Academic Year 2024-2025

School of Computer Science

The Robotics Institute

Graduate Student Handbook

Degree Programs Covered by This Handbook:
- Master's in Robotics (MSR)
- Master's in Robotics Systems Development (MRSD)
- Master's in Computer Vision (MSCV)
- PhD in Robotics (PhD)

Table of Contents

Welcome & Introduction

We are proud of the open, friendly culture that has been the hallmark of the Robotics Institute (RI) since its inception. Faculty keep their office doors open to encourage informal meetings with students and colleagues. Graduate students organize department-wide social activities, ranging from Friday afternoon get-togethers to rock climbing trips. In addition, the department's strong support for collaboration creates an ideal environment for world-class robotics research.

RI is an intellectually diverse, multi-disciplinary department. Our faculty and students come from a wide variety of backgrounds and represent many unique areas of expertise. This diversity stems from the multi-disciplinary nature of robotics, which encompasses aspects of computer science, mechanical engineering, electrical engineering, psychology, and many other disciplines.

RI was established in 1979 to conduct basic and applied research in robotics technologies relevant to industrial and societal tasks. Seeking to combine the practical and the theoretical, RI has diversified its efforts and approaches to robotics science while retaining its original goal of realizing the potential of the robotics field.

RI is an international leader in robotics education. The world's first Robotics Ph.D. program was founded here in 1988 with the goal of providing graduate students with the knowledge, experience, and skills to become the next leaders in robotics research and education. Graduates from the Ph.D. program have taken on roles ranging from faculty in top universities, to designing and controlling Mars rovers, to developing self-driving cars. We have steadily grown and expanded our programs of study over the years.

Today, we offer diverse opportunities at all levels of education - from master's programs and an undergraduate degree to K-12 where our renowned programs, workshops, and summer classes inspire and educate the next generation of roboticists. Even when robotics technologies were primitive, their ability to boost the productivity and stature of the United States was foreseen in the evolving global marketplace.

Matthew J. Roberson
Robotics Institute Director

While this handbook is specific to your academic experience in the department, it is just one element of the **Graduate Student Handbook Suite**. Here are several other resources within the suite that you should consult when needed:

- The Appendix for your program at the end of this Handbook
- University-Wide Graduate Student Handbook: [Office of Graduate & Postdoctoral Affairs](#)**>Resources**
- [The Word Student Handbook](#)

2. Robotics Institute Vision, Mission, and Values

2.1: **Vision**
Since its founding, the Robotics Institute (RI) at Carnegie Mellon University continues to be the preeminent collaborative hub for the world's visionaries in robotics. As the pioneers of computer science-based robotics, our approach to research, development and implementation is rooted in interdisciplinarity and is guided by computational thinking, so that we may build premiere real-world solutions that serve the breadth of humanity.

2.2: **Mission**
RI brings together the top scientific minds, intent on solving humanity's toughest challenges through robotics. Encompassing the practical and the theoretical, we push the boundaries of collaboration to develop interdisciplinary solutions touching every aspect of human life—making things safer, more efficient, and more productive. We educate, mentor, and empower the brightest and most ambitious roboticists to anticipate the future, and then to build the robotics we need to take us there.

2.3: **Values**
Every voice matters and creativity and ingenuity thrive.
All individuals are welcome. All ideas are significant. All points of view are critical. Our influence is amplified by the people who choose to be here. We cultivate sheer talent and brilliance to produce the robotics leaders the world needs.

What we build has the power to change almost anything for good.
Our sense of responsibility guides and unites us. Because we have the capabilities and technologies to offer a brighter future, it is on us to find solutions and fuel essential progress.

We are always the revolutionaries of robotics.
For decades, we have been intrepidly driving the field forward—for the betterment of society and the lives of people everywhere.

Together, even moonshots are within our reach.
At the intersection of collaboration, ambition, and hard work, we believe anything is possible.

3. Degrees Offered

MS in Robotics (MSR)
MS in Robotic Systems Development (MRSD)
MS in Computer Vision (MSCV)
Doctor of Philosophy (Ph.D.) in Robotics
      Dual Degree Ph.D. Program in Robotics (CMU Portugal)
      Center for the Neural Basis of Cognition Option (CNBC)
      Students must be separately admitted to the CNBC program; they fulfill the same basic requirements as regular Ph.D. students in Robotics and have additional requirements to fulfill.
Bachelor of Science in Robotics
      Additional Major in Robotics
      Minor in Robotics
      Accelerated Graduate Program: enables current Carnegie Mellon undergraduates' access to an abbreviated application for early admission to the MS in Robotics (MSR) program.

4. SCS & RI Department Personnel

As already mentioned, we are proud of the open, friendly culture that has been the hallmark of the Robotics Institute (RI) since its inception. Faculty keep their office doors open to encourage informal meetings with students and colleagues. Graduate students organize department-wide social activities, ranging from Friday afternoon get-togethers to rock climbing trips. In addition, the department's strong support for collaboration creates an ideal environment for world-class robotics research. Feel free to reach out to anyone in the RI department and/or School of Computer Science (SCS) as needed.

