

UCSB Computer Science



Graduate Student Handbook

2018-19

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Important Contacts

Chair:

Matthew Turk

mturk@cs.ucsb.edu

Graduate Vice Chair:

Elizabeth Belding

ebelding@cs.ucsb.edu

Graduate Advisors:

Elizabeth Belding

ebelding@cs.ucsb.edu

Divyakant Agrawal

agrawal@cs.ucsb.edu

Student Services:

Nicole McCoy, Student Affairs Mgr.

nicolem@cs.ucsb.edu

Benji Dunson, Graduate Matters

benji@cs.ucsb.edu

Elijah Baker, Undergraduate Matters

ebaker@cs.ucsb.edu

Technical Support:

support@engineering.ucsb.edu

Important Locations

Chair's Office	2104 Harold Frank Hall
Student Affairs Office	2104 Harold Frank Hall
Financial Services Office	Trailer 698
Faculty Mailboxes	2108 Harold Frank Hall

Computer Science Faculty

<u>Faculty</u>	<u>Email(@cs.ucsb.edu)</u>	<u>Office</u>
Divyakant Agrawal distributed systems and databases	agrawal	HFH 3117
Kevin Almeroth computer networks and protocols, large-scale multimedia systems, performance evaluation and distributed systems	almeroth	HFH 2113
Elizabeth Belding mobile networking, wireless networks and protocols, multimedia systems, performance evaluation, wireless solutions for developing regions	ebelding	HFH 5107
Tevfik Bultan model checking, concurrency, web services, static analysis, software engineering	bultan	HFH 2123
Phillip Conrad computer science education, computer networks and communication, multimedia computing, transport protocols, web technologies	pconrad	HFH 1113
Yufei Ding programming languages and software engineering	yufeiding	HFH 1123
Omer Egencioglu bijjective and enumerative combinatorics, parallel algorithms, approximation algorithms, combinatorial algorithms	omer	HFH 2115
Amr El Abbadi information systems, databases, fault-tolerant distributed systems	amr	HFH 3115
Yu Feng programming languages and software engineering	yufeng	T.B.A

Frederic Gibou	fgibou	Eng II 2334
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		
John R. Gilbert	gilbert	HFH 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	HFH 2119
multimessage multicasting, VLSI placement and routing algorithms, scheduling theory; design and analysis of algorithms		
Trinabh Gupta	trinabh	HFH 1121
operating systems & distributed systems. security & cryptography		
Benjamin Hardekopf	benh	HFH 1109
programming languages: design, analysis and implementations		
Tobias Höllerer	holl	HFH 2155
human computer interaction, computer graphics, virtual and augmented reality, wearable and ubiquitous computing		
Kate Kharitonova	ykk	T.B.A.
computer vision and machine learning. multimedia processing and understanding, Image correspondence, and effective image alignment through fitting geometric models.		
Chandra Krintz	ckrintz	HFH 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	HFH 1117
computer and network security, malware detection, websecurity, program analysis, operating systems		
Rachel Lin	rachel.lin	HFH 1153
cryptography, security, foundations and algorithms		
Daniel Lokshtanov	daniello	HFH 2109
Algorithms & theory		
Diba Mirza	dimirza	HFH 1155
Embedded systems with application to cyber-physical systems		
Linda R. Petzold	petzold.	BioEng 3106

computational science and engineering, multiscale numerical simulation, systems biology

Tim Sherwood	sherwood	HFH 5163
computer architecture, dynamic optimization, network and security processors, embedded systems, program analysis and characterization, hardware support of software systems		
Ambuj Singh	ambuj	HFH 3119
bioinformatics, databases, parallel and distributed systems		
Jianwen Su	su	HFH 2161
database systems and applications, web services		
Subhash Suri	suri	HFH 2111
algorithms, internet computing, computational geometry		
Stefano Tessaro	tessaro	HFH 1117
cryptography, security, foundations and algorithms		
Matthew Turk	mturk	HFH 2163
computer vision, human computer interaction, perceptual user interfaces, imaging systems		
Wim van Dam	vandam	HFH 2151
quantum computation, quantum algorithms, quantum communication, quantum information theory		
Giovanni Vigna	vigna	HFH 2159
computer and network security, network models and protocols, mobile code languages and systems, mobile agent security		
Richert Wang	richert	HFH 1151
Parallel and distributed systems, specifically in system design, resource management, and routing mechanisms		
William (Yang) Wang	william	HFH 1115
human centered and social computing, machine learning and data mining		
Yu-Xiang Wang	yuxiangw	HFH 2121
machine learning and data mining		
Yuan-Fang Wang	yfwang	HFH 3113
computer vision, computer graphics, artificial intelligence		
Richard Wolski	rich	HFH 5165
distributed systems, computational grid computing, on-line performance forecasting		
Lingqi Yan	lingqi	HFH 2119

