

UCSB Computer Science



Graduate Student Handbook

2021-22

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Important Contacts

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Graduate Vice Chair Chandra Krintz	ckrintz@cs.ucsb.edu
Faculty Graduate Advisor Divyakant Agrawal	agrawal@cs.ucsb.edu
Student Services Maritza Fuljencio, Student Affairs Manager	cs-sam@ucsb.edu
Graduate Matters - Current Students	cs-gradprogram@ucsb.edu
Graduate Matters - Admissions	gradhelp@cs.ucsb.edu
Undergraduate Matters	cs-undergrad@ucsb.edu
Technical Support	help@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
Prabhanjan Ananth cryptography, and more broadly theoretical computer science	prabhanjan	HFH 1119
Jonathan Balkind computer architecture, operating systems and distributed systems, programming languages and software engineering	jbalkind	HFH 1115
Elizabeth Belding mobile networking, wireless networks and protocols, multimedia systems, performance evaluation, wireless solutions for developing regions	ebelding	HFH 5107
Michael Beyeler bionic vision, computational neuroscience, computer vision and machine learning, human computer interaction, virtual and augmented reality	mbeyeler	BioE 3210B
Tevfik Bultan model checking, concurrency, web services, static analysis, software engineering	bultan	HFH 2159
Shiyu Chang machine learning and data mining, computer vision, human centered and social computing	chang87	HFH tbd
Shumo Chu databases and information systems, formal methods, applied cryptography	shumo	HFH 2153
Phillip Conrad computer science education, computer networks and communication, multimedia computing, transport protocols, web technologies	pconrad	HFH 1113
Wim van Dam quantum computation, quantum algorithms, quantum communication, quantum information theory	vandam	HFH 2163
Yufei Ding programming languages, software engineering	yufeiding	Henley Hall 2007
Amr El Abbadi information systems, databases, fault-tolerant distributed systems	amr	HFH 3115
Yu Feng	yufeng	HFH 2157

programming languages, software engineering

Frederic Gibou fgibou ENG II 2335
computational mathematics, modeling and simulations - materials science, multiphase flows, level-set methods, ghost-fluid methods, and interface problems, 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

Arpit Gupta arpitgupta HFH 1117
machine learning and data mining, networking, security and cryptography

Trinabh Gupta trinabh HFH 1121
operating systems and distributed systems, security and 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 HFH 1153
computer vision and machine learning, multimedia processing and understanding, image correspondence, effective image alignment through fitting geometric models

Chandra Krintz ckrintz Henley Hall 2009
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 2117
computer and network security, malware detection, web security, program analysis, operating systems

Lei Li lilei HFH 2121
natural language processing, machine learning, data mining, AI for drug discovery

Daniel Lokshantov daniello HFH 2109
algorithms and 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 Henley Hall 2011
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

Misha Sra sra HFH 2151
virtual, augmented and mixed reality, perception and illusion, machine learning, novel sensing and stimulation devices, natural interaction, multiuser systems, immersive gaming

Jianwen Su su HFH 2161
database systems and applications, web services

Subhash Suri suri HFH 2111
algorithms, internet computing, computational geometry

Giovanni Vigna vigna HFH 2156
computer and network security, network models and protocols, mobile code languages and systems, mobile agent security

Eric Vigoda vigoda HFH 2113
randomized algorithms

Richert Wang richert HFH 1151
parallel and distributed systems, specifically in system design, resource management, and routing mechanisms

William (Yang) Wang william Henley Hall 2005
human centered and social computing, machine learning and data mining

Yu-Xiang Wang yuxiangw Henley Hall 2013
machine learning and data mining

Yuan-Fang Wang yfwang HFH 3113
computer vision, computer graphics, artificial intelligence

Richard Wolski rich Henley Hall 2015
distributed systems, computational grid computing, on-line performance forecasting

Lingqi Yan lingqi HFH 2119
computer graphics, mainly aimed at rendering photo-realistic visual appearance at real world complexity.

Computer Science Staff

<u>Name</u>	<u>Title</u>	<u>Email (@ucsb.edu)</u>	<u>Phone</u>
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Administrative Staff

Departmental Affairs

Greta Halle	Business Officer	halle	7038
TBA	Assistant to Chair	TBA	2207

Student Affairs

Maritza Fuljencio	Student Affairs Manager	cs-sam	4323
Karen van Gool	Graduate Advising	cs-gradprogram	4322
Selena Martinez	Undergraduate Advising	cs-undergrad	4321

Financial Affairs

Sheryl Montoya	Financial Manager	scondino	5283
TBA	Financial Administrator	purchasing@cs.ucsb.edu	5284
John Huber	Contracts & Grants Manager	jhuber	3418
TBA	Contracts & Grants	TBA	3245
Jamie Fletcher	Contracts & Grants	jfletcher	3245
Crystal Lua	Payroll Administrator	clua	6438