Key Contact	Name	Role
Dean, School of Computer Science	Martial Hebert	Dean of SCS
Associate Dean for MS Programs	David Garlan	Associate Dean level signatures
Director, RI/Professor	Matthew Johnson-Roberson	Director level signatures
Director of Education, RI/Research Professor	George Kantor	Form signatures
Program Director, PhD, RI/Research Professor	David Wettergreen	
Program Director, MSR Principal Systems Scientist	Dimitrios (Dimi) Apostolopoulos	
Program Director, MRSD Principal Systems Scientist	John M. Dolan	Internships, projects, career advising
Program Director, MSCV Associate Professor	Michael Kaess	Internships, projects, career advising
Education Team/Academic Program Manager	Barbara Jean (BJ) Fecich	MSR, Undergraduates; Admissions, Advising
Academic Program Manager	Sarah Conte	MSCV, MRSD; Admissions, Advising
Academic Program Manager	Suzanne Lyons Muth	PhD; Admissions, Advising
Senior Academic Coordinator	Samantha (Sam) Bridge	Undergraduates

Senior Academic Service Officer	Jean Harpley	Courses, Waitlists, TA's

Administrative + Other		
SCS Help	help@cs.cmu.edu	Printing & Technology Needs
Assoc Dir Finance & Administration	Cheryl Wehrer	Administrative oversight
Senior Administrative Coordinator -	Tracy Linza	Funding coordinator
Administrative Coordinator	Christine Downey	Purchasing Assistant
RI Department Reception	Victor Valle	RI Mailroom, access to Robolounge, etc.
Community Health & Well-Being	Angie Lusk	Student Affairs Liaison for SCS

5. Departmental Resources

Bulletin Boards: Students are welcome to post flyers, advertisements, etc. to any bulletin board in Newell Simon Hall (NSH) common spaces (i.e., outside of elevators). RI Graduate students may use e-mail distribution lists to communicate messages to one another. Information about email distribution lists can be found in the Roboguide.

Mail: The RI mailroom is located on the fourth (4th) floor of Newell-Simon Hall (NSH). Please follow these **Roboguide instructions for sending + receiving packages.**

Department Computer Clusters: Students should use the on-campus computing facilities offered by Computing Services. Students should adhere to the Computing Policies and Guidelines.

Copy Machine Availability: As a courtesy, RI Graduate students have access to the machine on the 4th floor of NSH. Students must use their password to log in; then they can print, make copies, scan documents, and send faxes. Any issues with the copy machine should be promptly reported to Becky Klaas. Questions about connecting to printing are to be directed to SCS Help.

Students may also use public "Andrew" printing. All campus affiliates are allotted a per-semester print quota which is debited as you print. Some locations offer color printing and special paper sizes. Instructions on installing the print drivers and other questions can be found here. General instructions for using printers and copiers can be found here.

Workspace: RI Master's Students are welcome to use the RoboLounge (NSH 1512) as well as any SCS common space in NSH and GHC. Students may also access conference rooms after hours. Students are expected to return rooms to their original condition after use. In addition, review the Graduate Student Space webpage on the RoboGuide for more details about which rooms are available for which types of activity (Ex: quiet study, eating, group meetings, etc.).

Department Office/Building Security, Repairs and Services: The **SCS Building Facilities group** manages all initiatives and issues pertaining to the physical spaces occupied by the School of Computer Science, including RI. Please report any damages, needed repairs, and/or security concerns, both for routine requests and emergencies to this team.

Key/Access Card distribution and tracking: email building@cs.cmu.edu for an appointment. Valid CMU ID is required. Certain labs in SCS manage their own key distribution. If you need a key for a lab, please verify with the lab owner/personnel first. If you are locked out of your office after-hours, CMU Police can provide access. Call 412-268-2323. Any keys received from the RI Department, for any reason during your

program should be returned upon an office move, degree completion, and/or when they are no longer needed.

Access card administration
Your CMU ID card will open the exterior doors of most CMU buildings after regular business hours and on weekends and holidays. However, you may also require access to departmental corridors on certain floors within SCS buildings. Stop by GHC 4107 or submit a request to get those access privileges. The nine-digit number from your CMU ID card is required to complete this process.
Lost CMU ID Card: the HUB handles ID Card and Plaid Cash services for the entire campus community. The HUB is on the lower level of Warner Hall. Visit their website for more information.

Purchasing and Reimbursement Procedures and Policies: CMU has detailed and strict policies relating to the purchase of goods, services, equipment, etc. whether using a general ledger account, restricted accounts, or grants. There are also reimbursement policies, along with tax-exempt considerations.

