

UCSB Computer Science



Graduate Student Handbook

2013-14

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Important Contacts

Chair:	Subhash Suri	suri@cs.ucsb.edu 893-5334
Vice Chair & Graduate Advisor:	Elizabeth Belding	ebelding@cs.ucsb.edu
Graduate Advisor:	Tim Sherwood	sherwood@cs.ucsb.edu
Student Services:	Sheryl Reimers, Student Affairs Manager	sreimers@cs.ucsb.edu 893-4323
	Jillian Title, Graduate Matters	jillian.title@cs.ucsb.edu 893-4322
	Benji Dunson, Undergraduate Matters	benji@cs.ucsb.edu 893-4321
Technical Support:		support@cs.ucsb.edu

Important Locations

Chair's Office	2104 Harold Frank Hall
Student Affairs Office	2104 Harold Frank Hall
Financial Services Office	2107 Harold Frank Hall
Graduate Student Mailboxes	Trailer 698
Faculty Mailboxes	2108 Harold Frank Hall
Technical Support	1153 Harold Frank Hall

Computer Science Faculty

<u>Faculty</u>	<u>Email (@cs.ucsb.edu)</u>	<u>office (HFH)</u>
Divyakant Agrawal distributed systems and databases	agrawal	Rm 3117
Kevin Almeroth computer networks and protocols, large-scale multimedia systems, performance evaluation and distributed systems	almeroth	Rm 2113
Elizabeth Belding mobile networking, wireless networks and protocols, multimedia systems, performance evaluation, wireless solutions for developing regions	ebelding	Rm 2121
Tevfik Bultan model checking, concurrency, web services, static analysis, software engineering	bultan	Rm 2123
Peter R. Cappello Java/Internet-based parallel computing, multiprocessor scheduling, market-based resource allocation, self-directed learning	cappello	Rm 2157
Frederic T. Chong computer architecture, novel computing technologies, quantum computing, embedded systems, and architectural support for system security and reliability	chong	Rm 5163
Phillip Conrad computer science education, computer networks and communication, multimedia computing, transport protocols, web technologies	pconrad	Rm 1113
Diana Franklin computer architecture, embedded systems, architectural support for reliability, undergraduate teaching methods for diverse populations	franklin	Rm 1115
Ömer Egecioglu bijective and enumerative combinatorics, parallel algorithms, approximation algorithms, combinatorial algorithms	omer	Rm 2115
Amr El Abbadi information systems, databases, fault-tolerant distributed systems	amr	Rm 3115
Frederic Gibou computational mathematics, modeling and simulations - materials science, multiphase flows; level-set methods, ghost-fluid methods, and interface problems; and image segmentation with applications to radiotherapy treatment planning and civil engineering	fgibou	Rm 2334 Eng II

John R. Gilbert	gilbert	Rm 5109
combinatorial scientific computing, tools and software for computational science and engineering, numerical linear algebra, smart matter and systemic MEMS, distributed sensing and control		
Teofilo Gonzalez	teo	Rm 2119
multimessage multicasting, VLSI placement and routing algorithms, scheduling theory; design and analysis of algorithms		
Benjamin Hardekopf	benh	Rm 1109
programming languages: design, analysis and implementations		
Tobias Höllerer	holl	Rm 2155
human computer interaction, computer graphics, virtual and augmented reality, wearable and ubiquitous computing		
Richard A. Kemmerer	kemm	Rm 2165
specification and verification of systems, computer system security and reliability, programming and specification language design, software engineering, secure mobile computing		
Chandra Krintz	ckrintz	Rm 2153
dynamic and adaptive compilation systems, high-performance internet (mobile) computing, runtime and compiler optimizations for Java/CIL, efficient mobile program transfer formats		
Christopher Kruegel	chris	Rm 1117
computer and network security, malware detection, websecurity, program analysis, operating systems		
Linda R. Petzold	petzold	Rm 5107
computational science and engineering, multiscale numerical simulation, systems biology		
Tim Sherwood	sherwood	Rm 1119
computer architecture, dynamic optimization, network and security processors, embedded systems, program analysis and characterization, hardware support of software systems		
Ambuj Singh	ambuj	Rm 3119
bioinformatics, databases, parallel and distributed systems		
Jianwen Su	su	Rm 2161
database systems and applications, web services		
Subhash Suri	suri	Rm 2111
algorithms, internet computing, computational geometry		

Matthew Turk	mturk	Rm 2163
computer vision, human computer interaction, perceptual user interfaces, imaging systems		
Wim van Dam	vandam	Rm 2151
quantum computation, quantum algorithms, quantum communication, quantum information theory		
Giovanni Vigna	vigna	Rm 2159
computer and network security, network models and protocols, mobile code languages and systems, mobile agent security		
Yuan-Fang Wang	yfwang	Rm 3113
computer vision, computer graphics, artificial intelligence		
Richard Wolski	rich	Rm 5165
distributed systems, computational grid computing, on-line performance forecasting		
Xifeng Yan	xyan	Rm 1111
data mining, data management, machine learning, bioinformatics		
Tao Yang	tyang	Rm 5113
parallel and distributed systems, high performance scientific computing, cluster-based network services, Internet search		
Ben Zhao	ravenben	Rm 1123
large-scale distributed systems, security and privacy, overlay and peer-to-peer networks, mobile and wireless networks		
Heather Zheng	htzheng	Rm 1121
wireless/mobile/ad hoc networking, cognitive radio and dynamic spectrum networks, multimedia communications, security, game theory, algorithms, network simulation and modeling		

Computer Science Lecturers

<u>Lecturer</u>	<u>Email(@cs.ucsb.edu)</u>	<u>office (Phelps)</u>
C. Michael Costanzo	mikec	Rm 1409B
Janet Kayfetz	kayfetz	Rm 1409D