Technical Staff

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

Computer Science Research

Algorithms and Theory

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

Labs: Theory Lab

Faculty: Prabhanjan Ananth, Subhash Suri, Wim van Dam, John Gilbert, Daniel Lokshantov, Eric Vigoda, Yu-Xiang Wang

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, Bionic Vision Lab

Faculty: Michael Beyeler, Frederic Gibou, John Gilbert, Lei Li, 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: Jonathan Balkind, Yufei Ding, 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: Amr El Abbadi, Divyakant Agrawal, Shumo Chu, Ambuj K. Singh, Jianwen Su, Xifeng Yan, Tao Yang

Human Centered and Social Computing

Modeling social behavior and computational systems.

Labs: Four Eyes Lab, NLP Lab, MOMENT Lab, Perceptual Engineering Lab

Faculty: Elizabeth Belding, Shiyu Chang, Tobias Höllerer, Lei Li, Ambuj Singh, Misha Sra, 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: Shiyu Chang, Yufei Ding, Tobias Höllerer, Lei Li, Linda Petzold, Ambuj K. Singh, William Wang, Yu-Xiang Wang, Xifeng Yan

Networking

Computer networks and protocols, large-scale multimedia systems, mobile and wireless networks, quality of service, network modeling and simulation, high-performance mobile computing, network security, network models and protocols, network measurement, network management, self-driving networks, programmable networks.

Labs: MOMENT Lab, Networking and Multimedia Systems Lab, RACE Lab, Systems and Networking Lab (SNL)

Faculty: Elizabeth Belding, Arpit Gupta, Trinabh Gupta, Subhash Suri

Operating Systems and Distributed Systems

Large-scale systems, cloud and edge computing, distributed databases, distributed programming environments and runtime systems, Internet-scale analytics, social networks, intelligent sensing, Internet-of-Things.

Labs: Distributed Systems Lab, RACE Lab, Systems and Networking Lab (SNL)

Faculty: Amr El Abbadi, Divyakant Agrawal, Jonathan Balkind, Elizabeth Belding, Arpit Gupta, Trinabh Gupta, Chandra Krintz, Ambuj K. Singh, Rich Wolski, Tao Yang

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: Jonathan Balkind, Tevfik Bultan, Shumo Chu, Yufei Ding, Ben Hardekopf, Chandra Krintz, 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, applied cryptography.

Labs: Computer Security Lab, Verification Lab, ArchLab, Systems and Networking Lab (SNL)

Faculty: Prabhanjan Ananth, Tefvik Bultan, Shumo Chu, Arpit Gupta, Trinabh Gupta, Christopher Kruegel, Timothy Sherwood, Giovanni Vigna

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, Bionic Vision Lab, Perceptual Engineering Lab

Faculty: Michael Beyler, Shiyu Chang, Tobias Höllerer, Pradeep Sen, Misha Sra, William Wang, Yuan-Fang Wang, Lingqi Yan

Getting Started

Registration

Continuous registration is required of all graduate students (please consult the UCSB Graduate Division website for the most up to date information on 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 a student has been unregistered, or lapsed in status, for a period of one quarter or longer, in order to engage in educational opportunities at UCSB, or to be awarded a degree, the student must petition for an opportunity to reinstate to graduate status. 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 (<https://registrar.sa.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. There are no waivers of the late fee charge for students that miss the on-time registration deadline.

The Computer Science department requires all students to register for 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 fifteenth day of instruction each quarter to add a class. After this date, a schedule adjustment petition is required along with justification for the late course addition. 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 for graduate students are due the first day of instruction of every academic quarter (i.e., Fall/Winter/Spring). All fees (fees, tuition and insurance) *except for the campus-based fees* are normally paid for PhD students who are employed as Teaching Assistants (TAs). TAs are responsible for paying their campus-based fees on time. In-state tuition/fees and insurance (except for campus-based fees) are paid for MS students who are employed as TAs. MS students who are TAs are responsible for paying the Non-Resident Supplemental Tuition (NRST) and campus-based fees by the fee payment deadline. All fees are normally paid for students who are employed as Graduate Student Researchers (GSRS) at 35% time or more. 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 annual fees can be found on the Registrar's website.

Graduate Student TA Office

The TA office is located in Trailer 936 (next to Phelps Hall) and is the primary place for TAs to hold office hours. Keys are available from the CS SGPA (Staff Graduate Program Advisor) in HFH 2104. It is very important that students lock all doors and windows when leaving the office!

