Course: M 210 Introduction to Mathematical Software / Spring 2020 / 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: The last day to add/drop a course (via CYBERBEAR and without a fee) is January 22, 2020. After January 23, 2020 these changes are allowed to be done only by Petition only (submitted electronically; $10 fee applies), which requires the approval by the professor/advisor. The final deadline for all changes is May 1, 2020.

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 Disability Services for Students (DSS). If you think you may have a disability adversely affecting your academic performance, and you have not already registered with Disability Services, please contact Disability Services in Lommasson Center154 or call 406.243.2243. I will work with you and Disability Services to provide an appropriate modification.

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

January 14 – February 4, 2020: Typesetting using LaTEX; preparation of publication ready documents (reports, articles, etc.), making presentations, using graphics capabilities.

February 11, 2020: Test #1.

February 18 – March 10, 2020: Programing basics, problem solving and modeling using MATLAB.

March 24, 2020: Test #2.

March 31 – April 21, 2020: Basic review of other software packages (MAPLE, PYTHON, R, MATHEMATICA, SCIENTIFIC NOTEBOOK, others), and their use for mathematics research and education.

April 28, 2020: Review and work on final projects.

May 5, 2020 (Tuesday): Presentation of final reports.