

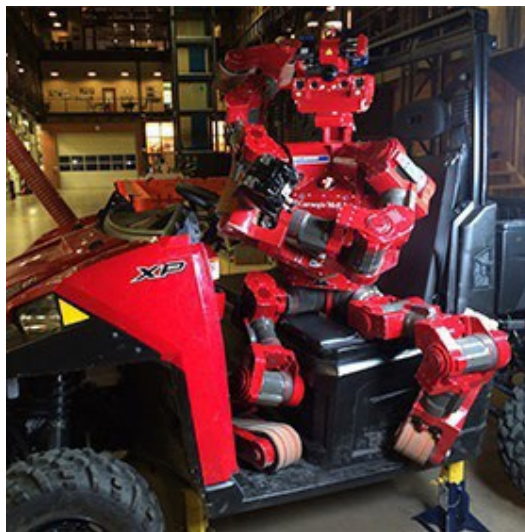
Carnegie Mellon University

Robotics Institute

Graduate Student Handbook

Academic Year 2023-2024

Master of Science in Robotics (MSR)



Last revision date: August 31, 2023

The information contained in this graduate handbook template focuses on the resources and locations available at the Carnegie Mellon Pittsburgh Campus.

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1 Welcome

The Robotics Institute is proud of the open, friendly culture that has been the hallmark of its success since inception. Faculty keep their office doors open to encourage informal meetings with students and colleagues. Graduate students organize frequent 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.

The Robotics Institute is an intellectually diverse, multi-disciplinary department. The Institute's 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 the robotics field, which encompasses aspects of computer science, mechanical engineering, electrical engineering, psychology, and many other disciplines.

Since the start of the Robotics PhD program, we have steadily grown and expanded our programs of study. Today, we offer diverse opportunities at all levels of education: from master's programs and our new Bachelor of Science in Robotics for Carnegie Mellon undergraduate students, down to outreach designed for the K-12 level, where our renowned programs, workshops, and summer classes inspire and educate the next generation of roboticists.

The Master of Science in Robotics program (MSR) brings together areas of robotics research that would otherwise be spread across different departments or separate universities, preparing students to take a leading role in the research and development of future generations of integrated robotics technologies and systems.

While this handbook is specific to your academic experience in the department, there are several other resources and offices graduate students are encouraged to consult during their tenure at Carnegie Mellon University. Information about The Word, the student handbook, the Office of Graduate and Postdoctoral Affairs, the Office of the Dean of Students, and others are included in Appendix A of this handbook.

2 Vision, Mission & Philosophy

2.1 Vision

Carnegie Mellon University will have a transformative impact on society through continual innovation in education, research, creativity, and entrepreneurship.

2.2 Mission

To create a transformative educational experience for students focused on deep disciplinary knowledge; problem solving; leadership, communication, and interpersonal skills; and personal health and well-being.

To cultivate a transformative university community committed to (a) attracting and retaining diverse, world-class talent; (b) creating a collaborative environment open to the free exchange of ideas, where research, creativity, innovation, and entrepreneurship can flourish; and (c) ensuring individuals can achieve their full potential.

To impact society in a transformative way — regionally, nationally, and globally — by engaging with partners outside the traditional borders of the university campus.

2.3 Robotics Institute Philosophy

Even when robotics technologies were relatively primitive, their potential role in boosting the productivity and competitiveness of the United States was foreseen in the evolving global marketplace. The Robotics Institute at Carnegie Mellon University 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, the Robotics Institute has diversified its efforts and approaches to robotics science while retaining its original goal of realizing the potential of the robotics field.

3 Degrees Offered

Graduate Programs

- Doctor of Philosophy in Robotics (PhD): The world's first doctoral program in robotics prepares graduate students to be tomorrow's leaders in robotics research.
- Master of Science in Robotics (MSR): A full 24-month research based master's program that teaches the fundamentals of robotics theory and practice through coursework and independent research.
- Master of Science in Robotic Systems Development (MRSD): A two year (21 month) advanced graduate degree with a combined technical/business focus for recent graduates/practicing professionals engaged in, or wishing to enter, the robotics and automation field as practitioners in the commercial sector.
- Master of Science in Computer Vision (MSCV): A 16-month master's program that teaches the fundamentals of computer vision theory to prepare students for careers in industry.

Undergraduate Programs

- Bachelor of Science in Robotics: An undergraduate program that teaches the principles and practice of robotics through theoretical studies and hands-on experience with robotics.
- Robotics Additional Major: An in-depth understanding of Robotics Engineering and Science for undergraduates.
- Robotics Minor

4 Using the Graduate Student Handbook

This handbook outlines the academic and departmental policies and procedures for the MSR program. Students are encouraged to consult the handbook for guidance about degree attainment and other related topics. In addition to the handbook, students should familiarize themselves with the RoboGuide. Reach out to Barbara (B.J.) Fecich to request this handbook in a different format.

5 Carnegie Mellon University Statement of Assurance

Carnegie Mellon University does not discriminate in admission, employment or administration of its programs or activities on the basis of race, color, national origin, sex, handicap or disability, age, sexual orientation, gender identity, religion, creed, ancestry, belief, veteran status or genetic information. Furthermore, Carnegie Mellon University does not discriminate and is required not to discriminate in violation of federal, state or local laws or executive orders.

Inquiries concerning the application of and compliance with this statement should be directed to the university ombudsperson, Carnegie Mellon University, 5000 Forbes Avenue, Pittsburgh, PA 15213, telephone 412-268-1018. Students can obtain general information about Carnegie Mellon University by calling 412-268-2000.

