

WHY CHOOSE

UNIVERSITY OF CALIFORNIA SANTA BARBARA

COMPUTER SCIENCE

THE CONVERGENCE OF EDUCATION AND ENGINEERING

In naming UCSB one of its 25 “hottest colleges,” *Newsweek* states “If there’s a more beautiful campus than this one at the edge of the Pacific, we haven’t seen it...”



WHY STUDY COMPUTER SCIENCE?

Do you enjoy puzzles? What if solving those puzzles could change the world? Almost every major challenge facing our world is turning to computing for a solution, from conquering disease to eliminating hunger, from improving education to protecting the climate and environment. Information is the key to all of these problems, and computer scientists make it possible to visualize, secure, explore, transmit, and transform this information in ways never before thought possible. Solving these problems through computation means teamwork, collaboration, and gaining the interdisciplinary skills that modern careers demand. This fact is not lost on the job market, which has big demand and big salaries for qualified computing professionals.

why choose U.C. Santa Barbara

“...For many students, that would seal the deal, but UCSB also boasts Nobel Prize winners on its faculty, top research centers in science and technology and an extensive study-abroad program.”

ARE YOU IN DEMAND?

Starting salaries for the class of 2008

Computer Science National Average* **\$60,416**

UC Santa Barbara Average: **\$64,160**

Job prospects should be excellent, as computer software engineers are expected to be among the fastest-growing occupations and add the most new jobs through the year 2016, according to the United States Bureau of Labor Statistics. Employment is projected to increase by 38 percent over the 2006-16 period, which is much faster than the average for all occupations. According to our surveys, **UCSB Computer Science students make on average \$64,000 within one year of graduation, which is higher than the national average.**

* According to the 2008 National Association of Colleges and Employers

WE ARE QUALIFIED

- UCSB ranked 12th in the list of U.S. public universities by *U.S. News and World Report*
- B.A. programs in Computer Science emphasizing interdisciplinary collaboration in Biology, Geography, and Economics
- Bachelor of Science degree accredited by the Computing Accreditation Commission of ABET, 111 Market Place, Suite 1050, Baltimore, MD 21202-4012 - phone: (410) 347-7700
- BS/MS program option in Computer Science
- True four-year programs
- State-of-the-art teaching and research laboratories
- Excellent student to faculty ratio (10 to 1)
- Faculty named in the campus wide teaching awards
- Two faculty named by MIT's Technology Review Magazine as among the top 35 innovators under the age of 35
- Research opportunities with a group of friendly faculty focused on productive research
- \$15 million dollars in research money in the last three years

Computer Science

why I chose...



Melissa Gross: Entered as a Freshman

What made you choose UCSB?

The atmosphere very naturally drew me to this campus; UCSB is a very high-achieving academic school and looking around, it is easy to see that the student population is highly intelligent and driven, yet, at the same time, the atmosphere is very laid back and low stress, which was very refreshing for me.

What made you realize that you wanted to study Computer Science?

I began studying computer science, actually, as a result of something my dad said. As I was completing my college applications, my dad mentioned that I might like computer science, since I liked both my high school math and science classes, as well as creating and finding structure and patterns. And so I went ahead, and declared Computer Science on my application and I'm two years into the program and really loving it. I won't say it wasn't a struggle at first, but I have learned a great deal and am constantly amazed by how exciting and innovative this field is.

What has been your favorite academic experience at UCSB?

I think my favorite academic experience was this last quarter in one of my computer science classes. We had a deadline for a programming assignment and it was coming down to the wire for all of us, so we all ended up in the computer lab at the same time. We were just swapping problems and advice back and forth, and it made for a really fun and exciting group dynamic. The spirit of collaboration is

one of the things I like best about my classes; I've found a lot of help from my peers, and we all just try and help each other as much as we can.

What are your future plans?