Computer Science Affiliated Faculty

Theodore Kim, Media Arts & Technology, kim@mat.ucsb.edu

B.S. Manjunath, Electrical and Computer Engineering, man@ece.ucsb.edu

P. Michael Melliar-Smith, Electrical and Computer Engineering, pmms@ece.ucsb.edu

Kenneth Rose, Electrical and Computer Engineering, rose@ece.ucsb.edu

Klaus Schauer, Computer Science, schauer@cs.ucsb.edu

Computer Science Research

Bioinformatics

Bioinformatics, Bioimage databases, multimedia databases, scalable information processing, pattern discovery, molecular computing, membrane computing

Faculty: Ambuj Singh, Xifeng Yan

Labs: The Distributed Systems, Databases, and Bioinformatics Lab (DBL)

Computational Science and Engineering

Computational mathematics, modeling and simulations, materials science, multiphase flows, distributed data analysis, collaborating sensors, parallel scientific computing, modular robotics, multiscale simulation, sensitivity analysis, model reduction.

Faculty: Frederic Gibou, John Gilbert, Linda Petzold, Tao Yang, Xifeng Yan

Labs: Combinatorial Scientific Computing Lab, Computational Science and Engineering Lab

Computer Architecture

Computer architecture, novel computing technologies, quantum computing, embedded systems, low-energy computing, network and security processors, architectural support for systems security and reliability

Faculty: Fred Chong, Diana Franklin, Chandra Krintz, Tim Sherwood, Heather Zheng

Labs: Computer architecture lab (ArchLab), The Lab for Research on Adaptive Compilation Environments (RACELab), LINK: Lab for Intelligent Networking

Computer Science Education and Diversity

Computer science education, recruiting and retaining diverse populations, computing in K-12 education, training k-12 teachers.

Faculty: Phillip Conrad, Diana Franklin

Database and Information Systems

Distributed databases, fault-tolerance distributed systems, multimedia databases, spatial databases, theory of database systems, database applications

Faculty: Divyakant Agrawal, Amr El Abbadi, Ambuj Singh, Jianwen Su, Tao Yang, Xifeng Yan

Labs: Distributed Systems Lab (DSL), The Distributed Systems, Databases, and Bioinformatics Lab (DBL)

Foundations and algorithms

Design and analysis of algorithms, theory of computation, parallel algorithms, approximation algorithms, quantum algorithms, quantum communication, quantum information theory, combinatorial algorithms, VLSI placement and routing algorithms, scheduling theory, computational geometry

Faculty: Omer Egecioglu, Teofilo Gonzalez, Subhash Suri, Wim van Dam

Intelligent and Interactive Systems

Human-computer Interaction, computer graphics, virtual and augmented reality, wearable and ubiquitous computing, computer vision, perceptual computing, artificial intelligence

Faculty: Tobias Hollerer, Matthew Turk, Yuan-fang Wang, Xifeng Yan

Labs: Four Eyes Laboratory (Imaging, Interaction, and Innovative Interfaces), Computer Vision Research Laboratory

Networking

Computer networks and protocols, large-scale multimedia systems, mobile and wireless networks, quality of service, network modeling and simulation, peer-to-peer and overlay networks, dynamic spectrum and cognitive radios, high-performance mobile computing, network security, network models and protocols, social networking

Faculty: Kevin Almeroth, Elizabeth Belding, Chandra Krintz, Subhash Suri, Ben Y. Zhao, Heather Zheng

Labs: Next Generation Networking Group (NG2), Networking and Multimedia Systems Lab (NMSL), Mobility Management and Networking (MOMENT) Lab, The Lab for Research on Adaptive Compilation Environments (RACELab), SAND Lab: Systems, Algorithms, Networks and Data

Operating Systems and Distributed Systems

Large-scale distributed systems, computational grids, market-based resource allocation, fault-tolerant distributed systems, Internet-scale systems, computational economies for resource allocation

Faculty: Divyakant Agrawal, Amr El Abbadi, Peter Cappello, Chandra Krintz, Ambuj Singh, Rich Wolski, Tao Yang, Ben Y. Zhao

Labs: Distributed Systems Lab (DSL), The Lab for Research on Adaptive Compilation Environments (RACELab), The Distributed Systems, Databases, and Bioinformatics Lab (DBL), SAND Lab: Systems, Algorithms, Networks and Data

Programming Languages and Software Engineering

Next-generation programming language design and implementation and software engineering techniques. Fundamental principles, techniques, and tools for program analysis, modeling, and behavioral characterization for a wide range of application domains: web services, data-centric (business and scientific) workflows, concurrent and distributed systems. Static and dynamic methods for computer-aided verification, security, compilation, and optimization. Hardware and software techniques for program profiling, predicting resource and energy consumption, and automatic adaptation of program behavior.

Faculty: Tefvik Bultan, Benjamin Hardekopf, Richard Kemmerer, Chandra Krintz, Tim Sherwood, Jianwen Su

Labs: Verification Laboratory (VLab), Reliable Software Group, The Lab for Research on Adaptive Compilation Environments (RACELab), Computer architecture lab (ArchLab)

Security

Specification and verification of systems, computer system security and reliability, programming and specification language design, network security, security-enhanced microprocessors, mobile agent security

Faculty: Richard Kemmerer, Giovanni Vigna, Fred Chong, Tim Sherwood, Ben Y. Zhao

Labs: Reliable Software Group, SAND Lab: Systems, Algorithms, Networks and Data

Getting Started

Registration

Continuous registration is required of all graduate students. Graduate students who fail to register are not considered to be students; they relinquish the right to use faculty time and take advantage of University resources and facilities available to registered students. When students have been unregistered for some time, they will be required to reinstate to graduate status and register, particularly when they will be consulting with faculty and using University resources. In some cases, students will be required to prove they are still current in the field either by taking classes or by re-taking their qualifying examinations.

