SYLLABUS

MATH3511 – NUMERICAL ANALYSIS II

SPRING SEMESTER 2020

https://www.phys.uconn.edu/~rozman/Courses/m3511_20s/

Last modified: March 24, 2020

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.

Lectures: TuTh 5:00 PM – 6:15 PM, ~~MONT 419~~ using Webex

Course webpage: http://www.phys.uconn.edu/~rozman/Courses/m3511_20s/

Instructor: Michael Rozman

email:	michael.rozman@uconn.edu
office hours:	Tu 6:15 PM – 7:15 PM ~~in MONT 419~~ using Webex, We 6:15 PM – 7:15 PM ~~in Gant South 119~~ using Webex, Th 6:15 PM – 7:15 PM ~~in MONT 419~~ using Webex, by appointments
gitlab username:	m3511_20s_in

Course TA: Megan Sturm

gitlab username: m3511_20s_ta

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

Exams: Two midterm exams and ~~a~~ an optional *cumulative* final exam. ~~Parts of the exams may be substituted by take-home programming projects.~~ The second midterm exam and the final exam are take-home exams. The final exam is time-restricted to four hours.

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

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

Course grade = 0.35*HW + 0.35*[(M1 + M2)/2] + 0.3*F, correctly rounded to integer and capped at 100%.

Homework projects	40%
2 Midterms	60%

Course grade = 0.4*HW + 0.3*(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** - Thu, Feb 25
6-10	Approximation theory
9	**Spring recess**
11	**Midterm II** - Thu, Apr 2
12-13	Boundary value problems for ordinary differential equations
13-15	Partial differential equations

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

- use your UConn email address 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 exactly 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 subject – the sender name is already visible as a part of email header. (For the same reason do not repeat your name at the beginning of your email.)

- 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.

~~Homework assignments are not accepted after the solutions had been discussed in class, and/or had been posted online, and/or graded assignments returned. Individual emergencies can be accommodated by extra credit assignments.~~ Late homework assignments are not accepted.

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:

- Use letter-size paper. Use only one side of each sheet.
- Box your final answer(s) and important intermediate results.
- 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.

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 R2019b` which 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 lecture to take full advantage of programming segments of the classes.