RI & SCS Graduate Student Organizations
The Graduate Student Assembly (GSA) is the branch of student government that represents all graduate students at CMU. GSA maintains an e-mail distribution list that students can subscribe to called GSA-Happenings. Your RI GSA representatives are elected "for life," which means once elected, the Reps can stay on till until they graduate with an option to voluntarily "retire" anytime. GSA does have mandatory attendance policies; if a rep fails to attend a certain number of meetings a year, that rep is automatically removed from the post, triggering an election in the RI Department. RI's current representatives can be found here.

Women@SCS aims to create, encourage, and support academic, social, and professional opportunities for women in computer science and to promote the breadth of the field and its diverse community.

Dec\5 is a social organization that encourages interaction between different Departments and Industry partners within SCS.

RISO is the Robotics Institute Student Organization. It organizes social events and trips, maintains the RoboLounge, and is also involved in the strategic long-term planning of RI. We encourage you to engage and volunteer with RISO as your interest and time allows. Please email RISO for more information.

Department Approach to Press and Media Relations
To ensure consistency in all communications and to maximize external visibility to targeted audiences, the marketing and communication staff works together to coordinate key messages and activities involving publicity. **The Senior Director of media relations in the SCS Dean's Office is Aaron Aupperlee**. He is the point of contact between news media and the School of Computer Science community. When you have media questions, suggestions, concerns, first contact the RI media team. They will coordinate with Aaron when appropriate. He can assist the RI media team with strategic planning for publicity, interview preparation, and (depending on the specific project or issue) may assist in developing news stories or multimedia for the SCS website and social media channels NOTE: **SCS at a Glance info is included in the above link**.

Department/College/University Brands and Logos
The CMU Brand
RI Department Branding and Identity information: see Roboguide

6. Advising

6.1: Role of an Advisor and Advisor Assignments

RI Graduate students are advised by their Program Director and the Program Manager. In general, the role of an advisor is to provide support. Students are fully responsible for their own academic progression and the timely meeting of requirements. Students are welcome and encouraged to seek out faculty and other resources for specific technical guidance as needed.

> **IMPORTANT:** Any faculty member accepting a Master's student advisor relationship is never financially responsible for the Master's student, except in the rare cases when a research assistantship has been explicitly negotiated. A Master's student advisor must have a faculty appointment (formal or courtesy) within RI.

6.2: Advisor/Advisee Collaboration

Your advisor's role may change over the course of your graduate studies
It can include advising on classes, research methods and processes, writing, publication process, conference presentations, thesis writing and presentation and a job search. You and your advisor will mutually agree upon meeting frequency, meeting purpose, required meeting preparation and any other guidelines necessary to ensure a successful relationship.

Research management, time management, and work expectations.
You will want to discuss these topics with your advisor(s):
- How research project assignment will be made
- Reporting requirements, including responsibility for budgets and appropriate charges
- Safety requirements in laboratories and studios
- Management of research support: undergraduates or new graduate students
- All publication expectations and processes - decisions of authorship lineup, writing responsibilities, determination of when a publication is ready for submission
- Faculty's responsibility for monitoring the integrity with which the research is carried out
- Your responsibility for accurate record keeping and the ethical responsibilities of your research endeavors

Attending conferences and meetings: ensure you have a clear understanding of:
- Funding resources
- Determination of submission of abstracts for presentation or publication
- How decisions will be made about who represents the research at conferences, and the protocols of representing Carnegie Mellon at conferences.

Respect and confidentiality.
Remember to maintain the confidentiality of research projects and publications. All Master's students are expected to respect the principle of confidentiality among and between group members.

Communication is KEY
Maintain open lines of communication, respond to one another in a timely fashion, address conflicts respectfully and seek guidance when needed, clearly define timelines and expectations.

6.3: Review/Redress of Academic Conflicts

RI Graduate students who feel the need to address academic concerns should start with specific Program representatives and escalate, as necessary.

Program Level: **Start HERE**	RI Department Level: 2nd	SCS Level: 3rd
Program Chair and Program Manager	Education Team Manager Associate Director of Education Department Director	Associate Dean: Master's Programs SCS Dean

George Kantor, David Wettergreen, and Dimi Apostolopoulos serve as ombudspersons for graduate students to assist with difficult academic or personal situations where a confidential sounding board and/or an intermediary can be helpful. Feel free to reach out to them directly. Examples of situations where students are encouraged to seek advice or assistance include:

- o Difficulty in communications with advisor, particularly when those difficulties may lead to considering changing advisors or leaving the program.

- o When conflict with other group members is difficult to resolve within the group.

- o Issues related to diversity or the departmental climate for those in groups who are historically underrepresented in science.

- o Personal concerns that interfere significantly with the ability to make timely progress in research or program requirements. These might be due to health, family, or financial challenges.

7. Graduate Degree Requirements

7.1: Residency Requirements
Students are required to complete the course requirements in their entirety at the Carnegie Mellon University - Pittsburgh campus. RI does not offer an option for distance learning. Students are required to be present on campus to complete all course requirements. In addition, U.S. government regulations require F-1 and J-1 international students to be enrolled in an in-person degree program, with in-person coursework.

