Details

- Time: 9:20 – 10:10, MWF
- Room: 200 LOV
- Instructor: K. A. Gallivan
- Temporary Office: 211 LOV
- Office: 421 LOV (after renovations are completed)
- Email: gallivan@math.fsu.edu
- Homepage: http://www.math.fsu.edu/~gallivan
- Office Hours: 10:15 – 12:00 MW and by appointment. These will be in-person or Zoom as requested. There will be a Zoom meeting active during every office hour session. The ID for the Zoom meeting will be announced via an announcement on the Canvas course page.
- Prerequisites: three semesters of Calculus, programming proficiency, familiarity with finite dimensional vector spaces and basic linear algebra or consent of instructor
- The following reference texts are recommended:
- Grades: Programs and associated written problems 100 %
Class Webpages:

1. The class has a Canvas webpage that will be used for class emails, posting and submitting homework assignments, Zoom information about remote meetings and office hours and some class documents such as the syllabus.

2. The main class page is accessible from my departmental homepage www.math.fsu.edu/~gallivan by following the class link. Class notes, homework, programming assignments and announcements will be posted on the class website.

3. You are expected to consult these websites in a timely and regular manner.

4. The user and password information for the class website linked to my departmental homepage will be sent to those registered in a Canvas class email/announcement. If you do not receive this information before the first class contact the instructor.

5. Other books, papers, and software resources will be cited, posted or linked in the class notes, the homework, and on the class website linked to my departmental homepage. These are background material and suggested references. You will be expected to read a small subset identified in the lectures. The others are for your graduate academic development.

Lectures will be in-person unless otherwise stated.

Class Participation Policy: Participation in class by asking questions and responding to questions posed by the instructor is expected and strongly encouraged. The diverse background of the students implies several students will be unfamiliar with each topic and clarification by such questions and responses is vital to understanding. Students are expected to be prepared for class lectures and for any office visits. Students are encouraged to prepare carefully for class by reading relevant posted notes and sections of the textbook.

Meetings with the instructor and TA are also expected and encouraged especially for discussions that are too lengthy for class. It is particularly important to have such meetings early and often for material about which you are uncertain. These will be held on Zoom at agreed upon times. Group meetings are encouraged.

Electronic devices may be used to access class notes and related material during lectures. Other uses of cell phones and similar devices are often disruptive to the lecture and are not permitted.

All programming assignments must be completed in a compiled and typed language, e.g., Fortran, C, C++, Java. Julia is also acceptable but variable types and data structures are expected to be defined and constructed explicitly. MATLAB and scripting languages are not acceptable for the code implementing the algorithms used to solve the assignment but they may be used to control or support the testing and evaluation of your code.

Plagiarism is a violation of the university honor code. With respect to the solutions of programming problems in the homework, it is not acceptable to engage in plagiarism. You may discuss the programming problems with each other but any significant discussion must cited, i.e., it should be treated like the citation of any outside material used in your solutions. Such a citation must include names and the substance
of the discussion. All students must design and implement their own code. All students must write individually the description of the code, its complexity, the experimental design, the empirical results and the interpretation of the results. No student should provide any portion of their code to any other student in class. If you find a library code (not written by a student in class) that performs a portion of the task it must be cited – including the specific source of the code and its function. You are still responsible for describing correctly its implementation and time/space complexity in your solutions. Credit for the program will be prorated based on the amount of functionality performed by a cited library code relative to the functionality required to solve the assigned problem. Citations when writing solutions to the analytical problems included in a graded homework or programming assignment and applicable penalties for plagiarism are covered by these same policies. The first offense of submitting a solution without the appropriate citation will result in 0 credit for the programming/experimental portion of the assignment or the particular solution to the analytical problem. Multiple offenses may result in referral to the university for discipline according to university regulations.

• University Attendance Policy: Excused absences include documented illness, deaths in the family and other documented crises, call to active military duty or jury duty, religious holy days, and official University activities. These absences will be accommodated in a way that does not arbitrarily penalize students who have a valid excuse. Consideration will also be given to students whose dependent children experience serious illness.