Copy Machines and Scanners

Two copy machines are available in 2108 Harold Frank Hall (HFH) for your use for photocopies and scanning. Please visit 2104 HFH for a code for these machines.

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 two months prior to the first day of instruction for each quarter. Employment priority is given to first- and second-year PhD students. All fees (tuition, fees, and insurance) except for the campus-based fees are normally paid for PhD students who are employed as TAs. TAs are responsible for paying the campus-based fee on time. Tuition/fees and insurance (except for campus-based fees) are paid for MS students who are employed as TAs. MS students who are TAs are responsible for paying the Non-Resident Supplemental Tuition (NRST) and campus-based fees by the fee payment deadline.

In order to qualify for a TA position in Computer Science, students must register for and complete CS 501 (Techniques of Computer Science Teaching). New graduate students who are first-time TAs will take this course concurrent with their first TA assignment. This is a one-unit seminar offered every Fall quarter by the CS 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 must submit an Eligibility Verification form to the CS Student Affairs Manager, and students employed in other departments are not eligible to add CS 502.

Graduate Student Researchers (GSRs)

It is anticipated that PhD students will transition to Graduate Student Researcher (GSR) positions during their second year. Students are hired by their research advisors to conduct research in the lab. All tuition, fees, and insurance are paid for

students employed as GSRs at 35% time or greater. To remain in good academic standing with the department and retain eligibility for continued departmental funding, a PhD student MUST secure a research advisor by the end of their second year.

Fellowships

There are several PhD fellowships for which the department annually nominates students. These fellowships include the Microsoft Research Fellowship, the IBM PhD 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 PhD 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 <https://www.graddiv.ucsb.edu/our-services/student-financial-support>.

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 highly recommended to sign up with BARC to have stipend award checks directly deposited into a bank account i.e., BARC's eRefund system. See the BARC office website for more information.

Graduate Division Travel Grants

The Graduate Division has travel grants available for doctoral students who have advanced to candidacy (i.e. who have successfully completed their MAE and degree requirements) 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:

<https://www.graddiv.ucsb.edu/our-services/other-campus-fellowships>

Need-based Financial Support

Graduate students that are U.S. citizens or eligible non-citizens are encouraged to 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 <https://www.finaid.ucsb.edu/cost-of-attendance>.

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 international graduate students are expected to take the exams (ELPE) prior to the start of fall quarter of their arrival. The staff Graduate Program Advisor (SGPA) 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 retake 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. Please note that students who are not certified cannot be hired as TAs. If you are a PhD student with financial support, you will be hired as a Reader (grader), instead of a TA, until you are certified. 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 Optional Practical Training (OPT) and Curricular Practical Training (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 <https://oiss.ucsb.edu/>.

Students on non-immigrant visas may apply for the President's Work Study program through OISS after three quarters of enrollment at UCSB. This program allows international students to compete for on-campus jobs. If you receive a President's Work Study award 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 before the start of their second year at UCSB.** Failure to do so leads to expensive financial questions for a student and/or a faculty member's grant. Please carefully read all information provided to you and follow all directions carefully. As a public university, UC is very serious about its residency requirement. Please note that UCSB's Residence Deputies are the only UCSB staff permitted to advise students on residency requirements. Information regarding establishing residency can be found on the UCOP Residency's website at <https://www.ucop.edu/residency/faq.html>

Transfer of Credit

The CS Department has two ways of handling course transfers. One applies to MS students, and the other to PhD students. This is because MS students must officially transfer courses, via petition, with the University. For PhD students, rather than a course *transfer*, you are requesting a course *exception*.

MS Students

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 a course you wish to be considered for transfer, you will need to complete the General Graduate Student Petition. To begin the process, via email you should provide a syllabus and/or course description to a faculty member in the department who teaches a course of similar material. Email messages should all be cc'd to the SGPA (cs-gradprogram@ucsb.edu). 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 Advising and Affairs Committee (GAC). Once you have the agreement of the course "owner" at UCSB and your faculty advisor, send the corresponding materials and

approvals to the SGPA in the CS office, where it will then be sent to the GAC for review. A grade of B or equivalent must have been obtained in the transferred course in order for it to be considered for transfer. Please also make sure you have an up-to-date MS Study Plan Worksheet on file, indicating how this course will be used to fulfill your course requirements. It is preferred that courses not taken at UCSB only be used to fulfill elective requirements (vs. as area requirements, although this is possible). Once the GAC approves and signs the petition, the petition and required official transcripts will be submitted to the Graduate Division for their review.

In addition, an MS student is permitted to take graduate courses from other departments on campus in order to fulfill elective requirements, provided they have approval of the GAC (Graduate Affairs Committee). To request approval, please email the GVC (Graduate Vice Chair), with a cc to the SGPA, with the course number, title, and description to request this approval.