7.2: Registration Process
All RI Graduate students are responsible for managing their registration via the Student Information Online (SIO) portal.

7.3: Required Units for Degree Attainment: See PhD Course of Study Section

7.4: RI Policy on Double Counting Courses
Students in an RI Graduate program are prohibited from double-counting courses. A course that has been counted towards another degree cannot be counted towards fulfilling course requirements for your Graduate Program. Courses may not count for more than one requirement within a Graduate program.

7.5: RI Policy for Courses Outside the Program Curriculum
Graduate Program curriculums are designed to occupy a student's full-time effort. Due to the intensive and collaborative nature of the program, the RI Department will not permit students to take more than the units required for program progression / degree completion. The maximum number of units permitted is set at

the program level and cannot be raised. Course audits are included in the unit max, max units will not be increased to allow a student to audit a course.

7.6: RI Teaching Requirements/Opportunities

All interested RI Graduate students are required to have a certain level of fluency in English before they can instruct in Pennsylvania, as required by the English Fluency in Higher Education Act of 1990. Through this Act, all institutions of higher education in the state are required to evaluate and certify the English fluency of all instructional personnel, including teaching assistants and interns. View the full university policy here.

The fluency of all instructional personnel will be rated by Language Support in the Student Academic Success Center to determine at what level of responsibility the student can TA. In addition to administering the International Teaching Assistant (ITA) Test (a mandatory screening test for any non-native speaker of English), Language Support in the Student Academic Success Center helps teaching assistants who are non-native English speakers develop fluency and cultural understanding to teach successfully at Carnegie Mellon.

7.7: Requirements for Application/Consideration for Entry into PhD Program

7.8: Course Categories

Core Course: A core course is one that satisfies a core requirement for one or more RI degree programs (PhD, MSR, MRSD, MSCV). Core courses are offered at least once per year and offered in consistent semesters so students can plan accordingly (e.g., a core class is offered every Spring, it does not frequently switch between Spring and Fall). The course has lectures and multiple graded assessments (problem sets, quizzes, exams, projects, etc.).

Regular Course: A regular course has an established curriculum and is taught on a regular schedule, at least once every two years. The course has lectures and multiple graded assessments (problem sets, quizzes, exams, projects, etc.). If the faculty member who usually teaches a regular course is unavailable in the semester when the course is usually offered, RI will try to offer the course with a different instructor, but if one cannot be found the course will not be offered that semester. Regular courses can be used to partially satisfy the PhD specialized qualifier.

Special Topics Course: A special topics course is a new or experimental course where there is no commitment to offer on a regular basis. The course has lectures and multiple graded assessments (problem sets, projects, etc.). If the faculty member who usually teaches a special topics course is not available to teach it in a given semester, it is not offered that semester (i.e., no attempt is made by RI to find a substitute instructor). Special topics courses may be transitioned to regular courses with an assigned permanent course number if they have been offered for two consecutive years, maintained significant enrollment, and have a commitment from the instructor to regularly offer the course. Special topics courses can be used to partially satisfy the PhD specialized qualifier.

Seminar Course: A seminar course is one that is created by an instructor in order to explore a contemporary research topic. Seminar courses may have some instructor-led lectures, but the

primary activity in the course is reading, presenting, and discussing papers. Seminar courses do not have formal assessments beyond class participation. Seminar courses sometimes evolve into courses with a more formal curriculum by adding lectures and assessments. When this happens, a seminar may be converted to a special topic or regular course. Seminar courses cannot be used to partially satisfy the PhD specialized qualifier, nor are they pre-approved as electives for MSR, MRSD, MSCV programs.

Challenge Course: A challenge course is one that is created by an instructor to organize a student team to compete in an externally organized challenge program. Challenge courses may or may not have formal lectures. Challenge courses must have stated learning objectives and student performance assessments, but these can be more loosely defined than those of regular courses. Challenge courses are offered during the time when the external challenge is active and are no longer offered when the challenge is completed. Challenge courses can be used to satisfy at most one course in the PhD Specialized Qualifier. In Master's programs, challenge courses may be used to satisfy at most one elective.

	Satisfies requirements	Offer frequency	Curriculum	TAs	Course number
Core Course	core	every year	lectures and assessments	normal schedule	Permanent
Regular Course	electives / specialized qualifier	at least once every 2 years	lectures and assessments	normal schedule	Permanent
Special Topics Course	electives / specialized qualifier	not offered regularly	lectures and assessments	normal schedule	Temporary, prepend "Special Topics:"
Seminar Course	not for PhD SQ; with chair approval for MS	not offered regularly	read and discuss papers	none	Temporary, prepend "Seminar:"
Challenge Course**	Limit of one as elective or SQ	offered during challenge	pursue challenge tasks	normal schedule	Temporary, prepend "Challenge:"

**Courses offered in the past that would qualify as a Challenge Course include 16-663 (F1Tenth Autonomous Racing) and 16-873 (Spacecraft Design-Build-Fly Laboratory). Going forward, eligible RI challenge courses will be identified as such in their course descriptions.