Computer Science Staff

Name		Email (@cs.ucsb.edu)	Phone
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Administrative Staff

Departmental Affairs

Greta Halle	Business Officer	greta	7038
Samantha Oglesby	Asst to Chair	svoglesby	2207

Student Affairs

Nicole McCoy	Student Affairs Manager	nicolem	4323
Benji Dunson	Graduate Advising	benji	4322
Elijah Baker	Undergraduate Advising	ebaker	4321

Financial Affairs

Sheryl Montoya	Financial Manager	smontoya	5283
Genevieve Singer	Financial Administrator	gsinger	5284
John Huber	Contracts and Grants	jhuber	3418
Maya Wang	Payroll Administrator	maya.wang	6438
Kyle Hekuis	Contracts and Grants	khekhuis	3418

Technical Staff

Questions regarding technical support should always be sent to:
support@engineering.ucsb.edu

Computer Science Research

Algorithms and Theory

Foundations of Computing, Geometric and Graph Algorithms, Data Structures, Quantum Computing, Cryptography, Complexity Theory, Information Theory.

Labs: Center for Geometric Computing

Faculty: Subhash Suri, Ömer Egecioğlu, Teofilo F. Gonzalez, Wim van Dam, John Gilbert, Huijia (Rachel) Lin, Stefano Tessaro

Computational Science and Engineering

Computational algorithms and software tools for data mining, data analysis, linear algebra, large-scale graph computations, high performance computing, partial differential equations, and multi-scale stochastic simulation. Applications to systems biology, ecology, energy, materials, fluids, and social science.

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

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

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

Labs: Computer architecture lab (ArchLab)

Faculty: Tim Sherwood

Computer Science Education and Diversity

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

Labs: Center for Computing Education and Diversity

Faculty: Phillip Conrad, Kate Kharitonova, Diba Mirza, Richert Wang

Database and Information Systems

Distributed databases, fault-tolerance distributed systems, data in the cloud, multimedia databases, spatial databases, data mining, search, data-centric processes, workflow, data-aware services.

Labs: Distributed Systems Lab, Dynamic Network: Analysis and Modeling (Dynamo) Lab, Information Systems and Engineering Lab (ISEL)

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

Human Centered and Social Computing

Modeling social behavior and computational systems.

Labs: Four Eyes Lab, NLP Lab, MOMENT Lab

Faculty: Elizabeth Belding, Tobias Hollerer, Ambuj Singh, William Wang, Xifeng Yan

Machine Learning and Data Mining

Knowledge representation, natural language processing, pattern recognition, and intelligent systems, with applications in many areas including bioinformatics, business intelligence, information retrieval, security, and network science.

Labs: Dynamic Networks: Analysis and Modeling (Dynamo) Lab, Four Eyes Lab, Network Science Lab, NLP Lab

Faculty: Ambuj K. Singh, Xifeng Yan, Matthew Turk, Linda Petzold, Tobias Höllerer, William Wang

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.

Labs: MOMENT Lab, Networking and Multimedia Systems Lab

Faculty: Kevin Almeroth, Elizabeth Belding, Arpit Gupta

Operating Systems and Distributed Systems

Large-scale systems, cloud computing, distributed databases, distributed programming environments and runtime systems, Internet-scale analytics, social networks.

