SYLLABUS

NUMERICAL ANALYSIS I

FALL SEMESTER 2018

http://www.phys.uconn.edu/~rozman/Courses/m3510_18f/

Last modified: December 19, 2018

Course description: The goal of numerical analysis is the design and analysis of techniques to give approximate but accurate solutions to hard problems. MATH 3510 *Numerical Analysis I* teaches this analysis concentrating on direct methods of solution of linear systems, finding zeros of non-linear equations, approximating and interpolating, numerical differentiation and integration, and on solving initial value problem for ordinary differential equations. The attention is given to sources and propagation of numerical errors and to computational efficiency of the algorithms.

Lectures: TuTh 5:00 – 6:15, Monteith 420

Course webpage: http://www.phys.uconn.edu/~rozman/Courses/m3510_18f/

Instructor: Michael Rozman

email:	michael.rozman@uconn.edu
office hours:	Tu 6:15 PM – 7:15 PM in MONT420, We 1:00 PM – 2:00 PM in MONT130, Th 6:15 PM – 7:15 PM in MONT420, and by appointments
gitlab username:	m3510_18f_in

Course TA: Lisa Darminova

email:	lisa.darminova@uconn.edu
gitlab username:	m3510_18f_ta

Textbook: T. Sauer, *Numerical Analysis*, Pearson, any edition

Exams: Two closed book midterm exams and a closed book *cumulative* final exam. Parts of the exams may be substituted by take-home programming projects.

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

Weekly 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 integers and capped at 100%.

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-
67-69	D+
63-66	D
60-62	D-
0-59	F

Class schedule: this is a *preliminary* schedule.

Week(s)	Subject
1-2	Matlab programming
3-5	Direct methods for solving of linear systems
	Midterm I - Tue, Oct 2
6-7	Solution of nonlinear equations
8-10	Interpolation and approximation
	Midterm II - Thu, Nov 1
11-12	Numerical integration
13	**Thanksgiving recess**
14-15	Initial value problem for ODE

Communications: talking in person is the preferred method to communicate with the instructor; email is the next best option.

- use your UConn email address for class communications.
- please include the tag ``[math3510]'' (without quotes, no spaces) in the subject of your email, e.g. "[math3510] midterm II review session".
- 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. "[math3510] 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.
- please no emails with attachments unless requested by the instructor. Use *UConn File DropBox* https://dropbox.uconn.edu/dropbox or *UConn FileLocker* http://web2.uconn.edu/filelocker/ for submitting large files

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.

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.

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.
- $\boxed{\text{Box}}$ 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 MATH3510 (as well as the followup course MATH3511). You may use any programming language for the homework assignments (however, since the instructor needs to read and run your code, clarify the details and requirements in advance).

The recommended version of Matlab to use in class is `Matlab R2018a` which is the latest stable release. This version is installed on *UConn Anyware* and available for installation on students' personal computers.