8: RI Department Policies & Protocols

8.1: Department Policy for Withdrawing from a Course
Students taking undergraduate and/or graduate level courses must follow the procedures and deadlines indicated by the Registrar's Office for adding, dropping, or withdrawing from courses as identified on the academic calendar. **NOTE: There is a separate calendar for doctoral-level courses.**

8.2: New Policies / "Grandfather" Policy
When policies are changed it is because the department believes the new rules offer an improvement. Currently enrolled students whose degree program is affected by a change in policy may choose to be governed by the old policy that was in place at the time of their matriculation or the new policy. In the event degree requirements are changed and certain courses are no longer offered, the department will try to find some compromise that allows those students to satisfy the original requirements.

8.3: Time Away from Academic Responsibilities
RI Graduate students should not assume that their time off follows the academic calendar of courses. For many graduate degree programs, there is an expectation that graduate students continue research during academic breaks and time away from campus, which may or may not be negotiated with the students. If there are requirements for student time beyond a typical weekday or work week, this should be specified.

University Holidays are also student holidays, and students need to consult their faculty about coverage if they have challenges with taking time off during University Holidays. For example, if experiments are running that need to be monitored continuously, students should speak with their faculty about arrangements to take an equal number of days off at another time.

8.4: RI Department Bereavement Policy
Students are eligible for protected bereavement leave if they experience the loss of an immediate family member. "Immediate Family" includes, but is not limited to, a spouse or registered domestic partner, child/stepchild/unborn child, parent/stepparent, sibling/stepsibling, grandchild, grandparent, parent-in-law/parent of registered domestic partner, and sibling-in-law/sibling of registered domestic partner.

Under this leave, all full-time and part-time graduate students are excused from class for at least five (5) working days for each eligible death. These days may be used non-consecutively. Full-time and part-time graduate students are also absolved of research duties while on leave and are eligible to continue receiving any uninterrupted pay (if they are funded) related to the relevant funding support during this period.

Additional Travel Days

In addition to the excused academic days, students may request up to three (3) additional working days of leave to account for travel considerations. Please see "Process and Notification" for more details on how to request this additional time.

Process and Notification

Arrangement and approval of leave and extension of assigned work should begin as soon as you learn of the death of a member of your immediate family. Students should notify their academic advisor, who can help coordinate with course instructors about the student's absence on their behalf. Students should additionally contact their research advisor.

Stipulations

While this policy excuses a student from class attendance, the student remains responsible for all material covered in class and must work with each individual professor upon return to complete any required work. Graduate students are similarly expected to work with their research advisor to ensure that they get back on track with their research upon their return.

Students should also note that, while academic advisors will make every effort to assist students in getting their leave fully approved, subject to the requirements for their courses/research; approval is at the final discretion of the course instructor/research advisor.

Additional Leave

The total time of the bereavement leave should be agreed upon by the student and their teaching/funding professors based on their needs and circumstances, with the minimum offered time set at five (5) working days (with additional travel days as needed). Considerations for duration include, but are not limited to, physical recovery (in the case of additional injury or recovery after stillbirth), and accommodation for new and resultant arrangements (childcare, managing the estate of the deceased, etc.).

Should the student need leave of more than five (5) working days, or any other support, they are encouraged to reach out to RI Cares representatives in the department and/or their research advisor to work out accommodation.

9: Grading & Evaluation: Doctoral Student Appendix

9.1: Satisfactory Academic Standing

Any student who fails to achieve the minimum QPA, infringes the Academic Integrity policy, or otherwise fails to make appropriate progress toward graduation, falls out of Good Standing in the Program. Academic integrity on research papers, including a dissertation, is also enforced strictly; citations are required to avoid plagiarism, including self-plagiarism.

The first time a student falls out of Good Standing, the student is subject to Academic Probation, which serves as a warning to the student and may also trigger supportive actions on the part of the Program, such as advising meetings, reduced maximum course loads, and/or ineligibility for Research Assistantship funding.

If after one semester the student has not returned to Good Standing, or should a student fall out of Good Standing more than once during the Program, the student is subject to Academic Suspension, which is a mandatory, but temporary, leave from the University. It serves as an opportunity for the student to re-evaluate goals, reflect on the requirements for success, and return to the University better prepared to succeed.

Any student previously placed on Academic Suspension who fails to remain in Good Standing may be dismissed from the program (i.e., expelled). Dismissal indicates a complete and permanent separation of the student from the Program.

Elevated levels of misconduct, either within or outside of a class setting, may upon recommendation by the Chair of the Program and confirmation by the RI Associate Director of Education and the RI Department Head, result in Academic Probation, Suspension, or Dismissal, potentially during a semester.

