SSC 335: Scientific & Technical Computing, Unique # 57590

Instructors: Victor Eijkhout and Jay Boisseau

Time: TTH 12:30 PM – 2:00 PM, RLM 5.122

Course Information

The field of scientific and technical computing covers a wide range of topics. Traditionally dominated by the solution of ordinary and partial differential equations and optimization, it also encompasses many other problems including those that primarily involve sorting and searching, pattern matching, image processing, and many other areas. This course provides an introductory perspective on modern scientific computing, with the goal of enabling participants to use PCs and workstations effectively for scientific/technical applications.

We will begin with an introduction to the traditional mainstays of scientific & technical computing: computer architecture and hardware principles, followed by operating systems and environments. These topics will be covered in the context of using computers for scientific and technical programming, so much attention will be paid to floating point arithmetic and tools for developing and managing scientific code. Next, we discuss issues in developing effective, high-performance scientific technical applications, including useful data structures and algorithms for scientific computing, then discuss the use of mathematical/scientific libraries. We close with a discussion of visualization and analysis tools.

Lecture Times

Lectures will be held Tuesday and Thursday, 12:30pm-2:00pm, RLM 5.122

Required Labs or Discussion Sections

None

Course Prerequisites

Students must have prior programming experience in Fortran or C/C++ and mathematics through calculus, including elementary understanding of differential equations.
Course Materials

The lecture content is derived from many different sources, including reference manuals, journal articles and conference presentations. Lecture notes will be posted on BlackBoard. The following reference material can be consulted for an in-depth understanding of certain subjects.


Instructor Information

Victor Eijkhout eijkhout@tacc.utexas.edu
Jay Boisseau boisseau@tacc.utexas.edu
Phone: 512-475-9451 (main office)
Office Hours: ACES 4.232 after class on Thursday, by appointment.

The instructors can be reached most effectively by email: Please address all inquiries to both instructors, and include SSC335 in the subject line.

TA Information

Saurabh Sardeshpande sardeshpande@ices.utexas.edu
Office Hours MWF 3–4pm, ACES 3SW2C

Homework and Programming Assignment

Assignments will be performed on one or more of TACC's high performance computing resources. Accounts will be handed out during the second week of class.

Students will use their own PCs/Macs/workstations to access the machines through SSH. Free SSH clients for PCs and Macs are through BevoWare or by download at http://www.ssh.com/products/tectia/client/non-commercial.html. Later in the course, an X Windows display server will be needed. A 30-day trial X-Win32 server is available for PCs at http://www.starnet.com/products/, and the free Cygwin environment (http://www.cygwin.com/) also has an X-Windows server.
Grades
Grades will be based on midterm (15%) and final exam (25%), homework and programming assignments (30%), and the final project (30%).

As per university policy, incomplete grades will be granted only for work unavoidably missed at the semesters end and only if 70% of the course work has been completed. An incomplete grade must be resolved within eight (8) weeks from the first day of the subsequent long semester. If the required work to complete the course and to remove the incomplete grade is not submitted by the specified deadline, the incomplete grade is changed automatically to a grade of F.

Class Attendance
Students are highly encouraged to attend class and ask questions.

University Policies

Documented Disability Statement
The University of Texas at Austin provides upon request appropriate academic accommodations for qualified students with disabilities. For more information, contact Services for Students with Disabilities at 471-6259 (voice) or 232-2937 (video phone).

University of Texas Honor Code
The core values of The University of Texas at Austin are learning, discovery, freedom, leadership, individual opportunity, and responsibility. Each member of the university is expected to uphold these values through integrity, honesty, trust, fairness, and respect toward peers and community.