Registration is completed on-line via the GOLD system (Gauchos On-Line Data). Students register in the middle of the quarter for the following quarter including fall. Your pass times for registration can be obtained on GOLD or on the Registrar's website (<http://www.registrar.ucsb.edu/>). It is very important that students register on time. The Registrar's Office will assess a \$50 late fee for any student who registers after the deadline.

The Computer Science department requires all students to register in 12 units each quarter and to maintain 12 units of registration throughout the quarter. These units may include course work (100 or 200 level), TA units (501 or 502) or independent research units (500 level).

Graduate students have until the 15th day of instruction each quarter to add a class. After this date, a schedule adjustment petition is required along with justification for the late add. The Graduate Division must approve late add petitions. Graduate students have until the last day of instruction to drop a course. These dates can be found on the Registrar's website.

Fees

Fees are due the first day of the quarter. All fees (fees, tuition and insurance) except for the campus fees are normally paid for Ph.D. students who are employed as Teaching Assistants (TAs). The campus fees are \$266.61 for the 2013-14 academic year. TAs are responsible for paying this fee on time. Fees and insurance (except for campus fees) are paid for MS students who are employed as TAs. MS students who are TAs are responsible for paying the non-resident tuition and campus fees by the fee payment deadline. All fees (fees, tuition and insurance) are normally paid for students who are employed as Research Assistants. The Registrar will assess a \$50 late fee for any student who pays the fees for which they are responsible after the deadline.

A break down of the 2013-14 fees can be found on the Registrar's website (<http://www.registrar.ucsb.edu/>).

Graduate Student Lab (GSL)

The GSL is located in trailer 698 (right outside Harold Frank Hall) and is the primary open access lab provided for Computer Science graduate students. A small number of workstations as well as space to use your laptops are provided. A printer is available for your use. If you find that the paper is out, you can obtain more paper in the main office (2104 HFH). If you experience any problems with the equipment in the GSL, please email support@cs promptly.

Students are encouraged to use this space to meet with fellow students. There is also a data projector installed for students to practice presentations. In order to insure the protection of our equipment, it is very important that students lock all doors and windows when leaving the GSL.

Mailboxes

All graduate students have a mailbox located in the Graduate Student Lab (GSL). Mailboxes are identified by number, not name. Your mailbox number has been provided to you in your welcome packet. This number will remain the same throughout your tenure in the department. Please check your mailbox on a regular basis. Any mail we receive for you as well as correspondence from the department will be placed in your mailbox. We do not hold student mail in the administrative office. Students should not provide the departmental address for receipt of bank statements or other private information as the mailboxes are not locked.

Lockers

A small number of lockers are available on the first floor of Harold Frank Hall. Unfortunately, the department does not have enough lockers to give every student their own. Anyone hoping to obtain a locker will be placed in a lottery. If you secure a locker, it is yours to keep throughout your tenure in the department. If you should find that you no longer need the locker, we ask you to let us know so that it can be given to another student.

Copy Machine

Two copy machines are available in 2108 Harold Frank Hall for your use. You have been provided in your welcome packet a five-digit copy code to use for your personal copies. This code will remain the same throughout your tenure in the department. The department charges \$.03 per copy; \$.06 for double sided copies. A monthly statement of due charges will be placed in your mailbox each month. Please pay your due charges in a timely manner.

Fax Machine

A fax machine is available for your use in 2108 Harold Frank Hall. Graduate students may use the code 7894 to access the machine. A clipboard is provided to record the faxes that you send. You will be charged the cost of the call. A monthly statement of due charges is placed in your mailbox each month. Please pay your due charges in a timely manner.

Employment and Financial Support

Teaching Assistants (TAs)

The department accepts applications for Teaching Assistants each quarter. The application website (<http://www.cs.ucsb.edu/department/jobs/taapp/>) is available approximately one month prior to the beginning of the quarter. Priority for employment is given to first and second year Ph.D. students. All fees (fees, tuition and insurance) except for the campus fees are normally paid for Ph.D. students who are employed as TAs. The campus fees are \$266.61 for the 2013-14 academic year. TAs are responsible for paying this fee on time. Fees and insurance (except for campus fees) are paid for MS students who are employed as TAs. MS students who are TAs are responsible for paying the non-resident tuition and campus fees by the fee payment deadline.

In order to qualify for a TA position in Computer Science, students must complete CS 501 (Techniques of Computer Science Teaching). This is a one unit seminar offered every fall by the lead TA. CS 502 (Teaching of Computer Science) is a variable unit course available to students employed as TAs in the CS department only. Students may add these units to maintain the required 12 unit course load without adding another course.

It is not uncommon for graduate students to find TA positions in other departments such as Physics, Statistics and the College of Engineering. Students should contact these departments directly to enquire about available positions. Students employed in other departments are not eligible to add CS 502.

Research Assistants (RAs)

It is anticipated that Ph.D. students will transition to Research Assistantships during their second year. Students are hired by their research advisors to conduct research in the lab. All fees, tuition and insurance are paid for students employed as RAs at 35% time or greater.

International students who are employed as TAs or RAs must complete tax and visa information on GLACIER prior to the beginning of fall. This will only need to be completed once while you are at UCSB.

Fellowships

There are several fellowships for which the department annually nominates students. These fellowships include the Microsoft Research Fellowship, the IBM Ph.D. fellowship and a number of centrally administered university fellowships. Students interested in being considered for these awards should talk to their research advisors about a nomination.

The Graduate Division offers a number of fellowships for which students may apply after the first year at UCSB. These fellowships include research grants and a dissertation year fellowship. Information about funding opportunities can be found at <http://www.graddiv.ucsb.edu/financial/cont.htm>. The Graduate Division offers a mailing list regarding extramural funding opportunities. You can subscribe at <http://www.graddiv.ucsb.edu/source/>.

If you are receiving a fellowship stipend, checks can be picked up in the BARC office 1 week prior to the first day of instruction. Stipend checks will be released only if you have a zero balance on your BARC account. Students can also sign up to have stipend checks directly deposited into a bank account. See the BARC office for more information.

