UCSB
Computer Science
Graduate Student Handbook
2019-20
Table of Contents

Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table of Contents</td>
<td>2</td>
</tr>
<tr>
<td>Important Contacts</td>
<td>5</td>
</tr>
<tr>
<td>Important Locations</td>
<td>5</td>
</tr>
<tr>
<td>Computer Science Faculty</td>
<td>6</td>
</tr>
<tr>
<td>Computer Science Lecturers</td>
<td>9</td>
</tr>
<tr>
<td>Computer Science Emeriti Faculty</td>
<td>9</td>
</tr>
<tr>
<td>Computer Science Affiliated Faculty</td>
<td>9</td>
</tr>
<tr>
<td>Computer Science Staff</td>
<td>11</td>
</tr>
<tr>
<td>Administrative Staff</td>
<td>11</td>
</tr>
<tr>
<td>Technical Staff</td>
<td>11</td>
</tr>
<tr>
<td>Computer Science Research</td>
<td>12</td>
</tr>
<tr>
<td>Algorithms and Theory</td>
<td>12</td>
</tr>
<tr>
<td>Computational Science and Engineering</td>
<td>12</td>
</tr>
<tr>
<td>Computer Architecture</td>
<td>12</td>
</tr>
<tr>
<td>Computer Science Education and Diversity</td>
<td>12</td>
</tr>
<tr>
<td>Database and Information Systems</td>
<td>12</td>
</tr>
<tr>
<td>Machine Learning and Data Mining</td>
<td>13</td>
</tr>
<tr>
<td>Networking</td>
<td>13</td>
</tr>
<tr>
<td>Operating Systems and Distributed Systems</td>
<td>13</td>
</tr>
<tr>
<td>Programming Languages and Software Engineering</td>
<td>13</td>
</tr>
<tr>
<td>Security and Cryptography</td>
<td>14</td>
</tr>
<tr>
<td>Visual Computing and Interaction</td>
<td>14</td>
</tr>
<tr>
<td>Getting Started</td>
<td>15</td>
</tr>
<tr>
<td>Registration</td>
<td>15</td>
</tr>
<tr>
<td>Fees</td>
<td>15</td>
</tr>
<tr>
<td>Graduate Student TA Office</td>
<td>17</td>
</tr>
<tr>
<td>Copy Machines and Scanners</td>
<td>17</td>
</tr>
<tr>
<td>Employment and Financial Support</td>
<td>17</td>
</tr>
</tbody>
</table>

2
Teaching Assistants (TAs)................................................................. 17
Research Assistants (RAs) ............................................................ 17
Fellowships ............................................................................. 18
Graduate Division Travel Grants ............................................. 18
Need-based Financial Support .................................................. 18
Free Application for Federal Student Aid (FAFSA) .................. 19
International Students ............................................................... 20
English for Multilingual Student (EMS) Requirements .......... 20
Teaching Assistant Language Evaluation ................................ 20
Office of International Students and Scholars (OISS) .......... 20
Other Important Information ..................................................... 22
Establishing California Residency .......................................... 22
Transfer of Credit .................................................................... 22
   MS Students .................................................................. 22
   PhD Students ................................................................ 23
Incomplete Grades .................................................................. 23
Intercampus Exchange Program .............................................. 24
Time-to-Degree Standards ...................................................... 24
Academic Probation ................................................................. 25
Leave of Absence ................................................................. 25
   Types of Leave of Absence: ............................................. 25
Filing Fee Leave ................................................................. 26
In Absentia Registration ......................................................... 26
PhD Degree Requirements ...................................................... 28
Purpose Statement ................................................................. 28
Timeline for PhD, and Requirements for Remaining in Good Academic Standing: ........................................... 28
Graduate Class Level .............................................................. 29
   Doctoral Degree Levels .................................................... 29
Course Requirements ............................................................ 30
Finding a Research Advisor ................................................... 32
Forming a Committee ........................................................... 32
Conflict of Interest ............................................................... 33
Exam Requirements ............................................................... 33
Filing Your Dissertation .......................................................... 34
Annual Review ................................................................................................................. 34
Optional Emphasies .......................................................................................................... 35
  Computational Science and Engineering ........................................................................ 35
  Technology and Society .................................................................................................. 35
  Cognitive Science ........................................................................................................... 35
  Bioengineering ............................................................................................................... 36

Diplomas ............................................................................................................................. 36

Master of Science Degree Requirements ......................................................................... 36

MS Study Plan .................................................................................................................. 36

Requirements for the MS .................................................................................................. 37

Additional Requirements for Thesis .................................................................................. 37

Additional Requirements for Comprehensive Examination ............................................... 37

Additional Requirements for Project .................................................................................. 38

Earning an MS on the Way to the PhD ............................................................................ 38

MS Research Subject Areas ............................................................................................ 38
  Theory/Foundations ........................................................................................................ 39
  Systems ........................................................................................................................... 39
  Applications .................................................................................................................... 39

Becoming a PhD Student ................................................................................................... 40

Academic Conduct .............................................................................................................. 41

Where to go for Assistance ............................................................................................... 41
  Computer Science Department Administration - 2104 Harold Frank Hall .................... 41
  Office of International Students and Scholars (OISS) .................................................... 41
  Office of the Registrar .................................................................................................... 42
  Graduate Division ........................................................................................................... 42
  Graduate Students’ Association ....................................................................................... 42
  UCSB Multicultural Center .............................................................................................. 42
  Counseling Services ......................................................................................................... 43
  Mental Health Peer Program ........................................................................................... 43
  Women, Gender and Sexual Equity Department .............................................................. 43
  Orfalea Family Children’s Center ..................................................................................... 43
  Disabled Students Program (DSP) ................................................................................... 44
  Office of the Ombuds ....................................................................................................... 44
  UCSB Career Services ..................................................................................................... 44
  Arts and Lectures ............................................................................................................ 44
  UCSB’s Family Resource Website .................................................................................. 44
Important Contacts

Chair:
Tevfik Bultan  bultan@cs.ucsb.edu

Graduate Vice Chair:
Chandra Krintz  ckrintz@cs.ucsb.edu

Faculty Graduate Advisor:
Divyakant Agrawal  agrawal@cs.ucsb.edu

Student Services:
TBD, Student Affairs Manager
Graduate Matters  gradhelp@cs.ucsb.edu
Undergraduate Matters  ugradhelp@cs.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

<table>
<thead>
<tr>
<th>Faculty</th>
<th>Email (@cs.ucsb.edu)</th>
<th>Office</th>
</tr>
</thead>
<tbody>
<tr>
<td>Divyakant Agrawal</td>
<td>agrawal</td>
<td>HFH 3117</td>
</tr>
<tr>
<td></td>
<td>distributed systems and databases</td>
<td></td>
</tr>
<tr>
<td>Kevin C. Almeroth</td>
<td>almeroth</td>
<td>HFH 2113</td>
</tr>
<tr>
<td></td>
<td>computer networks and protocols, large-scale multimedia systems, performance evaluation, distributed systems</td>
<td></td>
</tr>
<tr>
<td>Prabhanjan Ananth</td>
<td>prabhanjan</td>
<td>HFH 1119</td>
</tr>
<tr>
<td></td>
<td>cryptography, and more broadly theoretical computer science</td>
<td></td>
</tr>
<tr>
<td>Elizabeth Belding</td>
<td>ebelding</td>
<td>HFH 5107</td>
</tr>
<tr>
<td></td>
<td>mobile networking, wireless networks and protocols, multimedia systems, performance evaluation, wireless solutions for developing regions</td>
<td></td>
</tr>
<tr>
<td>Michael Beyeler</td>
<td>mbeyeler</td>
<td>HFH 5102</td>
</tr>
<tr>
<td></td>
<td>bionic vision, computational neuroscience, computer vision and machine learning, human computer interaction, virtual and augmented reality</td>
<td></td>
</tr>
<tr>
<td>Tevfik Bultan</td>
<td>bultan</td>
<td>HFH 2159</td>
</tr>
<tr>
<td></td>
<td>model checking, concurrency, web services, static analysis, software engineering</td>
<td></td>
</tr>
<tr>
<td>Phillip Conrad</td>
<td>pconrad</td>
<td>HFH 1113</td>
</tr>
<tr>
<td></td>
<td>computer science education, computer networks and communication, multimedia computing, transport protocols, web technologies</td>
<td></td>
</tr>
<tr>
<td>Wim van Dam</td>
<td>vandam</td>
<td>HFH 2163</td>
</tr>
<tr>
<td></td>
<td>quantum computation, quantum algorithms, quantum communication, quantum information theory</td>
<td></td>
</tr>
<tr>
<td>Yufei Ding</td>
<td>yufeiding</td>
<td>HFH 1123</td>
</tr>
<tr>
<td></td>
<td>programming languages, software engineering</td>
<td></td>
</tr>
<tr>
<td>Ömer Eğecioğlu</td>
<td>omer</td>
<td>HFH 2115</td>
</tr>
<tr>
<td></td>
<td>bijective and enumerative combinatorics, parallel algorithms, approximation algorithms, combinatorial algorithms</td>
<td></td>
</tr>
<tr>
<td>Amr El Abbadi</td>
<td>amr</td>
<td>HFH 3115</td>
</tr>
</tbody>
</table>
information systems, databases, fault-tolerant distributed systems

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      arptigupta      HFH 1117
TBD

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   ckrantz         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 2117
computer and network security, malware detection, web security, program analysis, operating systems

Daniel Lokshtanov 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  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

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

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 graphics, mainly aimed at rendering photo-realistic visual appearance at real world complexity.

Xifeng Yan  xyan  HFH 1111
data mining, data management, machine learning, bioinformatics

Tao Yang  tyang  HFH 5113
parallel and distributed systems, high performance scientific computing, cluster-based network services, Internet search

Computer Science Lecturers

<table>
<thead>
<tr>
<th>Lecturer</th>
<th>Email (@cs.ucsb.edu)</th>
<th>Office</th>
</tr>
</thead>
<tbody>
<tr>
<td>Çetin Koç</td>
<td>koc</td>
<td>HFH 1119</td>
</tr>
<tr>
<td>Ziad Matni</td>
<td>zmatni</td>
<td>SSMS 4409</td>
</tr>
</tbody>
</table>

Computer Science Emeriti Faculty

Peter Cappello, PhD, Princeton University, cappello@cs.ucsb.edu
Teofilo F. Gonzalez, PhD, University of Minnesota, teo@cs.ucsb.edu
Oscar H. Ibarra, PhD, UC Berkeley, ibarra@cs.ucsb.edu
Richard A. Kemmerer, PhD, UC Los Angeles, kemm@cs.ucsb.edu
Terence R. Smith, PhD, Johns Hopkins University
Matthew Turk, PhD, MIT, mturk@cs.ucsb.edu

Computer Science Affiliated Faculty

Francesco Bullo, Mechanical Engineering, bullo@engineering.ucsb.edu
Shivkumar Chandrasekaran, Electrical and Computer Engineering, shiv@ece.ucsb.edu
Jennifer Jacobs, Media Arts and Technology, jmjacobs@ucsb.edu
B.S. Manjunath, Electrical and Computer Engineering, man@ece.ucsb.edu
Yasamin C. Mostofi, Electrical and Computer Engineering, ymostofi@ece.ucsb.edu
Pradeep Sen, Electrical and Computer Engineering, psen@ece.ucsb.edu
Yuan Xie, Electrical and Computer Engineering, yuanxie@ece.ucsb.edu
Zheng Zhang, Electrical and Computer Engineering, zhengzhang@ece.ucsb.edu
# Computer Science Staff

<table>
<thead>
<tr>
<th>Name</th>
<th>Email (@cs.ucsb.edu)</th>
<th>Phone</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Administrative Staff</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Departmental Affairs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Greta Halle</td>
<td>Business Officer</td>
<td>greta 7038</td>
</tr>
<tr>
<td>Samantha Oglesby</td>
<td>Assistant to Chair</td>
<td>svoglesby 2207</td>
</tr>
<tr>
<td><strong>Student Affairs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TBD</td>
<td>Student Affairs Manager</td>
<td>4323</td>
</tr>
<tr>
<td>Karen van Gool</td>
<td>Graduate Advising</td>
<td>gradhelp 4322</td>
</tr>
<tr>
<td>Katie Rosenthal</td>
<td>Undergraduate Advising</td>
<td>ugradhelp 4321</td>
</tr>
<tr>
<td><strong>Financial Affairs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sheryl Montoya</td>
<td>Financial Manager</td>
<td>smontoya 5283</td>
</tr>
<tr>
<td>Genevieve Singer</td>
<td>Financial Administrator</td>
<td>gsinger 5284</td>
</tr>
<tr>
<td>John Huber</td>
<td>Contracts and Grants</td>
<td>jhuber 3418</td>
</tr>
<tr>
<td>Maya Wang</td>
<td>Payroll Administrator</td>
<td>maya.wang 6438</td>
</tr>
<tr>
<td>Alex Molenaar</td>
<td>Contracts and Grants</td>
<td>alexandermolenaar 3418</td>
</tr>
<tr>
<td>Anne-Claire Cain</td>
<td>Contracts and Grants</td>
<td>anneclaire 3245</td>
</tr>
<tr>
<td><strong>Technical Staff</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Questions regarding technical support should always be sent to: help@engineering.ucsb.edu
Computer Science Research

Algorithms and Theory

Labs: Center for Geometric Computing
Faculty: Subhash Suri, Ömer Eğecioğlu, Wim van Dam, John Gilbert, 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
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: 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: 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, Linda Petzold, Tobias Höllerer, William Wang, Yufei Ding, Yu-Xiang Wang

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:** Kevin Almeroth, 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:** Divyakant Agrawal, Amr El Abbadi, Chandra Krintz, Ambuj K. Singh, Rich Wolski, Tao Yang, Arpit Gupta, Trinabh Gupta, Elizabeth Belding

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:** Tevfik Bultan, 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.
Labs: Computer Security Lab, Verification Lab, ArchLab, Systems and Networking Lab (SNL)
Faculty: Giovanni Vigna, Christopher Kruegel, Tevfik Bultan, Timothy Sherwood, Arpit Gupta, 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, Lingqi Yan, William Wang, Yuan-Fang Wang, Pradeep Sen
Getting Started

Registration
Continuous registration is required of all graduate students (please see pages 19-20 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 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 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 PhD students who are employed as Teaching Assistants (TAs). 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 annual fees can be found on the Registrar’s website: https://registrar.sa.ucsb.edu/fees-residency/fee-information/2019-2020-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 the staff GSA 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 one month prior to the beginning of the quarter. Employment priority is given to first- and second-year PhD students. All fees (fees, tuition and insurance) except for the campus fees are normally paid for PhD students who are employed as TAs. The campus fees are $328 for the 2019-20 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 PhD 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 PhD 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 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 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](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 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 [http://www.graddiv.ucsb.edu/financial/other-ucsb-fellowships](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](http://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](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 2\textsuperscript{nd} 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 PhD international students are expected to take the exams (ELPE) prior to the start of fall quarter of their arrival. The staff Graduate Student Advisor (GSA) 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 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 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 https://registrar.sa.ucsb.edu/fees-residency/residency/frequently-asked-questions

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, 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 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 Graduate Student Advisor 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. Once the GAC approves and signs the petition, the petition and required official transcripts will be submitted to Graduate Division for their review.

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 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 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/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 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 Graduate Student Advisor 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 excepted 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. Please also make sure you have an up-to-date PhD Study Plan on file, indicating how this course will be used to fulfill your course 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 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](http://www.graddiv.ucsb.edu/academic/forms-petitions/intercampus-exchange-eap#iepgs)

**Time-to-Degree Standards**
The normative time in the Computer Science department is two years for an MS degree, three years from beginning graduate study at UCSB to advance to doctoral candidacy (by successfully completing the MAE), and six years to complete a PhD. When a PhD 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 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. 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
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 academic 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: http://www.graddiv.ucsb.edu/academic/academic-performance

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:

- 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.
- MS 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. See: 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 In Absentia periods.
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:

- **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 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 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.

- **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 significant progress toward completing the PhD course and TA requirements. Year 2 students must review their PhD Study Plan with the Graduate Student Advisor in the Fall to make sure they are on track to complete all requirements before they complete their Major Area Exam (MAE).

- **Year 3**: Students are expected 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.

- **Year 4**: Students are expected to have completed their dissertation proposal. Students are expected to progress toward finishing their dissertation and graduating.

- **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.

**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. Graduate Division also uses class level to determine funding eligibility. For these reasons, it is critical that students are aware of both the departmental time-to-degree standards and the Registrar’s class level designations.

**Doctoral Degree Levels**

- **P1 status**: Academic or professional doctorate degree objective, but not advanced to candidacy

- **P2 status**: Academic or professional doctorate degree objective, objective, has advanced to candidacy (i.e. who have successfully completed their MAE and degree requirements). P2 status lasts for 9 registered quarters.

- **P3 status**: After 9 registered quarters as P2 status, 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 nonresident tuition (NRST). If you are hired as a GSR 35% or above, the funding source will be charged for your nonresident tuition, 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.

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 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 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 (page 22), 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 study plan must be on file as part of completing the PhD degree requirements and advancing to candidacy. The PhD 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 PhD:

- 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 PhD:

- 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 PhD:

- 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
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, 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 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 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, once officially reported to the Graduate Division, require completion of a Committee Form 1-A, Changes in Thesis or Dissertation Committee with the Graduate Division. These forms are prepared by the staff GSA, 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 Form I Committee 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.

http://www.graddiv.ucsb.edu/academic/conflict-of-interest

**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 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 completed and signed PhD Study Plan at the time of the MAE.

Several weeks before the exam, students should see the staff Graduate Student Advisor (GSA) to secure a room. One week before the exam, the title and abstract for the MAE should be sent to the staff GSA to circulate 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 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 the staff GSA to secure a room. One week before the exam, the title and abstract for the proposal should be sent to the staff GSA 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 the staff GSA to secure a room. One week before the exam, the title and abstract of your dissertation should be sent to the staff GSA 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. This guide, as well as everything you need to know about properly filing your dissertation, can be found on the Graduate Division website:

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 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 either put on progress plan or more formal 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 PhD studies.

Completing the annual PhD Progress review is not a substitute for completing the PhD Study Plan.

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 an MS or PhD 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 (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 relies on the undergraduate program to provide the necessary course work for graduate students with deficiencies 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 faculty Graduate Advisor. While the rules of the Graduate Division describe the conditions under which a student may withdraw from a course, the CS 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 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 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. Note: 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 toward 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. 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:

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

Earning an MS on the Way to the 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. The PhD proposal will be considered 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 at [http://www.graddiv.ucsb.edu/docs/default-source/academic-services-documents/changedegpetition-3-2018.pdf?sfvrsn=0](http://www.graddiv.ucsb.edu/docs/default-source/academic-services-documents/changedegpetition-3-2018.pdf?sfvrsn=0)

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

MS Research Subject Areas
Theory/Foundations

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

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

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

**Becoming a PhD Student**

Computer Science MS students who wish to become a Computer Science PhD student may apply for the PhD program via UCSB’s online graduate student application. Unlike with PhD students adding the MS degree objective, this may **not** be done by petition. You must instead go through the same process as you did when you first applied to our graduate program, following published deadline and application requirements. If your test scores have expired since you submitted them for your MS application you will need to retake them. Please note that you may request a waiver of the TOEFL score. See the Graduate Student Advisor (GSA) in HFH 2014 to make this request.

Please be sure to alert the GSA that you are submitting your application for the PhD program. You should first secure a CS dissertation 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.
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

Computer Science Department Administration - 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/

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
- Graduate Student Rights and Responsibilities

http://www.graddiv.ucsb.edu/
http://www.graddiv.ucsb.edu/rights-responsibilities

Graduate Students’ Association
- 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
- Massage chairs and egg chair

http://caps.sa.ucsb.edu/

Mental Health Peer Program
- Peer stress advisors
- Coping and stress reduction tools
- Relaxation rooms

https://www.ucsbmhp.com/

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/

Orfalea 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/

Office of the 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/