Labs: Distributed Systems Lab, RACE Lab

Faculty: Divyakant Agrawal, Amr El Abbadi, Ambuj K. Singh, Rich Wolski, Tao Yang, Trinabh Gupta

Programming Languages and Software Engineering

Static and dynamic techniques for automated software verification and program analysis, adaptive compilation and runtime, language-based security, resource and energy consumption prediction, program profiling, formal methods, web services, workflows, concurrent and distributed systems

Labs: ArchLab, Computer Security Lab, Information Systems and Engineering Lab, Programming Languages Lab, RACE Lab, Verification Lab
Faculty: Tefvik Bultan, Ben Hardekopf, Jianwen Su

Security and Cryptography

Network and system security, web security, security of social networks, malware analysis, voting system security, vulnerability analysis, language-based security, specification and verification of systems, security-enhanced microprocessors.

Labs: Computer Security Lab, Verification Lab , ArchLab

Faculty: Richard A. Kemmerer, Giovanni Vigna, Stefano Tessaro, Huijia (Rachel) Lin, Christopher Kruegel, Tefvik Bultan, Timothy Sherwood, Trinabh Gupta

Visual Computing and Interaction

Human-computer Interaction, computer vision, virtual and augmented reality, 3D modeling, computer graphics, visualization, scientific and information, wearable and ubiquitous computing

Labs: Four Eyes Lab, Vision Research Lab , Computer Vision Research Lab, AlloSphere Research Facility

Faculty: Tobias Höllerer, Matthew Turk, Yuan-Fang Wang

Getting Started

Registration

Continuous registration is required of all graduate students (please see page 20 for information about approved leaves). 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 (Gaucho 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), independent research units (500 level) or seminars (595s).

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 by the department for Ph.D. students who are employed as Teaching Assistants (TAs). The campus fees are \$328 for the 2018-19 academic year. ***TAs are responsible for paying this fee on time.*** In-state 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 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 breakdown of the 2018-19 fees can be found on the Registrar's website <http://registrar.sa.ucsb.edu/fees-residency/fee-information/summary-of-quarterly-fees-and-expenses>

Graduate Student TA Office

The TA office is located in trailer 936 and is the primary place for TAs to hold office hours. Keys are available from Benji in HFH 2104.

It is very important that students lock all doors and windows when leaving the office!

Copy Machine

Two copy machines are available in 2108 Harold Frank Hall for your use. Please email Benji@cs.ucsb.edu for a copy code. Provide the course number for which you need the copier.

Employment and Financial Support

Teaching Assistants (TAs)

The department accepts applications for Teaching Assistants each quarter. The application website <https://apps.cs.ucsb.edu/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 \$328 for the 2018-19 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.

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 inquire about available positions and to find out which fees are covered by that department. If a student is a TA or Reader in another department, Computer Science is not responsible for any fees. 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. To remain in good academic standing with the department and retain eligibility for continued departmental funding, a Ph.D. student **MUST** secure a research advisor by the end of their second year.

Fellowships

There are several fellowships for which the department annually nominates students. These fellowships include the Microsoft Research Fellowship, the IBM Ph.D. Fellowship, Google 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>.

If you are receiving a fellowship stipend, checks can be picked up in the BARC office one week prior to the first day of instruction fall quarter.

It is recommended to go sign up with BARC 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/financial/other-ucsb-fellowships>

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 for Multilingual Student (EMS) 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. This required exam is held prior to the beginning of each quarter. New Ph.D. international students are expected to take the exams prior to the start of fall quarter of their arrival. The staff graduate advisor will schedule the exams. Based on the performance on the ELPE, if students don't pass or receive a conditional pass, they are placed in a compulsory EMS class with coursework designed to improve the student's English. Students are expected to complete the EMS course progression within three quarters and cannot graduate until EMS requirements are completed. Students who fail the ELPE must register for and attend a prescribed EMS 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 EMS 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 EMS coursework. Each student in a required EMS course is re-evaluated for certification by a committee of EMS 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://oiss.sa.ucsb.edu/>.

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 (Trailer 698) so that your work study can be processed.

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 parent. All eligible non-resident students are required 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 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. Once you have the agreement of the course "owner" at UCSB and your faculty advisor, send the corresponding materials and approvals to Benji in the CS office, where it will then be sent to the Graduate Affairs Committee for review.

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. If the work is not completed and a grade is not 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/forms-petitions/intercampus-exchange-eap#iepgs>

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 six 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. An academic progress plan will be required to proceed with degree completion. 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.