PhD Students

With the approval of the Computer Science department's Graduate Advising and Affairs Committee (GAC), a PhD student may petition for exceptions for up to 3 of their 8 required 200-level courses. These may be courses taken as part of a graduate program at another university, or from another department at UCSB. It is strongly preferred that you request exceptions for courses to fulfill electives over area requirements. This is an internal process and does not require approval from the Graduate Division.

To obtain approval to use a non-UCSB CS course to fulfill an elective requirement, you will start with an email to your doctoral advisor, with a cc to the SGPA (email address cs-gradprogram@ucsb.edu), in which you include the course department name & number, title, and description, as well as an explanation as to why this course is essential to your doctoral studies. If the course is from outside of UCSB you will need to also attach an unofficial transcript so that a grade equivalent of B or higher can be verified. In some cases your advisor may also request a syllabus in order to make their decision. Only your advisor approval is required to use outside courses to fulfill elective requirements. In addition, you must submit a current PhD Study Plan, with the approved courses listed as electives.

To obtain approval to use a non-UCSB CS course to fulfill an area requirement, the procedure has several additional requirements. This approval process is also carried out via email and messages should include a cc to the SGPA. To begin the process, you should write a paragraph explaining why this particular course is essential to your PhD studies. If it is a non-UCSB course, please provide a syllabus and 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 course exception must then be approved by 1) the "owner" of the course at UCSB, 2) your faculty advisor, and 3) the GAC. If the course is a UCSB course from another department, you may skip getting approval from the course "owner" but steps 2 and 3 still apply. Once you have the agreement of the course "owner" at UCSB (if applicable) and your faculty advisor, send the corresponding materials and approvals

to the SGPA in the CS office, where it will then be sent to the GAC for review. A grade of B or equivalent must have been obtained in the requested course in order for it to be considered for fulfilling one of your course requirements. Verification of course grade must be submitted to the GAC. In addition, you must submit a current PhD Study Plan, with the approved courses listed as you intend to use them to fulfill your degree requirements.

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 on the Office of the Registrar's website. 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 an "F."

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's website:

<https://www.graddiv.ucsb.edu/forms/intercamp-ed-abroad-and-cross#iepgs>

Time-to-Degree Standards

MS students in the CS department typically complete their degree within two years, however all MS students at UCSB are allotted 4 years to complete their degree. In addition, all MS students must complete a minimum of 3 quarters in order to qualify for their degree.

Normative time, or Time-to-Degree (TTD) standards, for PhD students are more complicated. For the CS department, PhD students are expected to Advance to Candidacy (by successfully completing the MAE, required coursework, and the TA requirement) in 3 years, or by the end of their 9th quarter. PhD students have six years (18 quarters) to complete their degree. When a PhD student exceeds time standards for advancing to candidacy or completing the doctoral degree, they will

be notified by the Graduate Division. An Academic Progress Plan will be required to proceed with degree completion. The student will remain on 'Monitoring' progress 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. There are additional financial implications for international students who exceed TTD standards.

If a student on a progress plan does not advance to candidacy or graduate at the end of the academic year, the student will be placed on formal academic 'Probation' status. If a student does not advance or graduate after one year on Probation, the student is subject to academic disqualification. A student on Probation is not eligible to hold a graduate student employment appointment or to receive central fellowship support.

PhD students must complete a minimum of 6 registered quarters in order to receive their degree.

Academic Probation

Any graduate student who fails to establish and 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 Faculty 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 Probation if the CS department finds the student is not meeting departmental expectations of performance and progress.

The Graduate Division's full policy regarding Time-to-Degree Standards, Academic Probation, and Academic Disqualification can be found in the Academic Performance and Progress page of their website:

<https://www.graddiv.ucsb.edu/policy-procedure/academic-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 personal leave of absence. 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.

From the Graduate Division's website:

- A student may request a personal leave for any personal reason that they encounter that limits their capacity to enroll and make progress towards

their degree. Students are eligible for 3 quarters of personal leave but could request up to 3 more quarters with the Graduate Dean's approval.

- No additional documentation is needed in support of the leave request, unless the student is requesting beyond the first 3 quarters of leave.

For information regarding applying for a leave of absence, please see the Graduate Division website at <https://www.graddiv.ucsb.edu/forms/leave-absence>

Filing Fee Leave of Absence

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 subsequent quarter(s) until the final degree requirements are met.

In Absentia Registration

Graduate students whose research or study is of a nature that requires them to remain outside of the local campus region (i.e, Santa Barbara, San Luis Obispo, and Ventura) for the duration of a quarter can take advantage of In Absentia registration.