Students will receive official notice of academic actions, such as the imposition or removal of probation, in the form of a letter mailed to the "permanent address" on file with the University via SIO.

The Department Head's determination may be appealed; however, probation or suspension will remain in effect during the appeal. Please refer to the CMU **Summary of Graduate Student Appeal and Grievance Procedures** should you wish to appeal any/all decisions.

10: Funding & Financial Support

10.1: Travel/Conference and Research Funding

The RI Department does not provide funds for travel or conferences. Funds are available for students to attend a conference, whether as a participant or as a presenter, from GSA and the Provost's Office. The application process is managed by the Office of Graduate and Postdoc Affairs. Students can find more information about the application process and deadlines here.

10.2: Department Policy on Outside Employment

Due to the time-consuming nature of RI Graduate Program studies, students are advised not to accept employment while enrolled in the program as a full-time student. International students must contact the Office of International Education regarding eligibility to hold employment.

Doctoral Student Appendix

PhD Course of Study

Advising

Individual Development Plan (IDP)

An Individual Development Plan (IDP) serves as a guide for, at minimum, an annual conversation between you and your advisor. An IDP is meant to promote professional and personal growth by formally documenting your goals and facilitating dialogue, collaboration, and accountability between you and your advisor.

Your IDP is a dynamic roadmap tailored specifically to your academic and career goals, as well as your overall professional development and personal well-being. The IDP is meant to augment the mentoring relationship between you and your advisor by giving direction to your discussions and shaping the process for individual outcomes. IDPs are not for evaluation and assessment of your progress. **Review of your progress happens at the end of each academic semester at the Doctoral Student Review meeting.**

Changing Advisors

When advisors leave/terminate, their student is expected to match with a new advisor as soon as possible and ideally no later than the following Doctoral Student Review Meeting. Student funding is maintained through N-1 semester (support not guaranteed past next term).

Doctoral Degree Requirements and Related Policies/Protocols

Registration Process

During the fall and spring semesters, Ph.D. students should normally be registered for 48 units. During the summer, students should normally be registered for 36 units. It is the full responsibility of the student to register for courses. Each semester, PhD students should consult with their advisor/s before registering for courses.

Expected Timeline

The following table indicates estimates for an appropriate distribution of effort in the Ph.D. program. It is based on actual student performance over the past few years; it also corresponds to the faculty's judgment of realistic estimates of the time required by various components of the program. These figures are meant to be suggestive, not prescriptive. We present them so that all faculty and students can develop a shared image of the expectations of the program.

COMPONENT	INTENSITY	DURATION	TOTAL TIME
Robotics Orientation	full-time	one week	one week
Courses	1/2 time	1 sem each	4 sem
Teaching	1/4 time	2 sem	2 sem
Skills	variable	variable	variable
Directed Research	1/2 time	*	5-7 sem
Thesis Proposal	1/2 time	2 sem	1 sem
Thesis	full-time	until complete	2-4 sem
Good Works	variable	often	--

Required Units for Degree Attainment

Every student must complete 96 university units (typically 8 classes) worth of graduate courses. In addition, we have defined four breadth core areas in robotics. To ensure that students acquire sufficient exposure to basic knowledge concepts, we require students take at least one class from each of the four core areas. Students can take the remaining courses, totaling 48 units, to gain more depth in their specific area of research.

Research Requirements/Opportunities

Grading system for research

Research is the fundamental part of the PhD program. PhD students will work on research with their faculty advisor. The advisor has the option to give a pass/fail grade for research courses. The default grade is a "P" pass which converts to "S" satisfactory on your transcript. The units with "S" grade are counted toward degree requirements but are not included in your GPA.

It is the responsibility of both the student and their advisor to formulate for each semester a set of reasonable goals, plans, and criteria for success in conducting directed research. Advisors are individually responsible for adequately supervising this portion of the graduate program.

Students should be working on directed research at least half time during the first two years. Once all coursework is completed, the directed research increases to full time (except when serving as a teaching assistant or taking additional courses).

Students should enroll for 24-48 units of Graduate Reading and Research (16-997) for each semester (Fall, Spring and Summer) in which they are active (excludes LOA and ABS status; and dual degree Portugal students). If students choose a Practicum (internship) for directed research, they must complete a form that is available from the Ph.D. Program Manager. To perform a Practicum more than 4 times, they must have prior approval from the Ph.D. Program Chair.

At each semi-annual Review of Progress meeting, the faculty assess the student's previous semester's research progress and the student's next semester's research plans to ensure that the student is making satisfactory progress. The evaluation of a student's progress in directed research often depends on the student having produced some tangible result; examples include the implementation of pieces of a software system, a theoretical advance, a conference paper or journal article, an annotated bibliography in a major area, or, as part of preparation for doing research, a passing grade in a graduate course (beyond the required 96 course units).