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/forms-petitions>

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 should instead 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://registrar.sa.ucsb.edu/feereduction.aspx>
- 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 (Ph.D.) 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. Ph.D. 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 Ph.D. student must be up to date in all the developments in his/her major area of specialization. The most important component of the Ph.D. program is learning to perform independent and significant research in one's area of specialization.

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

Timeline for Ph.D., and Requirements for Remaining in Good Academic Standing:

- **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 fewer 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 potential faculty advisor and working with that faculty member to initiate a research project. Students must take a minimum of four 596 units (research units) to be introduced to research and to assist in finding a research advisor. Students must also take the two-unit 595N Faculty Research Seminar, typically offered in Winter quarter. 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, and ideally to be supported either on fellowship or as a Graduate Student Researcher (GSR). Students should make progress towards completing the Ph.D. course requirement and the Major Area Exam (MAE). Students are recommended to complete the MAE by the end of their second year.
- **Year 3:** Students are expected to have completed the Ph.D. course requirement and strongly advised to have passed the Major Area Exam. Students should make progress towards completing their dissertation proposal and publishing in prestigious research conferences and journals in their research field.
- **Year 4:** Students are expected to have completed their dissertation proposal. Students are expected to continue making progress towards

finishing their dissertation and graduating.

- **Year 5:** Students are strongly advised to have completed their dissertation proposal. Students should be nearing graduation.
- **Year 6:** Students are expected to complete their dissertation and the defense.

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 remaining five courses can be selected from other graduate courses offered by the department, and in some cases, from other departments are needed to advance research.

The set of courses that students plan to take must be endorsed by their research advisor and the Graduate Advisor. As described in the Transfer of Credit section (p. 17), students may file a petition to count a graduate course taken at another university towards the Ph.D. course requirement.

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: <https://www.cs.ucsb.edu/education/grad/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
CS 290	Special Topics
CS 292	Special Topics

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
CS 290	Special Topics
CS 293	Special Topics

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

CS 211A	Matrix Analysis and Computation
CS 211B	Numerical Simulation
CS 211C	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
CS 290	Special Topics
CS 291	Special Topics

Finding a Research Advisor

Students in the Ph.D. 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 Ph.D. 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, most faculty members give a short presentation on his or her research in the Faculty Research Seminar (CS 595N). Attendance in this seminar is required for first year Ph.D. 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/summit.cs, Ph.D. major area exams, Ph.D. proposals, Ph.D. 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 or co-chair of the doctoral committee. The doctoral committee must be chaired or co-chaired by a ladder faculty member from the Department and should include a minimum of 3 UC Academic Senate Members; 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

All degree milestones (MAE, Proposal, and Defense) require a unanimous decision by the student's doctoral committee to pass. If the decision is not unanimous, the committee will decide what the student must do to pass.

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 (approximately 50 minutes) 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 to remain in good academic standing. Students should have a signed study plan at the time of the major area exam.

Several weeks before the exam, students should see the staff graduate advisor to secure a room. One week before the exam, the title and abstract for the major area exam should be sent to Benji 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 in order to remain in good academic standing, and at least one year before their anticipated dissertation defense.

Several weeks before the proposal, students should see Benji Dunson to secure a

room. One week before the exam, the title and abstract for the proposal should be sent to Benji 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, and ideally at least one year.

Several weeks before the defense, students should see Benji Dunson to secure a room. One week before the exam, the title and abstract of your dissertation should be sent to Benji 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 <http://www.graddiv.ucsb.edu/academic/Filing-Your-Thesis-Dissertation-DMA-Document>

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. Unsatisfactory reviews result in loss of good academic standing.

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 in addition to 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/>.

Bioengineering

The bioengineering emphasis includes structured curriculum aimed at teaching biology to physical scientists at several levels (molecular, cellular, and tissue) as well as both a student-run and invited seminar series aimed at providing a community for students engaged in bioengineering related research on campus. Courses are open to all graduate students interested in bioengineering. For requirements and more information, go to <http://bioengineering.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 (M.S.) 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.

M.S. 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 M.S.

Students may complete the M.S. 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.
- 595N: Faculty Research Seminar (Winter quarter) does not count toward this requirement.
- 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 Academic Senate Members, two of which (including the Chair or Co-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. The comprehensive exam is closed to all supplemental assistance material, i.e. books, notes, etc. 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:

- (a minimum of) 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 M.S. on the Way to the Ph.D.