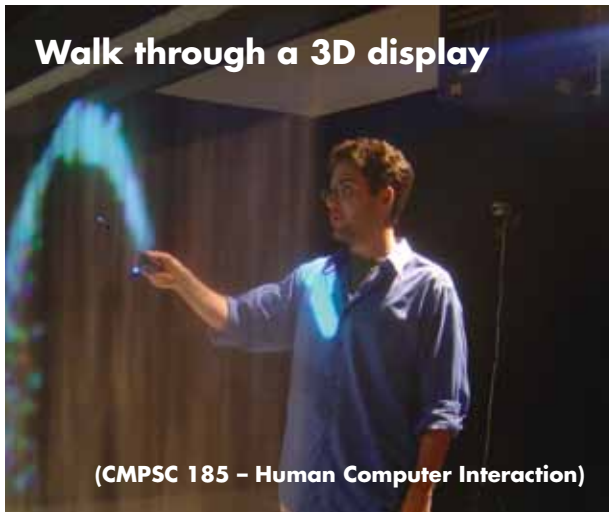
I am eager to start working in industry as soon as I graduate. I'm really trying to find an internship this summer and I'm hoping that this will lead me to connections with companies that will eventually result in job offers.

What would you tell a current high school student who might like to study Computer Science?

I think coming to UCSB, I was a little shocked by how fast things move in the quarter system, so I would tell a high school student to mentally prepare yourself for very fast moving classes. As far as computer science specifically, I wish I had known even the basics of programming techniques because coming in with some previous experience definitely helps. My advice, if you haven't programmed before, would be to at least talk to someone you know who has done some programming, or if you have time, take a programming class at your local community college – it will help a lot!

what's going on...

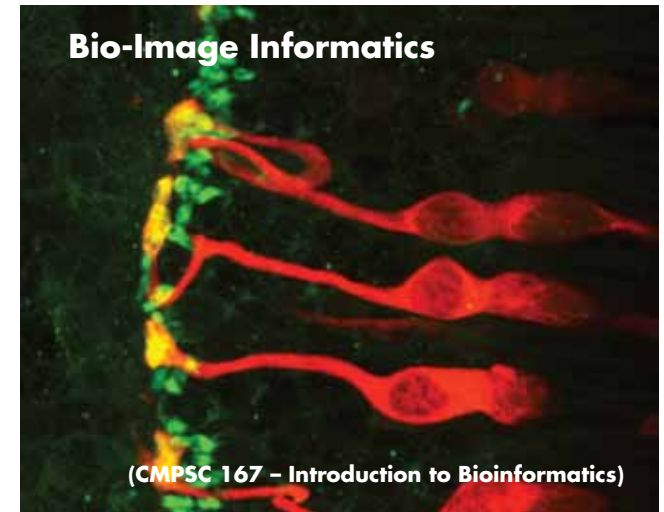
With 29 full-time faculty and almost 300 undergraduates, it is impossible to summarize all that is going on in the Computer Science Department. Here is a glimpse of three topics covered in undergraduate courses:



In collaboration with Fogscreen Inc., the UCSB "Four Eyes Laboratory" (directed by Professors Höllerer and Turk) is building the world's first interactive walk-through 3D display. As featured on the Discovery Channel, the images literally float in the air, projected onto thin layers of water-based fog that are dry to the touch. Combining robust camera-based position tracking, and hand gesture recognition, the end result is a more engaging interactive environment one can literally reach for, and even walk through.



In 2003, Computer Science Professor Giovanni Vigna established the annual UCSB International Capture The Flag (iCTF) contest. The iCTF is a multi-site, multi-team hacking contest, whose goal is to test the security skills of the participants. By 2008, the iCTF had ballooned to 40 teams and several hundred students from around the world, making it the largest live security exercise ever performed on the internet. This kind of deep understanding of "black hat" techniques gives students that take Professor Vigna's course an incredible advantage in the practice of applied computer security.



Professor Ambuj Singh, a member of the interdisciplinary Center for Bio-Image Informatics, and is advancing the state of the art in imaging, pattern recognition, and data mining, to gain a better understanding of those complex biological processes that rule at the cellular and sub-cellular scales. For example, by carefully studying a sequence of bio-images, the cellular changes that occur following retinal detachment and reattachment can be carefully tracked – hopefully leading to new therapies and treatments.

Education Highlights

BS/MS Programs

Outstanding students can earn a baccalaureate and master's degree in 5 years.