Graduate Division Travel Grants

The Graduate Division has travel grants available to doctoral students who have advanced to candidacy and who have been invited to present a research paper at a scholarly meeting, or to present the results of research before a distinguished audience. Students are eligible to receive support for one trip during their scholarly career. Applicants must be registered or on an approved leave of absence. Student applications for travel funds must be accompanied by an abstract of the paper to be presented, a copy of the formal invitation, and a letter of support from the student's advisor indicating the importance of the forum. The conference must be an important one to the discipline; preference will be given to travel associated with potential academic employment. Funds are limited; applications are accepted year-round until funds are expended or until May 15, whichever occurs first. For information and the application form, see <http://www.graddiv.ucsb.edu/pubs/#fn>.

Need Based Financial Support

Graduate students that are U.S. citizens or eligible non-citizens may apply for federal financial aid by submitting the Free Application for Federal Student Aid (FAFSA). This application can be submitted on-line at www.fafsa.ed.gov. Direct Loans, Grad PLUS Loans, and Work-Study are available through this process. While students may submit this application throughout the year for loan eligibility, graduate students wishing to be considered for Work-Study must submit their FAFSAs each year by the Financial Aid Office's priority filing deadline of March 2 for the upcoming academic year.

Eligibility for these aid programs is determined by comparing the students' cost of attendance to their Student Contributions calculated from their FAFSA data. For more information, go to <http://www.finaid.sa.ucsb.edu/Budget.asp>.

Free Application for Federal Student Aid (FAFSA)

All domestic students are asked to complete the FAFSA each year by the March 2nd deadline. Although you may not receive need-based financial support, much of the money we receive from the University is based on the demonstrated need of our students. Completing this form will help the department qualify for more university support.

International Students

English as a Second Language (ESL) Requirements

All incoming international graduate students and permanent residents whose first language is not English must meet proficiency requirements in spoken and written English before registering at UCSB unless they have received an exemption from the Graduate Division. Students who have completed an undergraduate degree from an institution where English is the primary medium of instruction are exempt from both the oral and written portions of the ELPE. This required exam is held prior to the beginning of each quarter. Based on the performance on the ELPE students are placed in a compulsory ESL class with coursework aimed at helping improve the student's English. Students who do well are exempted-out of ESL. Students are expected to complete the ESL course progression within three quarters and cannot graduate until ESL requirements are completed. Students who fail the ELPE must register for and attend a prescribed ESL course and will have their registration blocked for future quarters until they re-take the ELPE and pass.

Teaching Assistant Language Evaluation

Graduate Council policy requires all prospective teaching assistants (TAs) whose first language is not English to take the TA Language Evaluation in order to be certified to hold sole classroom teaching or laboratory responsibilities. Students not certified during the TA language evaluation are required to complete ESL coursework to improve their spoken English. The student will have to show sufficient improvement in speaking proficiency to be certified. This may require more than one quarter of ESL coursework. Each student in a required ESL course is re-evaluated for certification by a committee of ESL faculty at the end of the quarter.

Office of International Students and Scholars (OISS)

OISS is available to assist and advise international students with all matters related to visas and immigration. They also provide information on housing, health care, employment, financial aid, cross-cultural programs and English conversation classes. Questions about OPT and CPT should be directed to OISS. Students are advised to stay in contact with OISS with any issues related to visa status. You can visit their website at <http://www.oiss.ucsb.edu/index.aspx>.

Students on non-immigrant visas may apply for President's Work Study through OISS after three quarters of enrollment at UCSB. This program allows international students to compete for on-campus jobs. If you receive President's Work Study and are employed by the Computer Science department, please bring your award letter to the Financial Office (2107 HFH) so that your work study can be processed. Information regarding this program can be found at <http://www.oiss.ucsb.edu/Home/PWSAppl2008.aspx>.

Other Important Information

Establishing California Residency

The Residence Deputy in the Office of the Registrar determines the residency of each student after the student has been accepted for admission. The decision is based on the review of the student's Statement of Legal Residence (SLR). Adult students (at least 18 years of age) may establish residency for fee purposes in California if they are a U.S. citizen, permanent resident or other immigrant, or a nonimmigrant that is not precluded from establishing a domicile in the U.S. This includes non-immigrants who hold valid visas of the following types: A, E, G, H1, H4, I, K, L, N, NATO, O1, O3, R, or V. Adult students cannot derive residence from a spouse or parents. All eligible non-resident students are encouraged to apply for CA residency after the first year at UCSB. Information regarding establishing residency can be found on the Registrar's website at <http://www.registrar.ucsb.edu/>.

Transfer of Credit

With approval from the department and the Graduate Division, up to 8 quarter units of credit for courses completed with a grade of B or better may be transferred from an accredited college outside the UC system. Up to 12 quarter units may be transferred from another UC campus. Transferred units are treated as Pass/Not Pass upper division units and are not computed into the UCSB grade point average, with the exception of courses completed through concurrent enrollment in UCSB Extension. Graduate courses may be transferred to UCSB if the student was in a graduate program when the courses were completed; however, units counted for a degree already awarded by another institution are not transferable.

If you have courses you wish to be considered for transfer, you should provide a syllabus and/or course description to a faculty member in the department who teaches a course of similar material. The course need not be an exact equivalent of a course at UCSB but must be found to be comparable to graduate level courses in the department. The transfer course must be approved by 1) the "owner" of the course at UCSB, 2) your faculty advisor, and 3) the Graduate Affairs Committee.

An official Graduate Student Petition must be completed to count transfer credit towards an MS degree. For rules about counting courses taken at another university towards the PhD course requirement see page 22.