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

- o PhD students who have advanced to candidacy (i.e., who have successfully completed their MAE and degree requirements) by the time In Absentia status begins.
- o MS students who have completed at least one year of coursework by the time In Absentia status would begin. MS students may be granted a maximum of 3 quarters of In Absentia registration.
- o Special cases within the above two categories can be approved only by exception at the discretion of the Graduate Dean.

- o PhD students who seek In Absentia registration beyond the initial 3 quarters allowed may reapply for an additional 3 quarters, with the additional 3 quarters requiring exception by the Graduate Dean.

Students shall be assessed the following fees while registered In Absentia:

- o 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. See: <https://registrar.sa.ucsb.edu/fees-residency/fee-information/fee-reduction>
- o 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.
- o Non-Resident Supplemental Tuition, if applicable.

Students will be eligible to apply for and receive University fellowships and GSR employment, but not Teaching Assistant employment during In Absentia periods.

Please see the Graduate Division's website for the full policy, eligibility requirements, and the required petition: <https://www.graddiv.ucsb.edu/forms/absentia>

PhD Degree Requirements

Purpose Statement

The purpose of the Doctor of Philosophy (PhD) 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. PhD 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 PhD student must be up to date in all the developments in their major area of specialization. The most important component of the PhD program is learning to perform independent and significant research in one's area of specialization.

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

Timeline for PhD, and Requirements for Remaining in Good Academic Standing:

- o Year 1: First, students should make progress toward completing the PhD 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 (4.0) CS 596, Directed Reading and Research, units to be introduced to research and to assist in finding a research advisor. Students must also take the two-unit (2.0) CS 595N Faculty Research Seminar, typically offered every Winter quarter. Third, students are required to TA at least one quarter, and must have good teaching evaluations. And fourth, students should participate in CS department activities such as seminars, colloquia, etc.
- o Year 2: Students are expected to have found a research advisor, and ideally to be supported either on a fellowship or as a Graduate Student Researcher (GSR). Students should make significant progress toward completing the PhD course and TA requirements. Year 2 students must review their PhD Study Plan with the SGPA in the Fall to make sure they are on track to complete all requirements before they complete their Major Area Exam (MAE).

- o Year 3: Students are required to complete their MAE by the end of Spring quarter of year 3. At the time of the MAE, all course and TA requirements must be completed and the student must have a completed and signed PhD Study Plan on file. Students should also make progress toward completing their dissertation proposal and submitting and publishing high-quality research papers (conferences and journals) in their research field.
- o Year 4: Students are expected to have completed their dissertation proposal. Students are expected to progress toward finishing their dissertation and graduating.
- o Year 5 (and beyond): Students are expected to have completed their dissertation and defended their thesis by the end of year 5 (or soon thereafter). Students should be nearing graduation.
- o Year 6: This is the final allowable year for CS PhD students before exceeding University time-to-degree (TTD) standards.

Graduate Class Level

In addition to full-time status, the instructional and fellowship funding that UC Santa Barbara receives for graduate education is dependent upon the class level of enrolled graduate students as determined by the Office of the Registrar. The Graduate Division also uses class level to determine funding eligibility. For these reasons, it is critical that students are aware of both the departmental TTD standards and the Registrar's class level designations.

Doctoral Degree Levels

- P1 status: Academic or professional doctorate degree objective, but not advanced to doctoral candidacy.
- P2 status: Academic or professional doctorate degree objective, and *has* advanced to doctoral candidacy (i.e. has successfully completed their MAE and degree requirements). P2 status lasts for 9 registered quarters.
- P3 status: After 9 registered quarters as P2 status, a student goes into P3 status. Students in P3 status are no longer eligible for central campus fellowship, though they may receive Block Grant funding as long as they remain within the time to degree standards for their academic program. P3 students can still be employed as long as they meet all other employment eligibility criteria.

International students who exceed 9 quarters in P2 status will be charged the full Non-Resident Supplemental Tuition (NRST). If you are hired as a GSR 35% or above, the funding source will be charged for your NRST, and you will see a credit for it on your student billing account (BARC). The TA, Associate, and Reader titles do not

automatically qualify for NRST reimbursement, thus the student is responsible for these charges when employed under these titles if the 9 quarter P2 limit is exceeded. This is also true for international students who exceed the 9 quarter P1 TTD limit to advance to candidacy (i.e., international students that do not pass their MAE and complete all course and TA requirements by the end of their Year 3).

Course Requirements

To ensure sufficient breadth at the graduate level, PhD students must complete at least 8 graduate courses offered by the Computer Science department (four by the end of their Year 1) 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 three courses can be selected from other graduate courses offered by the department, and in some cases, from other departments as needed to advance research.

