Course goals: Enable students to answer mathematical problems using numerical tools that they can implement themselves.

Instructor: François Blanchette (e-mail: fblanchette@ucmerced.edu)

Course learning outcomes: Given a reasonable mathematical problem, graduates from Math 131 should be able to:

1. devise an algorithm to solve it numerically;
2. implement this algorithm;
3. describe classic techniques and recognize common pitfalls in numerical analysis;
4. analyze an algorithm’s accuracy, efficiency and convergence properties.

Applied Mathematics Program Learning Outcomes: This course is aligned with the following Applied Mathematics program learning outcomes:

1. solve mathematical problems using analytical methods;
2. solve mathematical problems using computational methods;
3. recognize the relationships between different areas of mathematics and the connections between mathematics and other disciplines;
4. give clear and organized written and verbal explanations of mathematical ideas to a variety of audiences;

Lectures: Lectures will introduce new concepts, emphasize important aspects of the theory, describe methods used to solved common problems, focusing on course learning outcomes 1, 3, and 4.

Lecture time: MW, 3:30 pm – 4:45 pm in room SSB 170.

Office hours: François Blanchette M 1:00 pm - 2:00 pm and F 9:00 am - 10:00 am in COB 363

Discussion sections: Discussion sections will help review concepts introduced in lectures and, most importantly, develop your programming skills, focusing on course learning outcomes 1 and 2.


Earlier editions may be used if care is taken to answer the correct questions in homework problems.


Topics covered: Computer arithmetic, solutions of one algebraic equation, interpolation and polynomial approximation, numerical differentiation and integration, initial value problem differential equations, direct solution of linear systems, iterative techniques in linear algebra (Chap 1-7).

Homework: Homework will focus on all outcomes and will usually be due one week after being assigned, before 5 pm in your TA's mailbox and/or email. Late homework will not be accepted. Parts of the homework assignment will ask you to submit computer programs. You are encouraged to work in small groups to write your programs, but you MUST identify explicitly all individuals with whom you worked and list explicitly any outside sources employed, including websites. All the work you turn in must be your own! No cut and paste!
Exams: There will be two unit exams and a comprehensive final. All exams will focus on outcomes 1, 3, and 4. The unit exams will be given during lectures the on Wednesday Oct. 8th and Monday November 24th. These will be 75 minutes exams. To avoid disturbances over this short examination period, students will not be permitted to enter the room late or to leave early. The final exam will be held on December 18th, at 11:30am in room SSB 170.

There will be no make-up exams or early exams! If you are sick during a unit exam, please bring a note from your doctor verifying your illness. Your course grade will then be determined by the rest of your course work.

Grade determination: A combination of the 11 homework assignments (35%, the worst homework grade will be dropped), two unit exams (each worth 15%), and one cumulative final exam (35%). Above 85% earns an A, below 55% earns a D, and in between grades are spread evenly.

Course webpage: The Math 131 website is part of the UCMCROPS course management system.

Programming: All required programming will be done in Matlab, Matlab student version, or its free alternative Octave. Matlab can be found on computers in rooms COB 281, KL 202 and KL 208.

Cell phones: All portable electronic devices (e.g., cell phones & blackberry, iphone; pagers) must be turned off and put away during exams, lectures, and discussion sections. Calculators are the exception; they may be used in lectures and discussion sections, but not in exams.

Laptops. The use of laptops in lectures is generally forbidden but permission from the instructor may be granted upon request.

Dropping the course: You may drop this course without paying a fee and without further approval before 4:00 pm, Sept. 18. Dropping the course after this time, but before 4:00 pm, Dec. 12, requires the signed approval of the instructor, and the confirmation of the Dean of the School of Natural Sciences. Students may not drop after Dec. 12 at 5:00 pm. Please see the UC Merced General Catalog for more details.

Extra help: You are encouraged to get extra help whenever you need it. The instructor and TAs all have office hours. In addition, review sessions will be scheduled before each exam. Other helpful items are posted on the UCMCROPS page. You are welcome to send questions to your instructor via e-mail at any time.

Green books: Each student is required to purchase three blue books and give them to their discussion section leader by the third discussion section. These will be distributed for the exams, so please do not write anything (not even your name) on the front of the blue books.

Special accommodations: If you qualify for accommodations because of a disability, please submit a letter from Disability Services to the instructor in a timely manner so that your needs may be addressed. Student Affairs determines accommodations based on documented disabilities.

The instructor will make every effort to accommodate all students who, because of religious obligations, have conflicts with scheduled exams, assignments, or required attendance. Please speak with the instructor during the first week of class regarding any potential academic adjustments or accommodations that may arise due to religious beliefs during this term.

Academic integrity: Academic integrity is the foundation of an academic community and without it none of the educational or research goals of the university can be achieved. All members of the university community are responsible for its academic integrity. Existing policies forbid cheating on examinations, plagiarism and other forms of academic dishonesty. Further information on the academic conduct policy can be found at UC Merced Office of Student Conduct.