Incomplete Grades

The grade Incomplete (I) may be assigned when a student's work is of passing quality but is incomplete. A completed Petition for an Incomplete Grade must be returned to the Office of the Registrar by the last day of the quarter for an I grade to be placed on a student's record. Petitions must be signed by the instructor, and are available in the Office of the Registrar. A \$5.00 processing fee will be billed to the student's BARC account. The deadline for completion of coursework for incomplete grades is the end of the quarter following the quarter the I grade was received. Unless the work is completed and a grade is reported to the Office of the Registrar by the deadline, the I will be changed automatically to fail.

Intercampus Exchange Program

The purpose of the Intercampus Exchange Program for Graduate Students (IEPGS) is to provide access during fall, winter, or spring quarter to courses at another University of California campus not ordinarily available at UCSB. IEPGS allows eligible graduate students from the "home campus" - UCSB - to visit another UC campus - the "host campus" - for one quarter at a time to take classes in their major or language courses not available at UCSB. UCSB students may also use facilities or resources not available at UCSB or study with a professor in their field at another UC campus as long as they are enrolled in independent study units at the host campus through IEPGS. Applicants to IEPGS must have good academic credentials and cannot use IEPGS as a "back door" to a campus that previously denied them admission. This program is limited only to the other UC campuses.

For information about applying to IEPGS please see the Graduate Division website at <http://www.graddiv.ucsb.edu/academic/petitions/applyingIEPGS.htm>.

Time to Degree

The normative time in the Computer Science department is two years for a Master's degree, three years from beginning graduate study at UCSB to advance to doctoral candidacy, and five years for a Ph.D. When a student exceeds time standards for advancing to candidacy or completing the doctoral degree, the department will deliver written notification to the student that he or she has exceeded time standards set by the department and approved by Graduate Council. An academic progress plan will be required. The student will remain on departmental progress monitoring status for the remainder of the academic year or until the student advances or graduates within the academic year. A student is not eligible for central merit fellowships if they are beyond time to degree expectations.

If a student does not advance to candidacy or graduate at the end of the academic year, the student will be placed on formal academic probation. If a student does not advance or graduate after one year on probation, the student is subject to academic disqualification.

A student on academic probation is not eligible to hold a graduate student academic appointment or to receive central fellowship support.

Academic Probation

A student who fails to maintain a cumulative GPA of 3.0 in a given quarter is placed on academic probation and sent a written notice to that effect by the Graduate Dean, with a copy to the department. When the sub-standard cumulative GPA occurs for a second quarter, the Department Chair or Graduate Advisor is consulted and asked to recommend and justify (a) continued academic probation or (b) academic disqualification. A student may also be placed on academic probation if the Department finds the student is not meeting departmental expectations of performance and progress.

Leave of Absence

UCSB requires continued registration of all graduate students until the student completes all degree requirements. In extraordinary circumstances, however, students who have registered for and completed at least one quarter and are in good standing,

may petition for a leave of absence subject to certain conditions. A leave of absence guarantees persons a place in their degree program upon return from their approved leave and allows limited access to some University resources during the period the student is approved for leave. Students making extensive use of University resources or faculty time must register.

Types of Leave of Absence:

- Medical/Health Difficulties
- Pregnancy/Parenting Needs
- Family Emergency Leave
- Military Leave
- Filing Quarter Leave

A Leave of Absence will not be granted for the following reasons:

1. Financial hardship and the desire to not pay fees
2. Desire to take "time off" from the pressure of studies
3. The necessity to focus primary energies on examination preparation or thesis/dissertation completion
4. Exigencies resulting from outside employment
5. Desire to protect visa status

For information regarding applying for a leave of absence, please see the Graduate Division website at <http://www.graddiv.ucsb.edu/academic/petitions/applyLOA.htm>.

Filing Fee Leave

Students must be in a fee paying relationship with the University in order to complete a degree. Normally this means registration during the academic year. Fees paid in spring quarter allow a student to complete the degree during the summer without additional registration requirements. Students who are completing one final requirement for a degree may apply for a Filing Fee Quarter of Leave, which allows them to maintain a relationship with the University by paying the filing fee instead of enrolling. The filing fee is to be used only by students who have completed all other requirements for the degree and will not be holding a student appointment title or extensively using University resources or faculty time. Those who plan to continue working at the University should not use this status, but remain registered.

The filing fee is one half the amount of the registration fee. Students should pay the filing fee the day they actually file for a degree, no sooner. Students should be cautioned about unrealistic expectations about finishing. Should the student not, for any reason, file the thesis or dissertation or pass the comprehensive examination during the approved filing fee quarter, the student must register for the quarter during which final degree requirements are met.

In Absentia Registration

Graduate students whose research or study requires them to remain outside California for the duration of a quarter can take advantage of *In Absentia* registration.

Students may apply for In Absentia registration under the following circumstances:

- * Doctoral students who have advanced to candidacy by the time the in absentia status would begin.

- * Master's students who have completed at least one year of coursework by the time in absentia status would begin.

- * Special cases within the above two categories can be approved only by exception at the discretion of the Graduate Dean.

- * Students who seek in absentia registration beyond the initial term must reapply for each subsequent year.

Students shall be assessed the following fees while registered in absentia:

- * 15 percent of the combined education, registration, and campus fees. This reduced fee assessment reflects that in absentia students have less access to UC resources than do other UC students, but continue to utilize some level of advising and other University resources to facilitate timely academic progress toward degree completion. <http://www.registrar.ucsb.edu/feereduction.htm>

- * The full health insurance fee with the UC campus of origin. Students registered in absentia will have access to student health centers and all other benefits associated with their student health insurance plan.

- * Nonresident tuition, if applicable.

Students will be eligible to apply for and receive University fellowships and research assistantships, but not teaching assistantships during the in absentia period.

