

University of Montana

ScholarWorks at University of Montana

University of Montana Course Syllabi, 2021-2025

Spring 2-1-2022

M 210.01: Introduction to Mathematical Software

Leonid Kalachev

University of Montana, Missoula, leonid.kalachev@umontana.edu

Follow this and additional works at: <https://scholarworks.umt.edu/syllabi2021-2025>

Let us know how access to this document benefits you.

Recommended Citation

Kalachev, Leonid, "M 210.01: Introduction to Mathematical Software" (2022). *University of Montana Course Syllabi, 2021-2025*. 711.

<https://scholarworks.umt.edu/syllabi2021-2025/711>

This Syllabus is brought to you for free and open access by ScholarWorks at University of Montana. It has been accepted for inclusion in University of Montana Course Syllabi, 2021-2025 by an authorized administrator of ScholarWorks at University of Montana. For more information, please contact scholarworks@mso.umt.edu.

**Course: M 210 Introduction to Mathematical Software / Spring 2022 / T: 3:00 – 5:30 p.m.
Room Math 306**

Instructor: **Professor Leonid Kalachev**

Office hours: MWF 11:00 AM – 12:00 AM or by appointment (Room Math 309).

Textbook: No textbook. Handouts as well as some online resources and manuals will be presented to the students throughout the semester.

Course Description: 3 credit hours. Prereq., one of M 162, M 171, or M 181, or consent of instr. Software packages useful for doing and writing mathematics. Introduction to a computer algebra system (such as Maple or Mathematica), a numerical package (such as MATLAB or R), and elementary programming. Writing and communicating mathematics using the mathematical typesetting system LaTeX.

Intended Audience: Mathematics Majors.

Learning Goals: The students will learn how to use mathematical software

- To write program templates which may be used in their future research / employment
- For visualization of mathematical objects and displaying them graphically
- To model repetitive processes and conditional situations
- Model multidimensional objects using vectors, matrices, or related structures
- Embed algorithms in reusable functions and procedures
- Find solutions to modeling problems using appropriate software
- Using LaTeX, demonstrate the ability to typeset mathematical documents

Course Format: The format is a mixture of lectures, in class problem solving activities and group projects.

Assessment: Several homework assignments will be given during the semester (20% of the final grade) as well as two midterm exams (20% of the final grade each). The final projects (30% of the final grade) will involve both individual and group work; the students will be required to make oral presentations and submit written reports. Some material will only be given in class, so the attendance is very important for understanding of the course material. Thus, the course grade will also be based on attendance (10% of the final grade).

Grading intervals:

A: [85%, 100%]; B: [70%, 85%]; C: [55%, 70%]; D: [40%, 55%]; F: [0%, 40%).

Add / Drop policies: May be found on the web page <https://www.umt.edu/registrar/calendar/spring-2022.php>. Important: after February 8, 2022 a \$10 fee applies per add or drop of a course. **The final deadline for all changes is May 6, 2022.**

Academic Integrity: All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. All students need to be familiar with the Student Conduct Code. You can find it in the “A to Z Index” on the UM home page.

Disability modifications: The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and the Office for Disability Equity (ODE). If you anticipate or experience barriers based on disability, please contact the ODE at: (406) 243-2243, ode@umontana.edu, or visit www.umt.edu/disability for more information. Retroactive accommodation requests will not be honored, so please, do not delay. As your instructor, I will work with you and the ODE to implement an effective accommodation, and you are welcome to contact me privately if you wish.

COVID-19 related guidance (may change during the semester; more information at <https://www.umt.edu/coronavirus/campus-covid-plan/instruction/default.php>):

1. Mask use is required within the classroom.
2. Drinking liquids and eating food is strongly discouraged within the classroom.
3. Stay home and contact the Curry Health Center at (406) 243-4330 if you feel sick and/or if exhibiting COVID-19 symptoms.
4. If you are diagnosed with COVID-19, follow instructions for quarantine and contact your advisor / professor so they can help you stay on track academically.

Important Dates: Tentative schedule is shown below (it may be adjusted as course progresses).

January 18 – February 8, 2022: Typesetting using LaTeX; preparation of publication ready documents (reports, articles, etc.), making presentations, using graphics capabilities.

February 22, 2022: Test #1.

February 15 – March 15, 2022: Programing basics, problem solving and modeling using MATLAB.

April 5, 2022: Test #2.

March 29 – April 26, 2022: Basic review of other software packages (MAPLE, PYTHON, R, MATHEMATICA, SCIEBTIFIC NOTEBOOK, others, as time permits), and their use for mathematics research and education.

May 3, 2022: Review and work on final projects.

May 10, 2022 (Tuesday); 1:10 – 3:10 p.m.: Presentation of final reports.