

# Computer Science



Expansive yet focused, rigorous yet flexible, grounded in theory but applications everywhere—it's either a giant paradox or the future of the discipline. OK, it's the future of the discipline. It's an education that helps our students anticipate—and create, and master—and learn to “surf” the wave of the future. Students get their hands dirty (there's lots of research and experimentation, plenty of design work and a year-long Clinic experience), they get their brain focused (deep study of theory and fundamental principles, exposure to a range of application areas), and, in the end, they'll be ready to join a leading graduate program or an innovative firm in almost anything—software engineering, system analysis and design, networking, computer graphics and multimedia, and on and on. They'll make a contribution: to science, to computing, to the human experience.

It starts with foundational knowledge, gets hands-on really quickly, gives them a lot of room to choose electives, and ends with the ultimate hybrid capstone experience, the Clinic. So, to start, students take our innovative introductory course that exposes them to some of the big ideas in computer science as well as several “flavors” of programming. Next, students take a course that examines the principles of computer science more deeply followed by a course in data structures and program development. Then, they investigate some of the deep foundations of the field: computability and logic, algorithms, theory of programming languages, computer systems, and software development. They'll also be thinking about electives—too many to list here, but suffice it to say they look at everything from artificial intelligence to neural networks, from scientific computing to compiler design, plus electives in mathematics and engineering, including mathematical logic, operations research, electronics, and microprocessors and Very-large-scale integration (VLSI).

To achieve such lofty goals, the department has a constant need for equipment, with a need to update some each year. Specific equipment that could be used now includes:

- **Networking Equipment**

Cisco Catalyst 3750 switches - There is a need for a number of them. As we redo our labs, having two 48 port gigabit 3750s would be ideal. Also there is a need for two 24 port gigabit 3750s for our server rack.

- **Servers**

We use various servers dedicated to specific tasks. Currently we have two machines handling LDAP. The current Apple Xserve would be an ideal replacement machine.

Compute servers. We have a number of compute servers. Currently, they are a mix of Dell and IBM servers. We would love to replace them. In particular rack-mounted multi-core machines from Dell or IBM would be ideal for our servers and/or our compute cluster (a Beowolf cluster for large compute intensive projects).

- **Storage**

We are no longer using tape backup. Rather we use RAID disks and extra disks for back up. We have been looking at: the Promise VTrak E-Class SATA RAID, (Especially since it has support for RAID 6.) But any reasonable RAID system would work.

- **Faculty and Student Desktops**

We have gradually become an Apple shop. We use iMacs and Mac minis in the labs. Six of the faculty use Macs. We are looking to replace 30 of our 60 lab machines. These are the work stations for all the students taking our classes, e.g., CS 5, CS 60, etc. For us, this world is Apple. We need to get iMacs with 4 GB of RAM. Mac Minis (which we have now) are just too underpowered.

- **Clinic Machines**

Clinic machines are Dells, again because they are reasonably priced and easy to order. We could go to HPs, but have never really made a decision to go to a new vendor. We try to buy 5-10 machines each year (rotating out old machines).

- **Graphics and Game Machines**

Previously we would buy high end machines from Dell and then upgrade them with more memory and better graphics cards. Today, most of the Dell workstations are adequate; they come with more memory and have NVIDIA graphics cards. Again, we could move to HP or another high quality machine.

A critical need that must be filled in the Computer Science department involves funding for additional support staff in the systems area; we have a current year goal of raising \$30,000 to meet this need.