Ph.D. students wishing to receive an M.S. 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 M.S. project. Students should be sure to complete a graduate student petition to add the M.S. degree objective so that the M.S. can be awarded. The petition can be found at <http://www.graddiv.ucsb.edu/docs/default-source/academic-services-documents/changedegpetition-3-2018.pdf?sfvrsn=0> Courses used on the M.S. 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 290	Special Topics – See CS website and/or Advising Office
CS 292	Special Topics

Systems

Course	Course Title
CS 254	Advanced Computer Architecture
CS 263	Modern Programming Language 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	Transaction Management in Distributed Databases
CS 276	Advanced Topics in Networking
CS 279	Network Security and Intrusion Detection
CS 284	Mobile Computing
CS 290	Special Topics – See CS website and/or Advising Office
CS 293	Special Topics

Applications

Course	Course Title
CS 211A	Matrix Analysis and Computation
CS 211B	Numerical Simulation
CS 211C	Numerical Solution of Partial Differential Equations—Finite Difference Methods
CS 211D	Numerical Solution of Partial Differential Equations—Finite Element Methods
CS 240A	Applied Parallel Computing
CS 265	Advanced Topics in Machine Intelligence
CS 279	Network Security and Intrusion Detection
CS 280	Computer Graphics
CS 281B	Advanced Topics in Computer Vision
CS 290	Special Topics – See CS website and/or Advising Office
CS 291	Special Topics

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.

Where to go for Assistance

2104 Harold Frank Hall

Degree requirements

- Registration questions
- Employment questions
- Personal concerns that you may not feel comfortable discussing with your faculty advisor
- Anything you have questions about!

<http://www.cs.ucsb.edu/benji@cs.ucsb.edu>, nicolem@cs.ucsb.edu

Office of International Students and Scholars (OISS)

- Visa questions
- Employment eligibility questions
- CPT
- OPT

<http://oiss.sa.ucsb.edu/>

Office of the Registrar

- Fee information
- Residency questions
- Annual and quarterly calendars and deadlines
- Gold registration system questions

<http://registrar.sa.ucsb.edu/>

Graduate Division

- Forms and petitions
- Campus-wide policies for graduate students
- Career & Professional Development
- Awarding of degrees

<http://www.graddiv.ucsb.edu/>

Graduate Students' Association (GSA)

- Campus-wide graduate student committees
- Social activities
- Workshops: interviewing, dissertation filing, financial
- Additional resource information for grad students

<http://www.gsa.ucsb.edu>

<http://www.cs.ucsb.edu/~greps/>

UCSB Multicultural Center

- Social activities
- Lectures
- Films

<http://mcc.sa.ucsb.edu/home>

Counseling Services

- Psychologists and peer stress advisors
 - Group counseling sessions
 - Relaxation rooms
- <http://caps.sa.ucsb.edu/>

Women, Gender and Sexual Equity Department

- Resource Center for Sexual and Gender Diversity
- △ Women's Center
- Confidential support
- Annual events
- Outreach and education
- The David Bohnett Cyber Center
- Resource Library

<http://wgse.sa.ucsb.edu/>

Orfaea Family Children's Center

- Child care services (3 mths-5 years)
- Tuition subsidies
- Family support and outreach referral program

<http://childrenscenter.sa.ucsb.edu/>

Disabled Students Program (DSP)

- Services and accommodations for students with disabilities
- Assists in providing academic or physical accommodations
- Students are responsible for providing DSP with appropriate documentation

<http://dsp.sa.ucsb.edu/>

Ombuds

- Conflict management
- Confidential
- University related complaints, including academic concerns

<https://ombuds.ucsb.edu/>

UCSB Career Services

- Advising, Programming, and Workshops geared specifically toward graduate students

<http://career.sa.ucsb.edu/gradstudents>

Arts And Lectures

- Performing arts events
- Artists, dancers, theater, filmmakers, lecturers
- Open to the public
- Discounted tickets for students

<http://artsandlectures.sa.ucsb.edu/>

UCSB's Family Resource Website

<https://www.myfamily.ucsb.edu/>