Engineering Honors Program

Engineering honors program privileges include: priority registration, residential housing scholars floors, research opportunities, and honors courses.

Research/Internships

Opportunities exist for Undergraduates to be involved in research and receive either course credit or a salary. Many get their work published in top international research journals.

Professional Societies

Active student chapters of professional societies include the Association for Computing Machinery, Engineers Without Borders, and the Society of Women Engineers.

Special Programs

The college coordinates a diverse range of programs for student support, including mentoring, tutoring services, study skills workshops, and career planning. We also partner with the MESA Center on campus, which offers special services to first-generation college students.

Scholarships

Numerous scholarships are available to continuing students in the college.

www.engineering.ucsb.edu/current_undergraduates/scholarships

Entrepreneurial Courses

The Technology Management Program provides classes in management, entrepreneurship, and marketing where students can earn a technology certificate. Computer Science students have been among the winners of the \$10,000 business plan award! www.tmp.ucsb.edu

what you do...

Solving Real World Problems

Can you see the big picture? Solving real world problems with computers requires more than just pounding out code as fast as you can type. Just like directors, composers, and architects, a computer scientist needs to know how the low-level parts work, but finds an intellectual challenge in how these parts can be assembled together into useful and beautiful compositions. It just happens that in Computer Science our compositions are often solutions to previously unsolvable problems. No wonder *CNN/Money* magazine gave Software Engineers an A for their ability to be creative in their jobs; innovation permeates all levels of Computer Science!

As a discipline of problem solving, our Computer Science curriculum is designed to give you the tools you need to tackle whatever new challenges come down the road. You could end up working on self-adapting wireless networks that span the globe, designing systems that recognize your gestures and moods, building online communities that seamlessly connect millions of users, designing and programming games and entertainment, or constructing systems like Google Search that serve the needs of billions of people across the world in a fraction of a second. These problems excite many of our students so much that a lot of them choose to continue their education by earning a master's degree in CS at UCSB through the 5-year BS/MS program, or continuing on to graduate school at another university.

What you will study in Computer Science

Freshmen are introduced to computer programming in the first year at UCSB and complete a major group project during the sophomore year.

- Students are exposed to a balance of fundamental theories and principles in science and engineering with the practical skills necessary to apply them.
- A broad selection of technical electives encourage students to pursue special interests in bioinformatics, intelligent and interactive systems, networking, operating systems and distributed systems, software engineering, computational science, and security systems.
- Students compliment their classroom education by participation in research, industrial internships, membership in professional societies, and by studying abroad. They also participate in a variety of competitions and conferences, making valuable connections in industry.
- Computer science majors work in a spectrum of settings, from Fortune 500 companies to start-ups, as well as in government and at universities.

Oh, the places you can go...

Education Abroad Program

The College encourages its students to participate in the U.C. Education Abroad Program to enhance their educational experience. Participants stay registered at UCSB while abroad and make timely progress towards their degrees. Nearly all participants say their EAP experiences were life-changing, career-enhancing, and the highlight of their education. <http://eap.ucop.edu>



“I came back from EAP with a new language, new engineering skills, and a new outlook on my future in the global economy.”

Chris Herbert –
Computer Science major

EAP Student at
Tohoku University,
Senda, Japan

why I transferred...

Christopher Kyle Hall
Transfer Student

What made you choose UCSB as your engineering destination?

I was specifically drawn to UCSB, out of the other three universities I was considering, due to the diversity of undergraduate courses offered, and the undeniably gorgeous location. The Computer Vision and Human Computer Interaction courses especially caught my eye.

How satisfied are you with your experience so far?

My transfer situation was potentially a bit rough. I had a tricky task of getting caught up and in phase with where I should be in order to move from pre-major to full-major status in my junior year. However, the engineering transfer adviser at UCSB proved invaluable in actively working with me and CS faculty to make it as painless an experience as possible and ensure that I had the opportunity to get myself on track. That professional hospitality combined with all the excellent professors and interesting electives, has made for a very satisfying experience for me.

What would you tell a student currently at a community college about preparing to transfer to a computer science major?