Ph.D. Degree Requirements

The purpose of the Doctor of Philosophy program in Computer Science is to prepare students for research and teaching positions in universities and colleges, and for research and leadership positions in industry and government. The primary aim of the program is to train students in the methods of scientific inquiry and independent research. This is accomplished through advanced coursework and active participation with the faculty in their research programs. Doctor of Philosophy students are expected to have a broad knowledge of all fields of computer science and have a deep understanding of at least one of its areas. In addition to this requirement, a Doctor of Philosophy student must be up to date in all the developments in his/her major area of specialization. The most important component of the Doctor of Philosophy program is learning to perform independent and significant research in one's area of specialization.

Requirements for the Doctor of Philosophy degree typically are completed in four to five years, depending on whether or not a student enters the program with an M.S. in computer science.

Timeline for Ph.D.

- **Year 1:** First, students should make progress towards completing the Ph.D. course requirements. In most cases, this means taking between 4 and 6 courses in the first year. However, a student could justify taking less than 4 courses by making superior progress in research. Second, students should make progress in starting research work and finding a research advisor. Students typically begin by identifying a set of potential faculty advisors and working with those faculty members to initiate a research project. Students should take a minimum of four 596 units (research units) to be introduced to research and to assist in finding a research advisor. Students are also expected to take the two unit 595 Faculty Research Seminar. Third, students who are TAs must have good teaching evaluations. And fourth, students should participate in CS department activities such as seminars, colloquia, etc.
- **Year 2:** Students are expected to have found a research advisor. Students should make progress towards completing the Ph.D. course requirement and the Major Area Exam.
- **Year 3:** Students are expected to have completed the Ph.D. course requirement and passed the Major Area Exam. Students should make progress towards completing their dissertation proposal.
- **Year 4 and beyond:** Students are expected to have completed their dissertation proposal. Students are expected to continue making progress towards finishing their dissertation and graduating.

Course Requirements

To ensure sufficient breadth at the graduate level, Ph.D. students must complete at least 8 graduate courses (four by the end of their first year) with a GPA of at least 3.5, and a grade in each course of at least 3.0. The 8 courses must include

at least two courses each in two of the three areas (systems, applications, foundations) and one course in the third area.

The set of courses that students plan to take must be endorsed by their academic advisor and the Graduate Advisor. Students have to file a petition to count a graduate course taken at another university towards the PhD course requirement. A graduate course taken at another university can be counted towards the PhD course requirement if 1) endorsed by the academic advisor, 2) endorsed by a Department of Computer Science Faculty who is teaching a corresponding graduate course and 3) approved by the Graduate Affairs Committee. Students should provide a course syllabus or description to be reviewed and endorsed by the academic advisor and the course owner. Counting more than two courses taken at another university towards the PhD course requirement is discouraged.

An approved study plan must be on file to complete the Ph.D. Study plans may be picked up in the Computer Science Office, HFH 2104, or found here: www.cs.ucsb.edu/graduate/resources.

The following courses only count for the **Theory/Foundations** requirement for the Ph.D.:

CS 209	Logic and Applications in Computer Science
CS 216	Level Set Methods
CS 220	Theory of Computation and Complexity
CS 225	Information Theory
CS 230	Approximations, NP-Completeness and Algorithms
CS 231	Topics in Combinatorial Algorithms
CS 234	Randomized Algorithms
CS 235	Computational Geometry
CS 260	Advanced Topics in Program Analysis
CS 266	Formal Specification and Verification
CS 267	Automated Verification

The following courses only count for the **Systems** requirement for the Ph.D.:

CS 254	Advanced Computer Architecture
CS 263	Modern Programming Languages and Their Implementation
CS 270	Advanced Topics in Operating Systems
CS 271	Advanced Topics in Distributed Systems
CS 272	Software Engineering
CS 273	Data and Knowledge Bases
CS 274	Advances Topics in Database Systems
CS 276	Advanced Topics in Networking
CS 279	Advanced Topics in Computer Security
CS 284	Mobile Computing

The following courses only count for the **Applications** requirement for the Ph.D.:

CS 211A	Matrix Analysis and Computation
CS 211B	Numerical Simulation

CS211C	Numerical Solution of Partial Differential Equations—Finite
Difference Methods	
CS 211D	Numerical Solution of Partial Differential Equations—Finite
Element Methods	
CS 219	Sparse Matrix Algorithms
CS 240A	Applied Parallel Computing
CS 265	Advanced Topics in Machine Intelligence
CS 280	Computer Graphics
CS 281B	Advanced Topics in Computer Vision

Finding a Research Advisor

Students in the PhD program are encouraged to find a research advisor within the first year of the Ph.D. program. Students who have not found a research advisor within the first two years of the Ph.D. program are considered to be making unsatisfactory progress and may lose financial support.

As a first step in finding a research advisor, students should contact faculty and meet with them to discuss their research interests. Students who are interested in working with a faculty member should consider taking a class with that faculty member, attending research seminars (CS 595), or proposing to do an independent study project (CS 596). Also, attending MS and PhD exams of students supervised by a faculty member is a great way to learn about the current research interests of that faculty member. During the winter quarter, each faculty member gives a short presentation on his or her research in the Faculty Research Seminar. Attendance in this seminar is required for first year graduate students. This seminar provides a great opportunity for learning about the research interests of the faculty. In general, attending both technical events (such as CS 595 seminars, departmental colloquia, annual graduate student workshop, PhD major area exams, PhD proposals, PhD defenses, MS defenses) and social events (such as coffee hours, picnics and cookouts) are helpful for learning about the ongoing research in the Department.

Students who are having problems contacting faculty or finding research opportunities, should meet and discuss these problems with their academic advisor or the Graduate Advisor.

Forming a Committee

After finding a research advisor and selecting an area of research, a student forms a doctoral committee to supervise dissertation research. The research advisor serves as the chair of the doctoral committee. The doctoral committee must be chaired by a ladder faculty member from the Department and should include a minimum of 3 UC ladder faculty; 2 (including the chair) must be in Computer Science, although faculty from other UCSB departments may also be members. In special circumstances, non-UCSB faculty may be members. The committee is officially formed by submitting a Form I to the Graduate Division. Any changes to your committee after it has been officially formed require completion of a Committee Form 1-A, Changes in Thesis or Dissertation Committee with the Graduate Division.