Resources and Regulations Governing Research at Carnegie Mellon
- **[Office of Sponsored Programs](#)**
- **[Office of Research Integrity & Compliance](#)**
- **[Intellectual Property Policy](#)**
- **[Policy on Restricted Research](#)**
- **[Human Subjects in Research Policy](#)**

Graduation and Certification of Degree

The Ph.D. Program Manager maintains a [checklist of procedures for scheduling the thesis oral presentation](#) and [completing the other requirements for graduation](#). The Ph.D. Program Manager certifies fulfillment of requirements for graduation only when the final version of the thesis
1. has been approved by the thesis committee, the Department Head, and the Dean, and
2. is submitted to the Ph.D. Program Manager at which time the student will be awarded the degree of Doctor of Philosophy in the field of Robotics.

Students are not permitted to participate in commencement exercises unless final certification has been made. **If the final copy of the thesis is not submitted within one year of the thesis defense, a second defense may be required before making a final certification.**

Leave of Absence and Withdrawal

Students who wish to leave the program temporarily may request a leave of absence by submitting a request to the Ph.D. Program Manager. Leaves are initially granted for a period of no more than one year, but an extension of up to one additional year may be granted under exceptional circumstances. When an extension is granted, the conditions for return must be negotiated with the advisor and the Ph.D. Program Chair prior to returning to the program. Students not in good standing will have conditions for return determined by the Ph.D. Program Chair in consultation with the advisor.

Students on leave of absence should contact the Ph.D. Program Manager two months prior to the end of the leave to indicate their plans for the next year. While a leave can, in principle, start at any time, university regulations allow students to return only at the beginning of a semester (usually late August or early January).

Grading and Evaluation

Grades and Grading

Robotics Ph.D. students may formally register for graduate or undergraduate courses in other departments, in which case they are subject to the grading policies of the University and the department offering the course.

Independent Study

Independent Study (16-995) is a course designed to provide students with an opportunity for intensive study of a subject that is either unavailable or insufficiently covered in regular course work. Independent study is not intended to substitute for existing courses, but to provide the opportunity for specialized educational and research experience.

Any faculty member in the Robotics Institute is eligible to serve as the supervisor of an Independent Study research project. The student must provide a brief prospectus of the project to the faculty supervisor as a basis for reaching agreement on the objectives of the study and provide this to their advisor and to the Program Chair for approval.

Course Audit Policy

Auditing is presence in the classroom without receiving academic credit, a pass/fail, or a letter grade. Audited courses will not count towards your degree requirements. The extent of a student's participation must be arranged and approved by the course instructor. A student wishing to audit a course is required to register for the course, complete the Course Audit Approval Form, obtain permission of the course instructor and their advisor, and return the form to the Registrar's Office prior to the 10th day of class.

Any student enrolled full-time may audit a course without additional tuition charges. Part-time students who choose to audit a course will be assessed tuition at the regular per-unit tuition rate.

Additional Department Policies/Protocols

Computing Resources

In early October, after the matching process, students and advisors will work together to determine computing needs. New students arriving in August without a personal computer may contact the Ph.D. Program Manager to request a loaner laptop for use during the fall semester.

Office Assignment Process

The Ph.D. Program Manager assigns all first year Ph.D. students a desk in the Ph.D. office suite on the first floor of NSH. Located in room 1502, this suite features six offices - 1502 A thru G - situated around a common space where students can study, gather, or socialize. We encourage first year students to use this space, as they will meet people from the entire first year Ph.D. cohort and form bonds and connections.

At the end of the spring semester, first year students are reassigned to offices throughout RI. The assignments are based on many factors including, but not limited to, proximity to their advisor's office or lab space. Much thought and consideration go into the office assignments for rising second year students, and advisors are consulted throughout the process. Offices for rising second year students are usually assigned by early July, with the hope that everyone moves by mid-July so the Ph.D. suite can be prepped for the arrival of the new class of first year students.

Occasionally, we ask students to move at other times of the year to maximize seating efficiency and/or to accommodate for changes in where their advisor is located. We appreciate your patience and understanding if we ask you to move. Jess Butterbaugh (jessb@andrew.cmu.edu) is the RI space manager; please contact her with questions.

Request for Accommodations Process

The process for managing specific requests for office accommodation requires the individual to go through the Office of Disability Resources (ODR). Students with specific seating needs should complete the Online Student Application. Do not worry if you are unsure how to answer some of the questions. Provide as much information as possible within your comfort level. You are welcome to let your advisor, your program manager, or the RI space manager know once you have completed the application so we can anticipate/monitor communication from ODR which is necessary before we can proceed with a seating assignment.

Offboarding or Office Move Checklist

- recycle all papers
- throw away or remove all personal items
- throw away or remove old food and beverage containers and other trash
- return SCS-owned equipment, and/or recycle electronics equipment and accessories
- empty any items stored in lockable cabinets or bookshelves

Funding and Financial Support

Statement of Department Financial Support

All PhD students are guaranteed funding of tuition and stipend during the academic year for five years, if they remain in good standing as determined by the faculty in the Doctoral Student Review. Students are also guaranteed a stipend during their first academic summer. Students evaluated as making unsatisfactory progress (USP or N-1) will continue to receive funding while they work to return to good standing. During that period, they will be given explicit instructions on what is required to return to good standing.