My transfer experience says a lot about the importance of getting advising from both the community college and the transfer university in order to have realistic expectations and make informed decisions. Although I had glanced at assist.org and completed IGETC, I wish I had spoken to an adviser to also become familiar with the idea and requirements of pre-major versus full-major status.

What has been your favorite experience while studying at UCSB?

My favorite course so far is CS 160: Translation of Programming Languages, because it puts a lot of theory to application, and essentially bridges the two ends of the hardware /software spectrum studied thus far.

What are your future plans?

Currently, I am applying for the masters program at UCSB, and starting undergraduate research in the field of Human Computer Interaction. I am very excited about the prospects of the future and the evolution of my relationship with UCSB. I am keeping busy with a part-time internship at a local engineering company near campus, which has been very flexible with hours and allowing me to put school first.



Admissions

The College of Engineering seeks to enroll well-prepared students who exceed UC's minimum academic requirements, students who will bring passion, creativity and dedication to their college experience.

Given the strength of its programs and its national reputation, it is not surprising that UCSB's College of Engineering receives applications from more qualified students than can be admitted. Each applicant must apply to a specific major, and those with the strongest qualifications are admitted. The exact level of performance required to gain admission to the College varies from year to year and from major to major depending on the size and quality of the applicant pool and the number of available enrollment spaces. The College accepts applications for the fall term only and gives preference to freshmen and upper-division transfer students (those who have completed at least 90 transferable quarter units).

High School Preparation

When admitting freshmen, the College considers: GPA in college preparatory courses and standardized test scores (with an emphasis on mathematics grades and scores); completion of coursework beyond the university's A-G requirements; advanced placement; and honors courses, especially in science and mathematics. For more information about applying to UCSB as a freshman see:

www.admissions.ucsb.edu/

SAT Reasoning Test (or ACT plus Writing) and two SAT Subject Tests

UC A-G courses:

- A. Two years of history or social science
- B. Four years of college-preparatory English
- C. Three years of mathematics (four years recommended) to include pre-calculus or calculus
- D. Two years of laboratory science (three years recommended) to include two of the following: biology, chemistry or physics
- E. Two years of language other than English (three years recommended)
- F. One year-long approved arts course from a single discipline (dance, drama, music or art)
- G. Two semesters of college-preparatory electives beyond the requirements above

For course information specific to your California High School see: <https://doorways.ucop.edu/list/>

Opportunities to get a head-start on your freshman year:

UCSB offers many opportunities for incoming students, from the Freshman Summer Start Program where students can get an early start on classes, to summer bridge programs which offer hands-on work with scientific research projects. For a complete list of summer opportunities, see:

www.engineering.ucsb.edu/prospective_undergraduates/summerop_fresh



Transfer Preparation

For general University of California Transfer Admissions information, please see: www.universityofcalifornia.edu/admissions/undergrad_adm/paths_to_adm/transfer.html

California Community College students should refer to www.assist.org for course articulations and information on the California Community College Transfer Admissions Guarantee.

Required Courses:

One year calculus for engr.	Three semesters calculus-based physics
Differential equations	Intro. to computer programming
Linear algebra	Course in computer programming methods
Introduction to Unix or Linux	Assembly language and computer architecture

When admitting transfer students, the College considers the amount of preparatory coursework completed, grades earned in those courses, and cumulative transferable GPA. Consequently, transfer students should focus on completing all engineering preparatory courses offered at their college with the best grades possible and then finishing their General Education requirements after matriculation to UCSB. IGETC is not recommended for this major. Successful recent transfer applicants had completed more than 75% of the preparation for the major courses with a GPA of 3.0 or above. **The average time to degree for a Computer Science transfer student at UCSB is 2.5 to 3 years.**

Opportunities for transfer students:

- Shorten your time to degree by attending UCSB the summer before you begin your first fall quarter as a transfer student
- Participate in the Summer Transitions Program for new transfers
- Engage in scientific research through a summer enrichment program

For a complete list of transfer student opportunities, see: www.engineering.ucsb.edu/prospective_undergraduates/summerop_trans

College of Engineering Transfer Admission Advising

admissions@engineering.ucsb.edu
(805) 893-6139

Need More Information?
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