Conflict of Interest

The Form I Committee Nomination form also includes a Conflict of Interest (COI) policy that must be signed by the student and their advisor. This policy is in

place to protect our students. Please see the Graduate Division COI website for more information. http://www.graddiv.ucsb.edu/academic/coi/COI_QandA.pdf

Exam Requirements

Major Area Exam (Qualifying Exam)

After the doctoral committee approves a student's proposed major area, a major area examination tests the student's knowledge of this area and any necessary supporting areas. As a part of this oral examination, a student submits a set of relevant papers from the major area and prepares a brief presentation. Passing this examination allows this student to advance to candidacy for the doctoral degree. The department strongly advises students to complete their major area exam by the end of their third year. Students should have a signed study plan at the time of the major area exam.

Several weeks before the exam, students should see Jillian Title to secure a room. One week before the exam, the title and abstract for the major area exam should be sent to Jill to circulate to the department.

Proposal

After passing the major area examination, a student prepares a dissertation proposal that describes the dissertation topic, summarizes the relevant background literature, and presents a comprehensive research plan for the doctoral dissertation. The thesis proposal examination determines the feasibility of the research plan and the appropriateness of the research topic. The department strongly advises students to complete their proposal by the end of their fifth year, and at least one year before their anticipated dissertation defense.

Several weeks before the proposal, students should see Jillian Title to secure a room. One week before the exam, the title and abstract for the proposal should be sent to Jill to circulate to the department.

Dissertation Defense

The final examination is the defense of the candidate's dissertation, which consists of a public seminar and an evaluation by the candidate's doctoral committee on whether the student has successfully defended the dissertation.

Scheduling the proposal and the dissertation exams too close to each other is discouraged. The dissertation and the proposal exams should be separated at least by one quarter.

Several weeks before the defense, students should see Jillian Title to secure a room. One week before the exam, the title and abstract of your dissertation should be sent to Jill to circulate to the department.

Filing Your Dissertation

The Graduate Division provides a *Guide to Filing* which outlines all policies and procedures regarding the dissertation. It can be found on the Graduate Division website (www.graddiv.ucsb.edu/pubs/filingguide.htm).

Annual Review

A key component of our Ph.D. Program is that each student will undergo a yearly evaluation by the Graduate Affairs Committee during each spring quarter. The goal of these evaluations is to give each student a fair and honest assessment of their progress in the Ph.D. Program. Students making excellent progress are recognized, and students in need of assistance beyond what is normally offered by the Department are given individualized counseling.

As part of this process, each student completes a detailed but brief accounting of their accomplishments during the past year (e.g. courses taken, independent study projects completed, efforts to find an advisor, papers submitted/published, talks given, teaching assistant evaluations, etc.). This information, along with an assessment by each student's advisor is reviewed by the Graduate Affairs Committee. After being reviewed and discussed by the faculty, each student will receive a letter with the faculty's assessment. Any recommendations for improvement are passed along to the student's advisor for discussion and planning a course of action. Students who have not made sufficient progress are put on probation or given an unsatisfactory review. Students on probation are required to be re-evaluated at the end of the next quarter.

This evaluation process is seen as very valuable by both faculty and students. For the faculty, the review is an opportunity to assess students and the research they are doing. For the students, it is an opportunity to get advice and a progress evaluation from a larger group of faculty than their own advisor. Students who receive satisfactory reviews can be confident that the faculty feel they are making good progress toward successfully completing their Ph.D. studies.

Optional Emphases

Computational Science and Engineering

The Computational Science and Engineering (CSE) emphasis focuses on the integration of techniques and methodologies from Computer Science and Mathematics, for the solution of state-of-the-art, large-scale problems from science and engineering. The emphasis is offered in the Departments of Computer Science, Chemical Engineering, Electrical and Computer Engineering, Mechanical Engineering, Mathematics, and Geological Sciences. Students electing the CSE emphasis pursue a Master's or Ph.D. degree in their home department and take core and elective CSE courses. For more information please visit the CSE website, <http://www.cse.ucsb.edu>.

Technology and Society

The Technology and Society emphasis is designed for students whose interests involve technology and society, and who seek perspectives from disciplines other than their own. Faculty teaching in the program come from several disciplines including: Anthropology, Communication, Computer Science, English, History, Media Arts and Technology, Political Science, and Sociology. For more information, please read their website at <http://www.cits.ucsb.edu>.

Cognitive Science

The Cognitive Science emphasis provides an opportunity for students to participate in an interdisciplinary field at the intersection of a number of existing

disciplines, such as psychology, linguistics, computer science, philosophy, and neuroscience, focused on the study of cognition – thinking, learning, and intelligence. Cognitive Science seeks to understand the processes and representations underlying intelligent action. Faculty in the program come from several departments. For program requirements and other information about the emphasis, visit the Cognitive Science program website at <http://www.cogsci.ucsb.edu/>.

Diplomas

Diplomas and transcripts are ordered through the Registrar. An official diploma takes about 4-6 months to receive; an official transcript with your degree posted can take 1 to 2 months. Graduate Division can furnish you or a prospective employer with an official letter of degree verification that will satisfy most employers, until an official transcript can be secured.

Master of Science Degree Requirements

The purpose of the Master of Science program is to provide advanced training in computer science to prepare students for positions in industry and government and for further graduate study. The program is designed to accommodate students with training in diverse scientific and engineering disciplines, and in this regard the graduate program relies on the undergraduate program to provide the necessary course work for graduate students with deficiencies in their computer science backgrounds.