If a student, typically in consultation with their advisor, determines that they wish to change their advising arrangement, they should meet with other faculty members to find a suitable match. During their search, they should continue to work with their current advisor to contribute to and conclude their ongoing research. The student will remain fully supported throughout the transition.

Stipends and Funding Payment Schedule

The stipend is $3,455/month beginning August 16, 2024. Ph.D. students in the Robotics Institute are paid semi-monthly. December stipends are usually distributed a little earlier, due to the holiday season. Check with the Ph.D. Program Manager if you are unclear about the distribution of stipends.

Students who receive stipends that are paid for or administered by the university must sign up for <u>direct deposit</u> as University payroll is a paperless system.

The department provides a dependency allowance that is 10% of the Robotics monthly base stipend per eligible dependent provided that your spouse or qualifying domestic partner earns less than 15% of the stipend amount. There may be limited funds on a year-by-year basis to further increase stipend to off-set the cost of dependents enrolled in the University's Cyert Center. Check with the Ph.D. Program Manager on how to apply.

Summer Stipend

Summer stipend is guaranteed for first year students. After the first full year, a summer stipend is available for most Ph.D. students, particularly for those working on their dissertation. Please note that all financial support is subject to continued satisfactory progress toward your degree.

We believe it is also good for Ph.D. students to gain experience in industry for one or two summers during their career here at Carnegie Mellon. Faculty and staff will provide help in finding suitable summer employment.

Tuition

As long as the student is in good academic standing (regarding grade average, progress in the program, and length of time in the program), full tuition remission as well as the activity, transportation and technology fees will be covered. **For the academic year 2024-2025, this tuition remission is valued at $50,976.** Students are responsible for the costs of purchasing their own books and miscellaneous supplies.

Health Insurance Requirement

All full-time students are required to have medical insurance. Please see the health insurance criteria page for more information about this requirement.

If you elect to enroll in Carnegie Mellon University's Student Health Insurance Plan (SHIP), the University will cover 100 percent of the premium cost for your individual coverage under SHIP. While you will have the opportunity to purchase partner, spouse or dependent coverage under the SHIP plan, the University's support will be limited to 100 percent of the individual coverage amount. Please note that if you wish to elect the required health insurance coverage under an alternate plan, you will not be eligible for the University support referenced here. Charges for the optional vision and dental plans are the responsibility of the student.

Qualifying doctoral students are defined as having full-time enrollment in a CMU doctoral program, are making progress toward their degree in line with program policy and are stipend-supported and not receiving full external support from another source.

Fellowships

We encourage students to seek their own external funding since often the award is prestigious (e.g., NSF or Hertz) or the source provides an opportunity to make professional connections. The Robotics Institute supplements the stipends of students with an outside fellowship, subject to any specific restrictions by the sources of the funding.

Students who are interested in applying for external fellowships should see their advisor or check the on-line information provided by the Office of Scholarships and Fellowships website. The website is an excellent resource for locating an abundance of information regarding available funding for students. If a student receives an external fellowship/scholarship, they must notify Rebecca Klaas, Manager, Finance & Special Projects.

Continuation of Funding

Renewal of your appointment as a Graduate Assistant is contingent upon satisfactory performance. In addition, you must remain in good academic standing and continue to make adequate progress toward your degree as determined by faculty.

Internship/Co-op Requirements and Opportunities

The Robotics Institute recognizes that an external internship can be a valuable educational and research experience, especially if access to proprietary data is required for the student's research. We will allow Ph.D. students to accept up to four external internships during their Ph.D. studies. Interning more than 4 times requires approval from the Ph.D. Program Chair.

International students are required to consult with the Office of International Education for eligibility for work authorization before starting or seeking an internship/co-op or consulting opportunity. International students will benefit from proactively reviewing OIE guidance regarding off-campus work authorization. Off-campus work authorization processing times can take several weeks or months, and international students will benefit from starting the off-campus work authorization process as early as possible.

You must discuss your plans for an internship with your advisor for approval. The summer semester is the optimal time for an internship. Internships during the academic year are rare. The only way to complete an internship during the academic year is to take a Leave of Absence or to adhere to the department rules for Consulting.

Consulting and Outside Employment

Consulting is a privilege, not a right. We grant this privilege for one of two reasons:

> The consulting task is relevant to the student's thesis work or a Carnegie Mellon research project.

> The student has exceptional financial obligations.

Consulting is limited to a maximum of eight (8) hours per week. The work performed must be directly related to your doctoral research. A student who wishes to consult should obtain permission from their advisor and the Ph.D. Program Chair, and **fill out the External Appointment Request form.** We may require that students limit outside employment in order to follow University and government compliance rules.