Computer Science and Engineering

Computing is essential for managing the infrastructure of the world, from the distribution of water and electricity to the management of transportation systems and global commerce. Computing is also essential for supporting research across the entire spectrum of modern science, as well as developing the scientific principles of information, computation, and knowledge. Computing not only provides access to existing information, but also is responsible for creating new information in other areas of science. For example, mapping genomes and determining the proteins they produce is a computational problem; creating many Hollywood movies cannot be done without computer graphics and animation; decoding ancient languages from fragments of text scratched onto stone tablets is a problem of information theory; and discovering new particles in nuclear physics requires computers to trace and sort among the nuclear interactions occurring in a supercollider.

At the University of South Carolina, an undergraduate degree in computing provides an excellent starting place for a career field in which substantial growth is predicted. Computing professions draw on a wide variety of talents and interests. For example, scientific computing professionals need a strong background in mathematics, while those working in areas such as user interfaces need a strong background in social sciences and communication.

At USC you can combine a major in computing with a major or minor in another discipline to satisfy your broader interests and increase your marketability. These degree options allow you to combine the study of computing with intensive study in another area. For example, a combination of biology and computing provides an excellent background for bioinformatics or medicine.

According to Information Week in 2009, “More Americans are employed in IT than at any time in the nation’s history.” Moreover, there are more jobs predicted in computing than in all other fields of science and engineering combined. The U.S. Department of Labor predicts substantial growth in the following occupational categories:

- Computer and information system managers
- Computer software engineers
- Computer scientists and database administrators
- Computer support specialists and system administrators
- Computer system analysts.

Undergraduate Programs at USC

We offer three majors in computing: computer engineering, computer information systems, and computer science. Students in all three majors take a common core of computer science courses as well as additional courses in supporting areas.

The particular choice of a major in computing will depend in part on your interests outside computing. Computing is a horizontal discipline – there are few parts of the world in which computers are not used.

**Computer engineering** majors work with both hardware and software, and they look at design problems associated with the integration of hardware and software components. The systems they work with may be found everywhere: from automobiles, to mobile phones, to kitchen appliances.

**Computer information systems** majors focus on the use of computer applications to support businesses. They look at a variety of challenges – ranging from financial markets to insurance to e-commerce – and they take core business courses as part of a minor in business information management.
Computer science majors focus on improvements in the efficiency and effectiveness of computation within a chosen application area and of computing applications in general.

Hardware and software technology in computing changes rapidly, and computing professionals routinely find themselves working with technology they did not learn in college, because it has only just been invented. For this reason, the USC degree programs stress the principles of computing, rather than today’s current fad, so our graduates will be able throughout their careers to learn new technology when they need it and to adapt to the constant changes they will encounter.

Many computing students continue their education at the graduate level, either at USC or elsewhere. The department offers a fast-track option for students with excellent academic records to enter graduate school at USC before completing an undergraduate degree. There is also an accelerated option for students to enter USC’s International MBA program.

Most students who go to graduate school choose a program in computer science and engineering, and they generally receive research or teaching assistantships to support their graduate study towards a master’s or doctorate degree. Other students have found success in MBA or MD programs.

Graduate Programs at USC
The University of South Carolina offers several options for graduate study in Computer Science and Engineering:

- Master of Engineering in Computer Science and Engineering (course work only)
- Master of Science in Computer Science and Engineering (requires a thesis)
- Certificate of Graduate Studies in Information Assurance and Security – a focused course-based program
- Doctor of Philosophy in Computer Science and Engineering

Many courses in the graduate programs, including the required courses for all programs, are available through the APOGEE distance education program.

Research Programs at USC
Undergraduate and graduate students in the Department of Computer Science and Engineering can participate in research projects in areas such as:

- Artificial Intelligence
- Bioinformatics
- Computational Science
- Computer Architecture
- Computer Networks
- Computer Vision and Image Processing
- Information Assurance and Computer Security
- Multiagent Systems
- Robotics
- Software Engineering

In addition to its many research labs, the department also houses two centers for research, development, and education: the Center for Information Technology and the Center for Information Assurance Engineering. Funding for the department’s research programs has been received from many sources, including the National Science Foundation, the National Institutes of Health, the Department of Defense, and private companies.

Need info?
For more info on programs in the Department of Computer Science and Engineering at the University of South Carolina, visit us on the Web: www.cse.sc.edu

For info and news on career trends in computing visit: