



# Department of Computer Science

## Graduate Student Handbook



Fall 2018

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## I. Introduction

This guide to graduate study in the Department of Computer Science contains information about degree programs; financial support; academic regulations and procedures; how to get started in graduate school; and other miscellaneous information of interest to graduate students. It is intended to supplement the *General Announcements* (<http://ga.rice.edu>) and the *Code of Conduct* (<http://sjp.rice.edu/current-code-of-student-conduct/>) by providing a more detailed description of the graduate program in Computer Science.

This handbook is the result of an ongoing attempt by the faculty to codify and make readily available to graduate students the rules, requirements, and general approach to graduate education of the Department of Computer Science. Please do not hesitate to notify the faculty about areas that need further clarification.

**Graduate students can seek advice from members of the Graduate Committee on course selection, as well as on any other academic issues and procedures. See**

<https://www.cs.rice.edu/academics/graduate-studies/current-students/>

In case of error, omission, or conflict, policies of the *General Announcements* supersede those stated within this handbook. If the policies of the program change during a student's tenure at Rice University, the student can elect to continue studies under the complete set of policies in place at the time of his or her matriculation or may choose to follow the updated policies in full. Students may not choose some regulations from one set of policies and some from another.

In rare cases, the faculty may apply a new regulation to all students who have not passed a specific milestone (e.g., candidacy) in their program if such a change will not materially affect the progress of the students. Students will be notified of such revisions.

It is the student's responsibility to be familiar with the rules, procedures, and requirements of the Computer Science Department, the Office of Graduate and Postdoctoral Studies, and Rice University. It is the ultimate responsibility of the student to know and follow all policies and timelines to allow for a timely graduation.

## II. Getting Started for Entering First Year Students

### Orientation Week

- Monday and Tuesday
  - **International Graduate Students** must attend the International Graduate Student Orientation held on Monday and Tuesday of Orientation Week.
  - Topics discussed will include: immigration regulations, legal issues, cultural adaptation, Rice honor code, health insurance, and applying for a Rice ID. Lunch and refreshments will also be served.
  - Students should bring originals and copies of all immigration documents. Be sure to make three copies of your passport ID page, I-94 card, I-20 card or DS-2019, and visa stamp.
- Wednesday
  - Graduate Orientation is mandatory for all incoming students. Any students with stipends beginning second half of August who are not present **will be docked one week's stipend**.
- Thursday
  - Department Orientation is usually held on Thursday of orientation week.
  - Registration for all new graduate students will take place on Thursday of orientation week, after you have been advised by your department on your planned course of study.

### Advising and Mentorship

Entering first year students are required to participate in the departmental orientation during the orientation week. During orientation, the Chair of the Graduate Committee will advise students on numerous issues including degree requirements, course selection, and, for M.S./Ph.D. students, research advisor selection. Each entering first year student is assigned a faculty mentor as well as a student mentor with whom the first year student can consult with on a variety of academic matters such as course selection. MCS students are generally mentored by the Chair of the Graduate Committee, whereas M.S./Ph.D. students are mentored by assigned faculty. M.S./Ph.D. students who have selected research advisors should also consult with their research advisors on academic matters such as course selection.

### Previous Graduate Work

Certain requirements may be modified for students who have done equivalent graduate work elsewhere. Students should consult with the Chair of the Graduate Committee to verify the guidelines described below to their particular case.

Graduate level courses taken elsewhere will be evaluated by an interview with an appropriate faculty member. Courses will be waived in areas where the student has sufficient background. The implication of a waived course is detailed in each degree

program's description.

For the Rice Ph.D. program, a research oriented Masters degree, including either a thesis or published paper, may substitute for the Rice M.S. The Graduate Chair, in consultation with the appropriate faculty, will decide if the previous work is equivalent to that expected for a Rice M.S. It is not necessary for the student to resubmit their M.S. thesis to the Graduate School, and the student will not receive a Rice M.S.

A Masters or similar degree based only on course work is not equivalent to the Rice M.S. Students holding such degrees must still demonstrate research ability by doing a 590 project and defending a Master thesis before they can qualify for Ph.D. candidacy.

### **Transcripts**

If you have completed coursework since you submitted your transcript with your application, please request that your previous institution send a new transcript to the Computer Science department coordinator. All new students must submit a *final original* transcript showing their Bachelor's degree conferred before they will be permitted to register for a second semester.

### **Registration**

Graduate students normally register during the first week of classes. Registration is performed using the Rice University student and faculty self-service system called ESTHER.

ESTHER can be accessed at <http://esther.rice.edu>. Access information for ESTHER will be provided from Graduate Studies by email to beginning graduate students prior to their arrival at Rice.

### **Drop/Add Policy**

Courses can be added after the first week. A course can be added for free until the end of the second week.

Classes can be dropped until the seventh week of the semester.

The schedule established in the first week can be adjusted, but the semester is only 15 weeks long. Therefore, students are encouraged not to take too long to make their final course selections.

### **English Classes**

The ability to write and speak English competently is essential for successful academic work at Rice and has become essential for scientific careers worldwide. The department reinforces its commitment to fostering speaking and writing skills in the following ways:

1. ESL (English as a Second Language) classes are available to non-native English speakers. Please see <http://esl.rice.edu> for more information.
2. All M.S./Ph.D. students must participate in the COMP 600 Graduate Research

Seminar.

The Rice Office of International Students and Scholars (OISS) offers a number of free English and culture classes. See <http://oiss.rice.edu> Additionally, Rice's ESL Program offers non-native speakers of English the opportunity to improve their language skills. Foreign students are strongly encouraged to take advantage of these opportunities.

### **Health and Safety**

Your completed health data form was due on July 1st. If you have not yet completed the form, please make arrangements to do so as soon as possible. If you have any questions, please contact Student Health at [health@rice.edu](mailto:health@rice.edu).

All students are required to pay a student health fee. We encourage you to take advantage of these resources. The Rice Student Health Services provides preventative and outpatient clinical care for the students of Rice University. The Wellness Center is an excellent resource for information and tools on a variety of student wellness issues. The Rice Counseling Center offers professional counseling to promote positive mental health for all Rice University students. For more information about the services offered, please visit <http://health.rice.edu>.

### **Preventing Sexual Harassment**

As a graduate student you may find yourself in a position of power over students in courses that you lead or in a position of vulnerability as the junior member of the academic community. It is important for you to know both your rights and responsibilities. All incoming graduate students must take the online "Preventing Sexual Harassment" training. Please go to the New Graduate Student Training Page of the Graduate Student & Postdoctoral Studies Webpage to take the training. <http://graduate.rice.edu/training>.

### **Responsible Conduct of Research**

M.S./Ph.D. students are also required to take the online Responsible Conduct of Research training. As a new member of the academic community, you will be responsible for conducting your research with integrity. This training serves as an introduction to what will be expected of you as a member of the research community. Please go to the New Graduate Student Training Page of the Graduate Student & Postdoctoral Studies Webpage to take the training. <http://graduate.rice.edu/training>.

### **Computers**

Upon arrival at Rice, every graduate student is provided with an account on the departmental computing system. All new students are assigned a Rice NetID and password, which gives them access to Rice email and other resources.

See the Rice IT website for more information about computing resources: <http://it.rice.edu>.

Many research groups maintain their own specialized computing facilities. These become available to the student when he/she joins the research group. Every first year Ph.D. student will be provided with a fully networked desktop

workstation. For continuing Ph.D. students and M.S. students awarded the CS Graduate Fellowship, computer equipment will be provided by the students' thesis advisors. In addition, graduate students have access to the various research computing facilities at Rice University.

### **Rice Library**

The Rice Fondren Library is on the main quad facing Lovett Hall. Students have access to the Fondren Library with a valid Rice ID. Many library resources, including catalogues, online journals, recalls, renews, and interlibrary loans, are available online at <http://library.rice.edu>

### **Communications within CS**

The Computer Science department provides a detailed website, email groups, and social media to advertise events of interest, promote the activities of faculty and students, and foster community within the department.

- Web: <http://www.cs.rice.edu> The website includes events, stories about CS students and faculty, a faculty and staff listing, links to student organizations, and more.
- Facebook Official Page: <http://www.facebook.com/RiceCS>
- Rice CS group: <http://www.facebook.com/groups/365985373415471/>
- CS GSA Group: <http://www.facebook.com/groups/rcsgsa/>
- LinkedIn: <http://www.linkedin.com/grp/home?gid=4311484>
- Email: If your Rice email doesn't regularly get emails from the department, please let us know. You should be on one or more departmental mailing lists.
- You: CS wants to include you! Won an award? Published a paper? Had a great experience? Participated in something new? Tell us about it by emailing [comp@rice.edu](mailto:comp@rice.edu) and you might be featured in an upcoming story.

The CS department encourages all graduate students to maintain a website or LinkedIn page with a photo and current information. Ph.D. students should have a professional web page that includes papers and research interests. MCS students may prefer to have a LinkedIn page for professional recruiting purposes.

Rice offers several ways to create a personal website. Brief descriptions of what is available can be found at <https://kb.rice.edu/page.php?id=70749>. Blog sites via [blogs.rice.edu](http://blogs.rice.edu) are particularly easy to configure and come with drag-and-drop WYSIWYG function. Examples of a few CS websites that use these resources are:

- [web.rice.edu](http://web.rice.edu): <http://jmd11.web.rice.edu/> & <http://rjs7.web.rice.edu/>
- [blogs.rice.edu](http://blogs.rice.edu): <http://yitingxia.rice.edu/> & <http://monroy.blogs.rice.edu/home/>

Many CS websites rely on a `public_html/index.html` file in their home directory. You can log in to [orion.cs.rice.edu](http://orion.cs.rice.edu) to access the `public_html` directory in your home directory and create an `index.html` file. Examples of student home pages that use this option include:

- <http://www.cs.rice.edu/~sjd3>
- <http://www.cs.rice.edu/~xinh>

Using a departmental computer, login with your netid and CS login credentials. Login to any of carme.cs.rice.edu, orion.cs.rice.edu, or elara.cs.rice.edu using ssh from a Linux or Mac computer, or if you're using Windows, putty.exe. Your NFS home directory will be mounted and you will find a public\_html directory you can put your files into. Contact [help@rice.edu](mailto:help@rice.edu) if you do not have a public\_html directory. To transfer files, on Linux and Mac you can use scp or on Windows, users have reported good results using WinSCP. Save the files into the public\_html directory and you will be able to access them with a browser.

### Useful Websites

- Rice University: <http://www.rice.edu/>
- Computer Science Department: <http://www.cs.rice.edu/>
- Graduate and Postdoctoral Studies: <http://graduate.rice.edu/>
- Office of International Students and Scholars (OISS): <http://oiss.rice.edu/>
- Fondren Library: <http://library.rice.edu/>
- Esther: [esther.rice.edu](http://esther.rice.edu)
- Graduate Student Association: <http://gsa.rice.edu>
- Computer Science Graduate Student Association: <http://csgsa.rice.edu>

### **III. Financial Support**

#### **Stipends and Tuition Waivers**

Rice University is somewhat unusual because relatively few graduate students support themselves by teaching. Almost all M.S./Ph.D. students in Computer Science receive stipends and tuition waivers from the university, an external research grant awarded to a CS faculty member, or a Graduate Fellowship awarded to the student.

The Office of Graduate Studies supports most incoming Ph.D. students during their first year of studies and a few individuals in later years. The CS department supports M.S. students who have received the CS Graduate Fellowship. This support includes a stipend and tuition. At the beginning of each year, additional payments for fees, health insurance, and parking are required.

As a matter of University policy, Rice does not offer financial support for MCS students.

If a student needs financial aid beyond what the department has arranged, the student may contact the Financial Aid office for information about loan programs for graduate students.

#### **External Prizes and Fellowships**

The National Science Foundation, as well as other government agencies and foundations, offer scholarships, fellowships, and other funding opportunities for M.S./Ph.D. students. M.S./Ph.D. students are strongly encouraged to seek out these opportunities. The application process is a valuable learning experience. Being awarded one of these prestigious fellowships is a great enhancement to a student's vitae, many of these fellowships carry a higher stipend level than that offered by the CS department, and the CS department offers a substantial stipend supplement. The Faculty advisors will provide guidance and help in selection of appropriate opportunities and in the application process.

#### **Paid Teaching Assistantships**

A limited number of paid teaching assistantships are available to those who wish to acquire teaching experience. Since some evidence of teaching competence is a prerequisite for entry-level academic positions, CS graduate students who wish to eventually become professors should especially take advantage of this opportunity to enhance their vitas in this important way.

#### **Termination of Financial Support**

Active participation in required academic activities is a basic condition for continued financial support. Students who are absent from such required activities without permission and without mitigating circumstances may be subject to termination of financial support. See the General Announcements' section on Academic and Judicial Discipline for details: [http://ga.rice.edu/GR\\_dismissal/](http://ga.rice.edu/GR_dismissal/)

## **IV. Academic Regulations and Procedures**

### **Honor Code**

Graduate students are expected to observe the provisions of the Rice University Honor Code as presented in the booklets received at orientation. Students are responsible for knowing and understanding the principles of the Honor Code. In particular, plagiarism is never acceptable.

All written examinations and certain specifically designated assignments are conducted under the Honor Code. The faculty will state the conditions applying to various forms of class work. If in doubt about the conditions for a particular assignment, it is your responsibility to ask the faculty member in charge of the course. In most cases, a single violation of the Honor Code, such as plagiarism or cheating on an exam or assignment, results in failure of the course or expulsion from Rice.

The student body at Rice, through its commitment to the Honor Code, accepts responsibility for assuring the validity of all examinations and assignments conducted under the system. The Honor Council is responsible for investigation of all reported violations and for trial in those cases where the facts warrant. See the Honor Council's website for details: <http://honor.rice.edu/>

### **Petitions, Appeals, Grievances, and Problem Resolution**

All requests for exceptions or variances from the policies outlined in this document or complaints regarding inappropriate conduct by other students, faculty members, or staff should be addressed in writing to the Graduate Committee and delivered to the Chair of this committee or the Chair of the Department. Petition or appeal letters should state precisely what exception or variance is requested and give detailed reasons to support the request. Either the Graduate Committee, the Chair of the Department, or the full faculty will decide the issue, as appropriate. See the General Announcements' section on Dispute Resolution for details: [http://ga.rice.edu/GR\\_disputes/](http://ga.rice.edu/GR_disputes/)

### **Sexual Misconduct (Title IX Policy)**

Rice University is committed to providing an environment that is free from gender-based discrimination. Title IX of the Higher Education Amendments of 1972 prohibits discrimination on the basis of sex in education programs and activities. Consistent with Title IX, the University does not tolerate sex discrimination, including sexual misconduct and relationship violence.

Rice encourages any student who has experienced an incident of sexual, relationship, or other interpersonal violence, harassment, or gender discrimination to seek support. There are many options available both on and off campus for all graduate students, regardless of whether the perpetrator was a fellow student, a staff or faculty member, or someone not affiliated with the university.

Students should be aware when seeking support on campus that most employees are required by Title IX to disclose all incidents of non-consensual interpersonal behaviors to Title IX professionals on campus who can act to support that student and meet their

needs. The therapists at the Rice Counseling Center and the doctors at Student Health Services are confidential, meaning that Rice will not be informed about the incident if a student discloses to one of these Rice staff members. Rice prioritizes student privacy and safety, and only shares disclosed information on a need-to-know basis. If you are in need of assistance or simply would like to talk to someone, please call Rice Wellbeing and Counseling Center, which includes Title IX Support: 3311/(713) 348-3311.

Policies, including Sexual Misconduct Policy and Student Code of Conduct, and more information regarding Title IX can be found at <http://safe.rice.edu>

### **Academic Probation and Dismissal**

Students who fail to meet the requirements stated in this document and those in the General Announcements can be placed on academic probation or be dismissed from the program. See the General Announcements' section on Academic and Judicial Discipline for details: [http://ga.rice.edu/GR\\_dismissal](http://ga.rice.edu/GR_dismissal)

## **V. The Professional Master's Programs (MCSE and MCS)**

### **MCSE**

The Master in Computational Science and Engineering (MCSE) Degree Program is a non-thesis degree program offered jointly by the departments of Computational and Applied Mathematics, Computer Science and Statistics in the School of Engineering. The program is designed to provide training and expertise in modern and computational techniques with real-world applications in a wide range of industries. Because MCSE is a joint program, details of the degree requirements are published here:

<http://ga.rice.edu/programs.aspx?FID=2147483806>

### **MCS**

The Master of Computer Science (MCS) Degree Program is a non-thesis degree program intended for students who will pursue a technical career in the computer industry. The MCS program normally requires three semesters of full-time study. MCS students must spend at least one fall or spring semester in full-time or part-time graduate study at Rice. Full-time study is defined as enrollment in nine or more hours of course work.

Students must complete 30 semester hours of course work approved by the department with a cumulative grade point average of at least 2.67. Courses taken on a pass/fail basis do not count toward the required 30 semester hours of course work. The student works with the department's MCS advisor to develop an approved course plan.

Students may transfer up to six hours of credit from another university with approval of the student's MCS advisor, the Computer Science Graduate Committee Chair, and the instructor of the equivalent Rice course. Transferred courses must be compatible in content and depth to the corresponding course at Rice, and must not have counted toward another degree.

The MCS program does not normally lead to further graduate study. No financial aid is available from the university or the department for MCS students.

### **Prerequisites**

In general, we expect that a student must have had the following minimal background in computer science. A student must have previously taken courses or otherwise demonstrated background in the following: intermediate-level programming and algorithms; discrete math; and computer systems or organization. Also, many individual courses have prerequisites, including not only lower-level computer science courses, but also digital logic design, linear algebra, probability, and statistics. A student may need to take prerequisite courses that do not count toward the MCS degree.

## Curriculum for students admitted Fall 2015 or after

- **General Requirements:** 30 credit hours are required, of which at least 24 must be completed at Rice. Students cannot use one course to satisfy requirements from multiple categories (e.g., both Breadth and Depth). No more than 3 credit hours total may be counted from 1- and 2-credit-hour courses. All credit hours must be at the 500-level or above.
- **Breadth** (9–12 credit hours): Students must take one course from three of the four following groups. Students demonstrating that they have previously passed one or more courses of comparable depth from a group may petition to be exempted from that group's breadth requirement.
  - Languages & Compilers: COMP 506, 511, 512, 515, 535
  - Theory: COMP 507, 509, 581, 582
  - Systems: COMP 508, 513, 521, 522, 524, 526, 528, 529, 532, 534, 538, 541, 554, 556, ELEC 553
  - Applications: COMP 502, 530, 531, 533, 540, 542, 546, 550, 557, 560, 571, 576, 602, ELEC 549
- **Depth** (6–8 credit hours): Students must complete a tightly coupled two-course focus. A list of approved specializations is available (see below), but students may design their own with approval by the MCS advisor. They may include courses outside the Computer Science Department, and they may include one independent study project. *The following list of depth specializations is representative, but not comprehensive.*
  - Parallel computing: two of COMP 515, 522, 534
  - PL theory and logic: two of COMP 511, 507, 509
  - Compilers: two of COMP 506, 512, 515
  - Networking: two of COMP 524, 529, 556
  - Systems and security: two of COMP 508, 521, 528, 532, 538, 541, ELEC 553
  - AI and robotics: two of COMP 502, 540, 542, 550, 557, 576, 602
  - Optimization: two of CAAM 560, 564, 565
  - Architecture: two of COMP 526, 535, 554
  - Software engineering: two of COMP 501, 504, 505, 539
  - Database: COMP 530, 533
  - Computer vision: two of COMP 560, 546, ELEC 549
  - Data science: two of COMP 502, 530, 533, 540, 542, 576, 602
- **Design project** (4 credit hours): Students must complete a design project: one of COMP 501, 504, 539, or a 590 independent study project of similar depth.
- **Professional Development:** Up to 6 credit hours is encouraged but not required:
  - COMP 694 How to be a Chief Technology Officer
  - ENGI 510 Technical and Managerial Communications

- ENGI 529 Ethics and Engineering Leadership
  - ENGI 505 Engineering Project Development and Management
  - ENGI 515 Leading Teams and Innovation
  - ENGI 528 Engineering Economics
  - ENGI 542 Communication for Engineers
  - ENGI 545 Strategic Thinking
  - ENGI 610 Management for Science and Engineering
  - ENGI 614 Learning How to Innovate
  - ENGI 615 Leadership Coaching for Engineers
- **Electives:** Any remaining credit hours counting towards the degree must be 500-level or above COMP courses except COMP 590 independent study projects. ENGI 530 Engineering Practicum does not count towards the degree.

**Curriculum for students admitted Spring 2015 or before is available from the Chair of the Graduate Committee**

## **VI. The M.S. Program**

The Master of Science in Computer Science (M.S.) Degree Program is a terminal degree program. The M.S. in Computer Science is a research degree requiring a thesis in addition to course work. A total of 30 credit hours at the 500-level and above (including thesis hours) is required. M.S. students must have their course selections approved by the Graduate Committee Chair each semester. Students enrolled in the Ph.D. Program must meet additional requirements before they receive the M.S. degree. See the Ph.D. Program section for further information.

## VII. The Ph.D. Program

The Doctor of Philosophy with dissertation in Computer Science (Ph.D.) program requires an extended course of study and research that typically lasts from four to six years. The Ph.D. is granted for demonstrated ability to conduct original research. The Ph.D. degree is intended for students planning to pursue a career in computer science research and education.

### The typical Ph.D. Timeline

#### First Week

- Attend university and department orientation.
- Register for classes.

#### First Semester

- Take 2 courses. Enroll in COMP 600 (note that this is required for every semester). If needed, register for COMP 800 research credits with your assigned faculty mentor (who is not necessarily your research advisor).
- Become familiar with faculty and fellow graduate students.
- Attend faculty research talks and department colloquia to learn about research inside and outside the department.
- Think about which area to pursue for your Ph.D. research and who to choose as your Ph.D. advisor. Meet with potential Ph.D. advisors and ask faculty for research papers to read independently outside of class.
- Choose a COMP 590 advisor for the next semester.

#### Second Semester

- Take 1 or 2 courses.
- Complete a COMP 590 project with a faculty advisor.

#### Second Year

- Continue to take courses and complete 5 of the 8 required courses.
- Finish your M.S. thesis.
- Receive the M.S. degree after completing 5 of the 8 required courses, the COMP 590 requirement, and the M.S. thesis requirement.

#### Third Year

- Continue to take courses and complete all 8 required courses. Take your C-Exam.
- Apply for Ph.D. candidacy.

#### Fourth Year and Beyond

- Concentrate on your Ph.D. research.
- Do your thesis proposal at least one year before your thesis defense.
- Defend your Ph.D. thesis.

Summers are an extremely valuable time as students can perform research without the distraction of coursework and grading. Summers are also a time when some students secure internships in order to gain valuable experience working for industry or in

research labs. If a student plans to absent themselves from Rice during the summer, either to take on an internship or for another activity, please inform the Department Coordinator as early as possible so that good use can be made of the stipend funds that are not needed for your support.

### **Choosing an Advisor**

Your advisor is going to be the most important person in your life during your stay in graduate school. He/she is your teacher and mentor, your guide to scholarship and research. Your advisor will typically fund you from one of his/her research grants or help you to apply for outside scholarships and fellowships. Even beyond graduate school, your advisor will have an important influence on your life because employers will ask him/her to write letters of recommendation on your behalf and his/her opinion of you will count more than anyone else's at least for the first several years after you graduate.

Choose your advisor carefully. Decide the general area of research—AI, Bioinformatics, Compilers, Databases, Data Mining, Graphics, Networking, Operating Systems, Programming Languages, Robotics—you would like to pursue. Then talk to other graduate students working in this area. Some students want a good deal of guidance, while others want largely to be left alone to pursue their own ideas. Find out how each advisor works with his/her students. You need to find a good fit, both for your research interests and for your style. How often does the advisor meet with his/her students? How much guidance does he/she provide? Does he/she specialize in theory or applications? How does this emphasis coincide with your interests? Does the advisor have sufficient funding to support another student for several years? After completing their dissertations, do these advisor's students get good jobs in industry or academia? Getting answers to these questions early on will make your choice easier and your stay in graduate school a much more pleasant experience. Learn as much as you can about our professors as early as you can. The more information you have, the better your choice is likely to be.

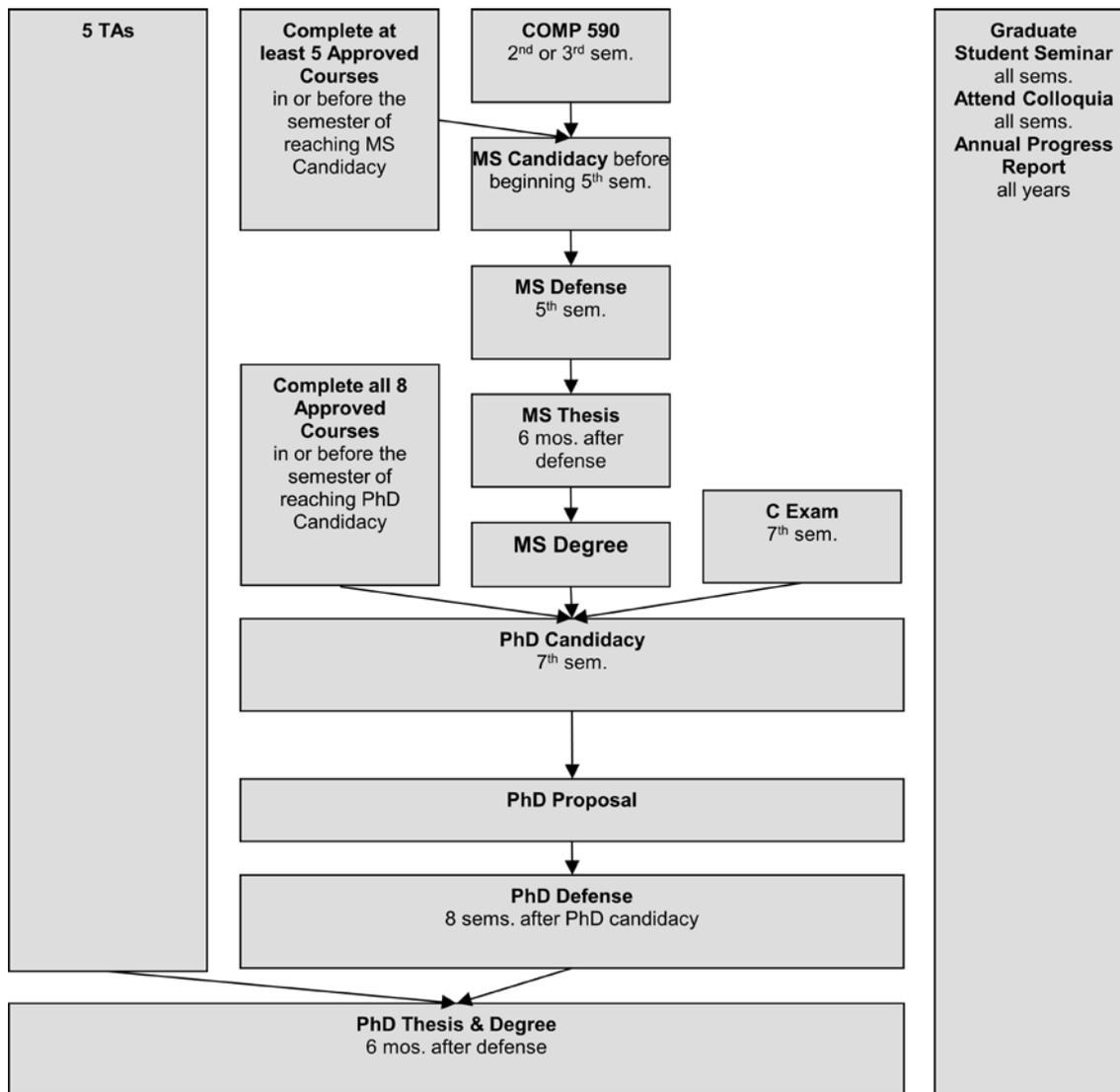
### **Changing Advisor**

Most students continue to work with their COMP 590 research advisor after the second semester and successfully complete their Ph.D. under his/her supervision. Students are allowed to change their research advisor but must do so judiciously since changing advisor may lead to a delay to graduation. A student who is considering an advisor change should consult with the Chair of the Graduate Committee or the Chair of the Department, who will advise and guide the student.

## Detailed Requirements

This section lists the department's PhD program requirements. The university's requirements are more fully described in the [General Announcements](#) and by the [Office of Graduate and Postdoctoral Studies \(OGPS\)](#).

The following figure summarizes these requirements, their deadlines, and the relationships between them. Arrows in the figure represent dependencies, with the rough timing and time relationships between requirements flowing from top to bottom.



## Serving as Teaching Assistant

You must TA for 5 semesters, each of which will average about 10 hours per week. TA-ing for pay does not count towards this requirement. You may TA the same course multiple times. Duties vary by course and instructor but typically include grading, holding regular office hours to help students, leading lab or tutorial sessions, and course administration.

At Rice, it is uncommon for graduate students to teach courses. If you wish to gain additional teaching experience, consider the following common options:

- TA a course with a student-led lab section.
- TA a course, and ask the instructor whether you can lead classes or review sessions.
- Contact the Department Chair to be considered for a School of Engineering Teaching Assistantship. Among its requirements are for you to lead 2 classes.
- Consult with your research advisor whether you can help lead research seminars.

## Course Requirements– Deadlines: 5<sup>th</sup> and 7<sup>th</sup> semesters

**Breadth Component:** You must pass at least one course from each of six of the sub-areas from the list of approved breadth courses (see “Ph.D. Breadth Courses”), with at least two courses are from each of the three super-areas. **Electives Component:** You must pass at least two additional courses from the approved electives list (see “Ph.D. Electives Courses”). You must maintain a cumulative grade point average of at least **B+ (3.33)** in these courses.

Students in the PhD program are required to satisfactorily (defined as course CGPA  $\geq$  B+) complete at least 5 of the 8 required courses to receive the MS degree.

Consequently, students in the PhD program are required to complete at least 5 of the 8 required courses no later than the semester that they petition for MS Candidacy (the deadline for which is before the beginning of the 5<sup>th</sup> semester). In other words, by the end of that semester, the student will have completed all non-thesis related MS degree requirements. Students in the PhD program are required to satisfactorily (defined as course CGPA  $\geq$  B+) complete all 8 required courses to receive the PhD degree.

Consequently, students in the PhD program are required to complete all 8 required courses no later than the semester that they petition for PhD Candidacy (the deadline for which is the 7<sup>th</sup> semester). In other words, by the end of that semester, the student will have completed all non-thesis related PhD degree requirements.

All Ph.D. students receiving financial support must register for at least 9 hours each semester and cannot drop below 9 hours. Use the course COMP 800 "Graduate Research" to fill any needed hours in your schedule.

If you need to add a course during the 3<sup>rd</sup> or 4<sup>th</sup> week of classes, you must get the signature of the instructor and your advisor. After the 4<sup>th</sup> week, a signature from the OGPS is also required. If you wish to drop a course after the 10<sup>th</sup> week of classes, you need signatures from your advisor and OGPS.

### **Graduate Student Seminar– All semesters in residence**

Every semester you are in residence, you must register for and pass COMP 600, the Graduate Student Seminar, a one credit hour course. Grades are based upon attendance. For every four semesters in residence, you must present at least one talk.

### **COMP590 Project– Deadline: 3<sup>rd</sup> semester**

You must complete a COMP590 research project.

1. Find a project advisor to work with – typically your research advisor. Notify the Department Coordinator who this is.
2. Enroll in COMP 590 each semester you work on the project. Receiving a grade does not signal project completion.
3. At the end of this project, you must write a report approved by the project advisor.
4. Your advisor will notify the Department Coordinator that the project has been completed.
5. You are strongly encouraged to present a poster at a suitable venue.

### **M.S. Degree Candidacy– Deadline: before beginning of 5<sup>th</sup> semester**

You must petition for M.S. candidacy. This petition must be approved by OGPS before the Master's thesis defense can be held. At the time of this petition, you either must have fulfilled the COMP 590 and the 5-course requirements, or you expect to fulfill them by the end of the semester you are approved for M.S. candidacy.

1. Form a Master's thesis committee of at least 3 members. Your committee chair (a.k.a. thesis director) will be your research advisor, who must be a tenure-track Computer Science faculty member at Rice. A second committee member must also be a tenure-track Rice CS faculty member. A third committee member must be a tenure-track Rice faculty member, although may be from outside CS. Any additional committee members may be faculty members or research personnel at any institution.
2. Fill out the "[Petition for Approval of Candidacy for the Master's Degree](#)", available from OGPS or from the Department Coordinator.
3. Give this form and an unofficial transcript to the Department Coordinator.
4. OGPS will send you a packet, including a copy of your approval of candidacy.

If you already have a Master's degree from another University, you may petition the Graduate Committee to waive this requirement, along with the associated thesis defense and thesis.

1. Fill out the "[Request for Waiver of Rice M.S. Thesis](#)", available from the department web site.
2. Give this form and a copy of your Master's thesis to the Department Coordinator.

### **M.S. Thesis Defense – Deadline: 5<sup>th</sup> semester**

You must defend your Master's thesis research in a public oral presentation. This presentation is normally about 45 minutes, plus questions and discussion. Your committee will evaluate your thesis and give one of the following three recommendations: (1) pass M.S. continue Ph.D. studies, (2) pass M.S. stop PhD studies, (3) fail M.S. A recommendation of (2) or (3) by the committee is considered a failure to meet program requirement.

1. At least 3 weeks prior to your thesis defense presentation, email the Department Coordinator with the following: date, time, title, abstract, and committee members.
2. The Department Coordinator will reserve a room, announce the talk (at least 1 week in advance) — including the required announcements to the department bulletin board and OGPS — and make the thesis draft available for all faculty members to review.
3. Make sure your advisor approves your thesis draft. You will provide the Department Coordinator and all committee members with the approved thesis draft at least 1 week before the defense; you should remind your committee members of the time and location of your defense.
4. Get the approval form from the Department Coordinator that will be sent by OGPS. At the defense, have your thesis committee sign this form. Make two copies of the signed form. Give one copy and the original to the Department Coordinator. Give one copy to OGPS.
5. Get the M.S. defense evaluation form from the Department Coordinator. At the defense, have your thesis committee complete and sign this form and return it to the Department Coordinator.

### **M.S. Thesis – Deadline: 6 months after M.S. Thesis Defense**

The following are only the highlights of the [procedures](#) described by OGPS.

1. Get your original signed Master's thesis defense form from the Department Coordinator.
2. Submit this form and a copy of the thesis to OGPS.

### **M.S. Degree – After completing 5 approved courses, COMP590 Project, and M.S. Thesis**

After finishing these requirements, you may receive the M.S. degree.

1. Fill out an “Application for Degree” on [Esther](#) before the end of the semester.
2. Optionally, participate in that semester’s graduation ceremony.

### **C Exam – Deadline: 7<sup>th</sup> semester**

You must pass a private oral examination in your area of research. Each area has a formal or informal syllabus listing topics and material covered. The exam normally takes 1.5 to 2 hours. It covers both basic material, such as that from a 400-level course, and more advanced material, such as solving a problem in current research. Your examination committee will evaluate your performance and give one of the following three recommendations: (1) proceed to PhD proposal, (2) retake exam, (3) leave Ph.D. program. A recommendation of (3) by the committee is considered a failure to meet program requirement.

1. Form an examination committee of 3 faculty members. Consult your research advisor about how this is done in your research area.
2. Consult your research advisor or examination committee for your exam syllabus.
3. Consider scheduling your exam in the same semester as other students in the same research area, so you can study together.
4. Get the “[C Exam Record](#)” form, available from the Department Coordinator.
5. At the exam, have your examination committee fill out and sign this form.
6. Submit this form to the Department Coordinator.

### **Ph.D. Degree Candidacy – Deadline: 7<sup>th</sup> semester**

You must petition the OGPS for Ph.D. candidacy. At the time of this petition, you must have completed the M.S. thesis, the C exam, and either have fulfilled the 8-course requirement, or you expect to fulfill it by the end of the semester you are approved for Ph.D. candidacy.

1. Form a Doctoral thesis committee of at least 3 members. Your committee chair (a.k.a. thesis director) will be your research advisor, who must be tenure-track Computer Science faculty member at Rice. A second committee member must also be a tenure-track Rice CS faculty member. A third committee member must be a tenure-track Rice faculty member from outside CS. Any additional committee members may be faculty or research personnel at any institution.
2. Fill out the “[Petition for Approval of Candidacy for the Doctoral Degree](#)”, available from OGPS or from the Department Coordinator.
3. Give this form and an unofficial transcript to the Department Coordinator.
4. OGPS will send you a copy of your approval of candidacy.

### **Ph.D. Thesis Proposal – Deadline: Determined by advisor**

You must propose your Ph.D. thesis research in a written thesis proposal and a public

oral presentation of your proposal. Your committee will evaluate your thesis proposal and give one of the following three recommendations: (1) pass exam and continue Ph.D. studies, (2) repeat proposal exam, (3) leave Ph.D. program. A recommendation of (3) by the committee is considered a failure to meet program requirement.

1. At least 3 weeks prior to the date of your proposal presentation, email the Department Coordinator with the following: date, time, title, abstract, and committee members.
2. The Department Coordinator will reserve a room and announce the talk (at least 1 week in advance).
3. Make sure your advisor approves your written thesis proposal. You will provide all committee members with the approved written thesis proposal at least 1 week before the proposal presentation; you should remind your committee members of the time and location of your proposal.
4. Get the Ph.D. thesis proposal evaluation form from the Department Coordinator. At the proposal, have your committee complete and sign this form and return it to the Department Coordinator.

#### **Ph.D. Thesis Defense – Deadline: 8 semesters after Ph.D. Degree Candidacy**

You must defend your Ph.D. thesis research in a public oral presentation. This presentation is normally about 45 minutes, plus time for questions and discussion. Your committee will evaluate your thesis and give one of the following two recommendations: (1) award Ph.D., (2) deny Ph.D. A recommendation of (2) by the committee is considered a failure to meet program requirement.

1. At least 3 weeks prior to the date of your thesis defense presentation, email the Department Coordinator with the following: date, time, title, abstract, and committee members.
2. The Department Coordinator will reserve a room, announce the talk (at least 2 weeks in advance) to the department and to OGPS, and make the thesis draft available for all faculty members to review.
3. Make sure your advisor approves your thesis draft. You will provide the Department Coordinator and all committee members with the approved thesis draft at least 2 weeks before the defense; you should remind your committee members of the time and location of your defense.
4. Get the approval form from the Department Coordinator that will be sent by OGPS. At the defense, have your thesis committee sign this form. Within one week after a successful defense, make 2 copies of the signed form, giving one each to the Department Coordinator and OGPS.
5. Get the Ph.D. defense evaluation form from the Department Coordinator. At the defense, have your thesis committee complete and sign this form and return it to the Department Coordinator.

#### **Ph.D. Thesis & Degree – Deadline: 6 months after Ph.D. Thesis Defense**

You must submit your written thesis to OGPS.

The following are only the highlights of the [procedures](#) described by OGPS:

1. Get the original signed Doctoral thesis defense form from the Department Coordinator.
2. Have two copies of your thesis signed by all of your committee members. No substitute signatures are allowed, even if a committee member is out of town.
3. Submit this form and the thesis copies to OGPS.
4. Fill out an "Application for Degree" on [Esther](#) before the end of the semester.
5. Optionally, participate in that semester's graduation ceremony.

## Extensions

We expect you to treat the deadlines outlined in this document seriously. However, if you need an extension on the deadline for any requirement, you may petition the Graduate Committee for an extension.

1. Include in your petition your current status on completing that requirement, the reason for the extension request, and your plan and schedule for completing that the requirement.
2. Have your advisor sign the petition.
3. Give the petition to the Department Coordinator.
4. The Graduate Committee Chair will inform you whether your petition was granted.

## Ph.D. Breadth Courses

The table below lists the approved courses that may be used to satisfy the breadth component of the Ph.D. course requirements. The approved courses are grouped into three super-areas, each having three sub-areas. You must pass at least one course from each of six of the sub-areas on this list, with at least two of these courses from each of the three super-areas. In other words, you must take at least one course from at least two of the sub-areas out of each of the three super-areas. This is a total of six courses required to complete the breadth requirement.

A Ph.D. student may petition to the Graduate Committee to have a breadth component course waived if another course of equivalent scope and depth has been successfully completed by the student elsewhere. The equivalence of such a course will be evaluated by an interview with an appropriate faculty member. However, the student must still complete 8 courses total at Rice to satisfy the course requirements. In other words, instead of the waived breadth component course, the student must take an additional elective course.

	<b>Sub-Area</b>	<b>Course #</b>	<b>Course Name</b>
<b>Super-Area 1</b>	AI and robotics	557	Artificial Intelligence
		550	Algorithmic Robotics
	Bioinformatics	460	Advanced Computer Game Creation
	and graphics	560	Computer Graphics
		571	Bioinformatics: Sequence Analysis
	Security	541	Introduction to Computer Security
<b>Super-Area 2</b>	Algorithms	582	Design and Analysis of Algorithms
	Languages	501	Production Programming
		511	Principles of Programming Languages
	Logic and automata	509	Logic in Computer Science
		581	Automata, Formal Languages, and Computability
<b>Super-Area 3</b>	Architecture	554	Computer Systems Architecture
		526	High-performance Computer Architecture
	Compilers and	412 or	Compiler Construction
		506	
	parallel computing	534	Parallel Computing
		512	Advanced Compiler Construction
	Systems	521	Operating Systems and Concurrent Programming
	556	Introduction to Computer Networks	

## Ph.D. Electives Courses

In addition to the six courses required to complete the breadth component of the course requirements for the Ph.D. degree, you must also complete the electives component of the Ph.D. course requirements, consisting of at least two additional courses. These two courses may be chosen from either the list of approved breadth courses (see “Ph.D. Breadth Courses”) or from this list of additional courses that may also be used to satisfy the electives component. For courses not listed, consult with the Graduate Committee Chair. Students are also encouraged to take courses beyond this minimum total of eight required courses, whether or not on these two lists.

### AI and Robotics

COMP 540 Statistical Machine Learning

COMP 542 Large-Scale Machine Learning

### Bioinformatics

COMP 470 From Sequence to Structure: An Introduction to Computational Biology

COMP 572 Bioinformatics: Network Analysis

### Graphics

COMP 561 Geometric Modeling

### Logic and Automata

COMP 507 Computer-Aided Program Design

### Architecture

COMP 522 Multi-core Computing

### Compilers

COMP 515 Advanced Compilation for Vector Parallel Processors

COMP 535 Approx. Computing System for Big Data, Supercomputing and Embedded Systems

### Systems

COMP 530 Database System Implementation

COMP 532 Introduction to Distributed Computer Systems

COMP 533 Introduction to Database Systems

COMP 524 Mobile and Wireless Networking

COMP 529 Advanced Computer Networks

COMP 528 System-Level Virtualization

## VIII. Additional Academic Requirements

### Department Colloquia

Department colloquia are regularly scheduled throughout the academic year. These talks are intended to expose students and faculty to diverse research areas in Computer Science at a level appropriate for specialists and non-specialists alike. Graduate students are required to attend.

### Progress Reports

Each M.S./Ph.D. student will write an online progress report once a year after the end of the Spring semester. In their narrative, students should discuss any progress they have made in the following areas since their last report:

1. Courses, with grades
2. Exams - C-Exam, thesis proposal
3. Masters Degree
4. Admission to candidacy
5. Journal papers submitted or accepted
6. Workshop or conference papers submitted or accepted
7. Workshop or conference presentations
8. Software development
9. Scholarships or fellowships
10. Awards
11. Internships
12. Any other relevant information that might help their advisor and the Graduate Committee assess the student's progress, including illnesses or personal problems.

Students should also discuss their plans for the next year and provide an expected graduation date.

First year Ph.D. students should discuss their progress towards finding a research advisor.

The advisor and the Graduate Committee will assess each student's progress based on their report, and each student will receive online feedback. Students who receive an *Unsatisfactory* assessment from the Graduate Committee will be placed on academic probation. Students who receive two consecutive *Unsatisfactory* assessments will be dismissed from the program. Students who are dismissed can appeal to the Computer Science faculty. All of the Computer Science faculty members will meet and make a final decision regarding the student's dismissal.

## **IX. Miscellaneous**

### **Stipend Payments**

Research assistantships and special fellowships (e.g., NSF Fellowships) are usually paid on a 12-month basis. Rice fellowships, awarded to incoming students, are paid on a 9-month academic year basis.

Stipends may also be paid during the summer for work on research projects. A student who works for a full summer will receive six paychecks on the 15th and the last day of the summer months.

Students that receive a stipend from any source through Rice University will be paid semi-monthly on the 15th and the last day of each month. (In the event that one of these days falls on a weekend or holiday, payments will be issued the prior working day.) The first payment of the academic year will be issued on August 31st and the last (of 18) on May 15th. Due to the break between the fall and spring semesters, two payments are issued on December 15th and none on December 31st. Continuing graduate students will receive their last summer stipend payment on August 15th.

Checks or deposit notifications are distributed through the department offices. Upon request, the university will deposit stipend payments directly to your bank account rather than issuing a check. Department staff can provide you with a form authorizing payroll to make a direct deposit.

### **Health Insurance**

Rice University requires that all students have health insurance. Students may either provide the Rice Cashier with proof of medical insurance or purchase health insurance from Rice University. All on-site students are required to pay a Health Center Fee, regardless of whether they purchase Rice University medical insurance or are covered by some other agency. Further information can be found at <http://studenthealthinsurance.rice.edu>. A medical insurance subsidy towards purchase of the Rice medical plan is available to full-time doctoral students in their first eight years of doctoral study.

### **Building Access**

The department coordinator will authorize issuance of door keys for student offices, as well as to any other areas to which access is needed. All keys must be returned when a student leaves permanently. Keys may not be duplicated under any circumstances. A number of buildings, such as Duncan Hall, have card-controlled locks that will accept any valid Rice ID, but specific authorization is needed for most other buildings and labs, including Symonds Lab. Faculty can authorize access, as required.

### **Mail**

All graduate students have an assigned mailbox in Duncan Hall 3141. This box will be used for official correspondence and any other mail that arrives at the CS department office. You should check your mailbox regularly.

### **Office Supplies**

The department stocks and provides supplies for academic and administrative use in Duncan Hall 3140. Please consult the office staff regarding items you need that are not available. To keep costs reasonable, please do not obtain supplies elsewhere. (The campus store, in particular, is much more expensive than our regular suppliers. Research Accounting will generally disallow charges at the campus store.) Items that could be construed as office supplies, such as special paper, plotter pens, or printer cartridges, must be charged as laboratory supplies if they are actually used solely for research purposes. Research funds may not be used for general-use office supplies.

### **Printers and Copiers**

A copy machine is located in Duncan Hall 3141, and two printers (Phast and Phaster) are located in Duncan Hall 3058. Both are available for research and departmental use as needed. Personal use of copiers and printers is not allowed.

### **Mailing and Shipping**

Internal university mail and external US mail can be placed in the appropriate bins located in Duncan Hall 3141. Stamps for US mail will not be supplied.

The department will pay postage for all university business and for routine research-related correspondence, including grant proposals, journal submissions, paper reviews, and small numbers of preprints. Large batches of preprints and other research-related shipping must be charged to the appropriate grant. To send packages by DHL, UPS, or FedEx, seek assistance from the department staff.

### **Travel**

Student travel must be authorized by the Department Chair or the Principle Investigator of the project to which the travel will be charged. The Dean and the department can sometimes provide supplemental funds for students presenting papers at conferences and workshops. Contact the Department Chair to request this assistance. When preparing for a trip, please give the department staff your itinerary and the account number(s) to be charged. Note that most grants require the use of US carriers. Travel expense documentation should be submitted within three days after returning from a trip. The following original receipts must be supplied: Airline tickets, hotel receipt, car rental receipts (these must show amount charged), as well as miscellaneous items, such as taxi, bus, and registration fees.