The set of courses that students plan to take must be endorsed by their research advisor and the Faculty Graduate Advisor. As described in the Transfer of Credit section of this document, students may request an exception to count a graduate course taken at another university, or from another department at UCSB, toward the PhD course requirements.

An approved PhD Study Plan must be on file as part of completing the PhD degree requirements and advancing to candidacy. The PhD Study plan may be found here: <https://cs.ucsb.edu/education/graduate/resources>

Course Classifications by Area

Theory/Foundations Courses

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

Systems Courses

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

Applications Courses

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 PhD program are encouraged to find a research advisor within the first year of the PhD program. Students who have not found a research advisor within the first two years of the PhD 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 of each academic year, most faculty members give a short presentation on their research in the Faculty Research Seminar (CS 595N). Attendance in this seminar is required for first year PhD 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/CS Summit, PhD major area exams, PhD proposals, PhD defenses, and MS defenses) and social events (such as coffee hours and picnics) 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 faculty 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 Computer Science 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. Computer Science department Affiliated ladder faculty are permitted to serve as is if they were CS faculty members. CS ladder faculty in the LSOE employment track (i.e., Teaching Professors) may serve as Co-chairs, or as a member of a committee with at least two other non-LSOE CS ladder faculty, but not as a sole Chair of a committee. The CS faculty list can be found at <https://cs.ucsb.edu/people/faculty>. In special circumstances, non-UCSB faculty may be members. The committee is officially formed by submitting a Committee Form I to the Graduate Division. Any changes to your committee, once officially reported to the Graduate Division, require completion of a Committee Form I-A, Changes in Thesis or Dissertation Committee with the Graduate Division. These forms are prepared by the SGPA, generally at the time of your advancement

to candidacy exam (MAE) or, in the case of Form I-A, at the time of a degree milestone.

Conflict of Interest

The Committee Form I Nomination form also includes a Conflict of Interest (COI) policy that must be signed by the student and their research advisor. This policy is in place to protect our students. Please see the Graduate Division COI website for more information.

<https://www.graddiv.ucsb.edu/policy-procedure/policy-coi-education>

Industry Internships and Research Relationship

Our departmental policy is that a student enrolled in our PhD program can be paid by and work at a company as part of their PhD research pursuits, for a maximum of 2 academic quarters. The student, their advisor(s), and company must arrange an intellectual property (IP) agreement for the research performed during this time (such as the student is able to publish their research advances and make sufficient progress toward their PhD). The IP agreement should be done through the UCSB Office of Technology and Industry Alliances (TIA) and shared with (filed by) the SGPA. The student should be registered and enrolled in 12 research units (CS 596, Directed Reading and Research) each quarter spent at the company and must provide a brief report of the research activities and progress at the conclusion of each quarter, which will also be filed.

The department does not impose a limit on the number of summer internships that a PhD student can pursue. This decision is up to the student and their research advisor.

Beyond this, a faculty member can pursue a research gift or grant with the company which can be used to pay students as GSRs. This arrangement is subject to UC Conflict of Interest declaration, UC IP rules, and Office of Research oversight by the university (the standard for any/all industrial research funding that faculty pursue).

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 (MAE) (Qualifying Exam)

After the doctoral committee approves a student's proposed major area, a major area examination (MAE) 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 (called a "Reading List") 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 with the University. Students should have a completed and signed PhD Study Plan at the time of the MAE.

Several weeks before the exam, students should see the staff Graduate Program Advisor (SGPA) to secure a room. Seven to ten business days prior to the exam, the title, abstract, and list of doctoral committee members for the MAE must be sent to the SGPA to prepare required documents and to announce to the department.

Proposal

After passing the MAE, 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 dissertation 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 fourth year in order to remain in good academic standing with the University, and at least one year before their anticipated dissertation defense.

Several weeks before the Proposal, students should see the staff Graduate Program Advisor (SGPA) to secure a room. Seven to ten business days prior to the Proposal, the title, and abstract, and list of doctoral committee members for the Proposal must be sent to the SGPA to prepare required documents and to announce to the department. If your doctoral committee members have changed since declaring them at your MAE, please inform the SGPA at the time you schedule your Proposal, as new paperwork must be prepared for the Graduate Division in order to officially update this information with the university.

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 ideally be separated by a minimum of one year, but a minimum of one quarter separation is required.

You are required to submit a draft of your dissertation to your entire committee at least two weeks prior to your defense date.

Several weeks before the Dissertation Defense, students should see the staff Graduate Program Advisor (SGPA) to secure a room. Seven to ten business days prior to the Defense, the title, and abstract, and list of doctoral committee members for the Defense must be sent to the SGPA to prepare required documents and to announce to the department. If your doctoral committee members have changed since declaring them at your MAE (or since updating them at the time of your Proposal), please inform the SGPA at the time you schedule your Defense, as new paperwork must be prepared for the Graduate Division in order to officially update this information with the university.