Study Plan

Upon entry into the graduate program, students are assigned an academic advisor who guides them through their graduate career. In consultation with his/her academic advisor, each student prepares a study plan which details the courses that will be taken in order to fulfill the course requirements. The study plan may be changed at any time with the approval of the student's faculty advisor and the graduate advisor. While the rules of the Graduate Division describe the conditions under which a student may withdraw from a course, the Department imposes the additional condition that if a student withdraws from a course that affects the study plan, then a new study plan must be prepared prior to withdrawal. An approved study plan must be on file to complete the M.S.

Requirements for the Master of Science

Students may complete the Masters by choosing one of three available tracks—thesis, comprehensive exam or project. The core requirements for all three tracks are the same:

- 42 units of upper-division (excluding 193 level courses) or graduate courses (200+, 595, 596, 598) that are approved by a Computer Science Faculty Advisor must be completed.
- A major area must be chosen from three major areas -- Theory, Systems, and Applications. Four CS graduate courses (200 level) should be taken from the major area and one CS graduate course (200 level) must be taken from each of the other two areas. The same course cannot be used to satisfy both major area and breadth requirements.
- The grade in each major area course must be at least a B.
- At least two units and at most six units of 595 seminar units must be included in the unit requirements.
- The study plan must be approved by the faculty advisor.

Additional Requirements for Thesis

The student must submit an acceptable thesis, completed under the supervision of a Computer Science permanent faculty member, and approved by a thesis committee composed of 3 UC ladder faculty; two of which (including the Chair of the committee) must be Computer Science ladder faculty. At most 12 units of 596 and 598 can be used towards unit requirements.

A public defense of the thesis is required.

Additional Requirements for Comprehensive Examination

Besides the six courses required for all plans, twelve additional units of coursework must be completed with 100 (excluding 193) and 200 level courses. Of these, eight units must be at the 200 level.

The comprehensive examination will be offered twice a year, in the eighth week of the fall and spring quarters. Each student will list four graduate courses: a question from each of these courses will be asked on the examination. Three questions need to be correctly answered in order to pass. If a student does not pass, s/he may take the exam the next time it is offered. Only two attempts will be allowed.

Additional Requirements for Project

The project plan requires more coursework than the thesis plan but less research, establishing a useful intermediate position between the other two plans. Beyond the major area and breadth courses common to all plans, the project plan's course requirements include two additional 200 level graduate courses. In addition to these course requirements, the student must complete:

- six units of 596 directed research.
- a project under the supervision of a Computer Science permanent faculty member. The project must be approved by a Project Committee consisting of two permanent faculty members of the Computer Science Department. Approval is based on the project's deliverables:
 - a report
 - a 30-minute public presentation describing the project.

Earning an MS on the Way to the Ph.D.

Ph.D. students wishing to receive an MS degree while working on the doctoral degree may do so at the proposal stage. The Project option requirements should be followed. All course work required for the Project option must be completed. The Ph.D. proposal will be considered the MS project.

Students should be sure to complete a graduate student petition to add the MS degree objective so that the MS can be awarded. The petition can be found at www.graddiv.ucsb.edu/pubs.

Courses used on the MS study plan can be used on the Ph.D. study plan as well.

M.S. Research Subject Areas

Theory / Foundations

Course	Course Title
CS 209	Logic and Applications in Computer Science
CS 216	Level Set Methods
CS 220	Automata-Based Complexity
CS 225	Information Theory
CS 230	Approximation, NP-Completeness and Algorithms
CS 231	Topics in Combinatorial Algorithms
CS 235	Computational Geometry
CS 260	Advanced Topics in Translation
CS 266	Formal Specification and Verification
CS 267	Automated Verification
CS 271	Advanced Topics in Distributed Systems
CS 273	Data and Knowledge Bases
CS 290	Various – see CS website for a list of 290s and the subject areas they cover for M.S. requirements only.

Systems

Course	Course Title
CS 240A	Applied Parallel Computing
CS 240B	Parallel Computing and Program Parallelization
CS 254	Advanced Computer Architecture
CS 260	Advanced Topics in Translation
CS 263	Modern Programming Language and Their Implementation
CS 266	Formal Specification and Verification
CS 270	Advanced Topics in Operating Systems
CS 271	Advanced Topics in Distributed Systems
CS 272	Software Engineering
CS 273	Data and Knowledge Bases
CS 274	Transaction Management in Distributed Databases
CS 276	Advanced Topics in Networking
CS 279	Network Security and Intrusion Detection
CS 284	Mobile Computing
CS 290	Various – see CS website for a list of 290s and the subject areas they cover for M.S. requirements only.

Applications

Course	Course Title
CS 211ABCD	Various
CS 216	Level Set Methods
CS 240A	Applied Parallel Computing
CS 240B	Parallel Computing and Program Parallelization
CS 265	Advanced Topics in Machine Intelligence
CS 272	Software Engineering
CS 274	Transaction Management in Distributed Databases
CS 279	Network Security and Intrusion Detection
CS 280	Computer Graphics
CS 281B	Advanced Topics in Computer Vision
CS 290	Various – see CS website for a list of 290s and the subject areas they cover for M.S. requirements only.

Academic Conduct

It is expected that students attending the University of California understand and subscribe to the ideal of academic integrity, and are willing to bear individual responsibility for their work. Any work (written or otherwise) submitted to fulfill an academic requirement must represent a student's original work. Any act of academic dishonesty, such as cheating or plagiarism, will subject a person to University disciplinary action. Using or attempting to use materials, information, study aids, or commercial "research" services not authorized by the instructor of the course constitutes cheating. Representing the words, ideas, or concepts of another person without appropriate attribution is plagiarism. Whenever another person's written work is utilized, whether it be a single phrase or longer, quotation marks must be used and sources cited. Paraphrasing another's work, i.e., borrowing the ideas or concepts and putting them into one's "own" words, must also be acknowledged. Although a person's state of mind and intention will be considered in determining the University response to an act of academic dishonesty, this in no way lessens the responsibility of the student.