of each sheet. Staple your notes together, (i.e. no paper clips, torn or folded corners) with the assignment cover page (if applicable).

  Highly recommended: make copies of homework assignments for your own files.
- When submitting an assignment online, scan your submission, and convert the scan(s) into a single pdf document.

Computer programming: Homework projects require writing simple computer programs. Matlab is used as a programming language for teaching in MATH 3511.

The recommended version of Matlab to use in class is `Matlab R2020b` which (as of this writing) is the latest stable release. This version is installed on UConn Anyware and available for installation on students' personal computers.

Computers are required for coding and submitting programming parts of homework assignments and exams. It is highly recommended to bring computers to every in-person lecture to take the full advantage of programming segments of the classes.

Student responsibilities and academic policies:

Students at the University of Connecticut are held to certain standards and academic policies. Review these important standards, policies — the links are provided on the course website.

Inclement weather: In the event that the University cancels classes because of inclement weather, this applies to all courses (remote, hybrid, in-person).