Earning an MS on the Way to the PhD

PhD students wishing to receive an MS degree while working on the doctoral degree may do so at the PhD Proposal stage. The Project option requirements should be followed. All course work required for the Project option must be completed. If a PhD student has petitioned to use courses from a prior awarded MS degree, these courses cannot be used to fulfill requirements for the MS is CS at UCSB. The PhD proposal is considered equivalent to the MS Project. Students should be sure to complete a Change of Degree Status petition to add the MS degree objective. The petition can be found on the Graduate Division's website and should be submitted with the assistance of the SGPA.

<http://www.graddiv.ucsb.edu/docs/default-source/academic-services-documents/changedegpetition-3-2018.pdf?sfvrsn=0>

Filing Your Dissertation

The Graduate Division provides a *Guide to Filing* which outlines all policies and procedures regarding the dissertation. This guide, as well as everything you need to know about properly filing your dissertation, can be found on the Graduate Division website:

<https://www.graddiv.ucsb.edu/our-services/academic-services/filing/filing-your-thesis-dissertation-or-dma-supporting-document>

Annual Review

A key component of our PhD Program is that each student will undergo a yearly evaluation by the Graduate Affairs and Advising Committee (GAC) during each spring quarter. The goal of these evaluations is to give each student a fair and honest assessment of their progress in the PhD program. Students making excellent progress are recognized, and students in need of assistance beyond what is normally offered by the CS 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.). **A CS PhD student's annual participation in this process is mandatory.** This information, along with an assessment by each student's advisor, is reviewed by the GAC. 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 research advisor for discussion and planning a course of action. Students who have not made sufficient progress are given either a "Concerned" or "Unsatisfactory" review. Unsatisfactory reviews result in loss of good academic standing. Continued financial support beyond the second year is contingent upon remaining in good academic standing and making satisfactory progress toward the degree.

If a student is given a "Concerned" or "Unsatisfactory" letter and is not yet on Monitoring status with the Graduate Division, the CS department will submit an Academic Progress Plan to the Graduate Division, recommending a student be placed on Monitoring status. If a student does not meet the conditions outlined in

the Academic Progress Plan by the specified deadline, the CS department will then recommend Probation status to the Graduate Division.

The Graduate Vice Chair will follow-up and meet with the student by the end of each following quarter to check on the student's progress. If progress is being made, the student will be removed from Monitoring status, or downgraded from Probationary status to Monitoring status if on Probationary status. This process is repeated each quarter until the student decides to leave our program, the department chooses to take additional action, or the student is removed from Probationary or Monitoring status by the Graduate Division. All steps/meetings will be documented and placed in the student's file.

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 PhD studies.

Completing the annual PhD Progress review is not a substitute for completing the PhD Study Plan, and vice versa.

Optional Emphases

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/>.

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/>.

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 an MS or PhD degree in their home department and take core and elective CSE courses. For more information please visit the CSE website, <https://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>.

Diplomas

Diplomas and transcripts are ordered through the Office of 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. UCSB's 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 (MS) 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 makes use of some undergraduate program courses to provide a supplement for graduate students that may need additional support in their Computer Science backgrounds.

MS Study Plan

Upon entry into the graduate program, students are assigned a faculty *academic* advisor who guides them through their graduate career. In consultation with their 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 *research* advisor (if they have one) and the department's Faculty Graduate Vice Chair. An approved study plan must be on file to complete the MS degree in Computer Science.

Requirements for the MS

Students may complete the MS 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 CS 193 level courses) or graduate courses (CS 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 solid B or better.
- At least two units and at most six units of CS 595 seminar units must be included in the unit requirements. Note: CS 595 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 toward unit requirements. Please note: Teaching Faculty cannot serve as the sole chair of an MS or PhD committee, but can serve as a

Co-chair. Please see the departmental faculty list (<https://cs.ucsb.edu/people/faculty>) to identify which CS faculty are Teaching Faculty, designated with "Teaching" professor in their title.

A public defense of the thesis is required. Please see the Graduate Division website regarding how to properly format and file your thesis:

<https://www.graddiv.ucsb.edu/our-services/academic-services/filing/filing-your-thesis-dissertation-or-dma-supporting-document>

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. A "question" from each course may be, and often is, a multi-part question. Four questions will be presented at the time of the exam. The student selects three to complete. All three then must 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, they may take the exam the next time it is offered. Only two attempts will be allowed. It should be noted that this is an extremely challenging exam which requires ample and adequate preparation in all material presented for the course selected.