• Class Attendance Policy: With the exception of the first class meeting, attendance is not required but it is strongly advised. A student absent from class bears the full responsibility for all subject matter and procedural information discussed in class.

Content

This course covers the design and analysis of efficient and accurate algorithms for problems in numerical linear algebra with an emphasis on those of use in science, engineering, and statistics. Throughout the semester students will implement selected methods and investigate their performance.

Topics include the

• An introduction to the influence of architecture on the design of computational primitives and numerical algorithms that build upon them.

• Fundamental theorems, decompositions and transformations for numerical linear algebra and the design and analysis of efficient and robust numerical methods.

• Numerical methods for
  – linear systems of equations,
  – linear least squares problems,
  – eigenvalue problems,
  – the singular value decomposition,
and matrix equations (Lyapunov and Sylvester)

- Methods will be considered for dense matrix problems, structured matrix problems and large sparse matrix problems.
- Factorization-based methods and iterative methods will be considered where appropriate.

Syllabus Changes

Except for changes that substantially affect implementation of the evaluation (grading) statement, this syllabus is a guide for the course and is subject to change with advance notice.

Honor Code

The Florida State University Academic Honor Policy outlines the University’s expectations for the integrity of students’ academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process. Students are responsible for reading the Academic Honor Policy and for living up to their pledge to “... be honest and truthful and ... [to] strive for personal and institutional integrity at Florida State University.” (Florida State University Academic Honor Policy, found at https://dof.fsu.edu/honorpolicy.htm.)

Americans with Disabilities Act

Students with disabilities needing academic accommodation should during the first week of class:

1. register with and provide documentation to the Student Disability Resource Center;
2. contact the instructor indicating the need for accommodation and what type.

This syllabus and other class materials are available in an alternative format upon request. For more information about services available to FSU students with disabilities, contact the:

Student Disability Resource Center
874 Traditions Way
108 Student Services Building
Tallahassee FL, 32306-4167
644-9566 (voice), 644-8504 (TDD), sdrc@admin.fsu.edu, http://www.disabilitycenter.fsu.edu.

Public Health Protocols

In our classroom, it is expected that everyone will wear a proper, well-fitting mask. As our President has informed the university community, FSU expects everyone on campus to use face-coverings. In regions where virus rates are high, the CDC recommends that even vaccinated individuals wear masks in public indoor spaces, like classrooms, especially where social distancing is not possible. Florida infection and hospitalization rates are greater now than they were at the height of the 2020
surge due to the Delta variant, a more infectious and easily transmissible version of the COVID-19 virus. The best way to protect against serious illness is to be fully vaccinated, but not everyone among us can be. Because the Delta variant can infect even vaccinated individuals and can be spread by them to others, it poses a special threat to members of the community with underlying health conditions and children at home who are too young for vaccination.

For these reasons, FSU expects each member of the community to comply with the public health protocols our President set forth on August 9, 2021, including (1) wearing masks in public indoor spaces, (2) getting fully vaccinated, (3) being tested for the virus if you have symptoms, and (4) staying home and away from others if you are sick. Please remember that you should NOT attend class in person if you have tested positive for COVID-19 or are quarantining after exposure. Finally, please bear in mind that the COVID-19 situation is fast-moving, and that university guidance on the issue may change at any time.

**HB223 Recording**

In this class, consistent with state law and university policy, students are permitted to make recordings of class lectures for personal use only. As noted, sharing, posting, or publishing classroom recordings may subject you to honor code violations and legal penalties associated with theft of intellectual property and violations of other state law. Moreover, students and educators have expressed concern that recording classroom activities may negatively impact the learning experience for others, especially in classes that involve questions, discussion, or participation. To protect a learning environment in which everyone feels free to experiment with ideas, we ask you refrain from recording in ways that could make others feel reluctant to ask questions, explore new ideas, or otherwise participate in class. Students must monitor their recording so that they do not include participation by other students without permission. Students with disabilities will continue to have appropriate accommodations for recordings as established by the Office of Accessibility Services.