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 CS 596 directed research.
- Project completed under the supervision of a Computer Science ladder faculty member. The project must be approved by a Project Committee consisting of two permanent faculty members of the Computer Science Department. Please note that Teaching Faculty (LSOE titles) cannot serve as the sole chair of an MS or PhD committee, but can serve as a Co-chair. Please see the departmental faculty list on our website to identify which CS faculty are Teaching Faculty, designated with "Teaching" professor in their title.
- Approval is based on the project's deliverables:
 - a report
 - a 30-minute public presentation describing the project

To connect with faculty in order to follow the Project path, students should reach out to 1+ faculty members with whom they are considering working and ask explicitly what the expectations are (timeline, milestones, paper/writing expectations, amount of work (coding vs theory) etc). Students can ask faculty for examples of past MS projects, presentations, and papers/write-ups as that is a good way to get a good sense of the scope/expectations under a particular faculty. We also encourage students to pay to the degree milestone announcements that are sent to the grads listserv and attend as many MS Project Defense presentations as necessary to familiarize themselves with what a defense looks like (plus it's a great way to support your fellow students!).

MS Research Subject Areas and Course Classifications

Please see the list provided above for the PhD program as the course classifications do not change for MS students.

MS Students Who Wish to Pursue a PhD

Computer Science MS students who wish to pursue a PhD degree may apply for the PhD program via UCSB's annual online graduate student application, i.e., E-App. Unlike with PhD students adding the MS degree objective, this may not be done by petition. You must instead apply through the same process as you did when you first applied to the MS program, following published deadlines and application requirements. If your test scores have expired since you submitted them for your MS application you will need to retake the test. Please note that you may request a waiver of the TOEFL score. See the SGPA in HFH 2014 to make this request.

Please be sure to alert the SGPA that you are submitting your application for the PhD program. You should first secure a CS dissertation research advisor who is willing to support your PhD research before considering an application to the PhD program. Please also be aware that the GPA requirements for a PhD student are higher than those for an MS student. PhD students must complete at least 8 graduate courses offered by the Computer Science department (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 (solid B or better).

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 placing 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

Computer Science Department Administration

2104 Harold Frank Hall

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

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

Office of International Students and Scholars (OISS)

3130 Student Resource Building

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

- Visa questions
- Employment eligibility questions
- CPT
- OPT

Office of the Registrar

1101 Student Affairs and Administrative Services Building

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

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

Graduate Division

3117 Cheadle Hall

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

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

Graduate Student Resource Center

1215 Student Resource Building

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

- Career resources
- Professional development resources
- 'Grad Student Life' workshops & events
- Campus and community life for grad students

- Writing consultations
- One-on-one graduate academic counseling

Graduate Student Association

2502 University Center

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

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

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

UCSB Basic Needs & Resources

University Center

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

- SNAC (Student Needs & Advising Center)/Food Pantry
- Technology assistance
- Financial assistance

UCSB Multicultural Center

1504 University Center

<https://mcc.sa.ucsb.edu>

- Social activities
- Lectures
- Films

UCSB Counseling & Psychological Services (CAPS)

Building 599

<https://caps.sa.ucsb.edu/>

- Psychologists and peer stress advisors
- Group counseling sessions
- Massage chairs and egg chair

Mental Health Peer Program

Building 599

<http://www.ucsbmhp.com/>

- Peer stress advisors
- Coping and stress reduction tools
- Relaxation rooms

Women, Gender and Sexual Equity Department

1220 Student Resource Building

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

- Resource Center for Sexual and Gender Diversity
- Women's Center
- Confidential support

- Annual events
- Outreach and education
- The David Bohnett Cyber Center
- Resource Library

Orfalea Family Children's Center

UCSB West Campus

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

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

Disabled Students Program (DSP)

2120 Student Resource Building

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

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

Office of the Ombuds

1205-K Girvetz Hall

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

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

UCSB Career Services

Building 599

<https://career.ucsb.edu/grad-students>

- Advising, programming, and workshops geared specifically toward graduate students

Arts and Lectures

Box Office: Campbell Hall

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

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

Campus Advocacy, Resources, and Education (CARE)

Student Resource Building (SRB), first floor and/or

970 Embarcadero del Mar (Isla Vista location)

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

- 24 hour advocacy line: 805.893.4613

- Appointments
- Provides confidential advocacy and support to students, staff and faculty impacted by sexual assault, dating/domestic violence and stalking

Diversity, Equity, and Inclusion

4121 Cheadle Hall

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

Email: diversity-team@ucsb.edu

Shoreline

https://shoreline.ucsb.edu/home_login

- UCSB's official campus engagement platform
- Groups & Clubs
- Events
- News

California State Residency

<https://www.ucop.edu/residency/>

UCSB's Family Resource Website

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