Carnegie Mellon University publishes an annual campus security and fire safety report describing the university's security, alcohol and drug, sexual assault, and fire safety policies, and containing statistics about the number and type of crimes committed on the campus, and the number and cause of fires in campus residence facilities during the preceding three years. You can obtain a copy by contacting the Carnegie Mellon Police Department at 412-268-2323. The annual security and fire safety report also is available online at www.cmu.edu/police/annualreports.

Information regarding the applicable grievance procedures for alleged violations of the Statement of Assurance is available at <https://www.cmu.edu/policies/forms-and-documents/soa-violations.pdf>. The Office for Institutional Equity and Title IX may be reached at 412-268-7125 or <https://www.cmu.edu/title-ix/>.

6 The Carnegie Mellon Code

Students at Carnegie Mellon, because they are members of an academic community dedicated to the achievement of excellence, are expected to meet the highest standards of personal, ethical, and moral conduct possible.

These standards require personal integrity and a commitment to honesty without compromise, as well as truth without equivocation, and a willingness to place the good of the community above the good of the self. Obligations once undertaken must be met; commitments kept.

As members of the Carnegie Mellon community, individuals are expected to uphold the standards of the community in addition to holding others accountable for said standards. It is rare that the life of a student in an academic community can be so private that it will not affect the community as a whole or that the above standards do not apply.

The discovery, advancement, and communication of knowledge are not possible without a commitment to these standards. Creativity cannot exist without acknowledgment of the creativity of others. New knowledge cannot be developed without credit for prior knowledge. Without the ability to trust that these principles will be observed, an academic community cannot exist.

The commitment of its faculty, staff and students to these standards contributes to the high respect in which the Carnegie Mellon degree is held. Students must not destroy that respect by their failure to meet these standards. Students who cannot meet them should voluntarily withdraw from the university. The Carnegie Mellon Code can also be found on-line at: <https://www.cmu.edu/student-affairs/theword/>

7 University Policies & Expectations

It is the responsibility of each member of the Carnegie Mellon community to be familiar with university policies and guidelines. In addition to this departmental graduate student handbook, the following resources are available to assist you in understanding community expectations:

- The Word/Student Handbook:
<https://www.cmu.edu/student-affairs/theword/index.html>
- Academic Integrity Policy:
<https://www.cmu.edu/policies/student-and-student-life/academic-integrity.html>
- University Policies Website:
<https://www.cmu.edu/policies/>
- Office of Graduate and Postdoctoral Affairs:
<https://www.cmu.edu/graduate/policies/index.html>

Due to the changing nature of conditions and expectations surrounding public health and safety requirements, please visit: <https://www.cmu.edu/coronavirus/> for the most up to date information.

Please see **Appendix A** for additional information about The Word and University resources.

8 Academic Calendar

The Academic Calendar can be found at: <https://www.cmu.edu/hub/calendar/index.html>

It provides information on all deadlines including registration dates, class start dates, add/drop deadlines, exam dates and more.

9 College and Departmental Information

9.1 School of Computer Science

Personnel

Dean, SCS - Martial Hebert

Associate Dean of MS Programs, SCS - David Garlan

Associate Dean for Diversity, Equity, and Inclusion, SCS – Jodi Forlizzi

Resources

SCS Computing Facilities Printer set-up, computer issues, poster printing GHC 4203

SCS Building Facilities Building access, key or office related issues GHC 4107

9.2 Robotics Institute

Personnel

Department Directory: <http://ri.cmu.edu/people/>

Director / Professor - Matthew Johnson-Roberson NSH 4113

Associate Director of Education / Research Professor - George Kantor NSH 1101

MSR Program Director / Principal Systems Scientist - Dimitrios (Dimi) Apostolopoulos NSH 3217

Manager, Academic Programs / MSR Program Manager – Barbara (B.J.) Fecich NSH 1515

Senior Administrative Coordinator -Tracy Linza (Funding coordinator) NSH 4101

Senior Academic Services Officer – Jean Harpley (Courses, Waitlists, TA’s) NSH 1517

Resources

Mail: Personal mail should not be directed to the Robotics Institute. Mail required for business purposes should be addressed as: First/Given Name Last Name

The Robotics Institute, c/o MSR Program
4000B Newell Simon Hall, Carnegie Mellon University
5000 Forbes Avenue
Pittsburgh, PA 15213

RI Graduate Student Space

RoboGuide: Details on common and reservable spaces

<https://roboguide.ri.cmu.edu/human-resources/graduate-space/>

RoboOrg

RI Graduate Student Organization: <https://roboorg.ri.cmu.edu/>

9.3 Department Ombudspersons for Graduate Students

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. Examples of situations where students are encouraged to seek advice or assistance include:

- Difficulty in communications with advisor, particularly when those difficulties may lead to considering changing advisors or leaving the program.
- Conflict with other group members that is difficult to resolve within the group.
- Issues related to diversity or the departmental climate for those in groups who are historically underrepresented in science.
- 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.

If you would like to speak to one of the department ombudspersons, please email or reach out to them directly:

- | | | | |
|-----------------------|--------------|--|----------|
| ○ George Kantor | 412-268-7084 | gkantor@andrew.cmu.edu | NSH 1101 |
| ○ David Wettergreen | | dw0s@andrew.cmu.edu | NSH 2115 |
| ○ Dimi Apostolopoulos | | da1v@andrew.cmu.edu | NSH 3217 |

9.4 Department Approach to Press and Media Relations

To ensure consistency in all communications and to maximize external visibility to target audiences, the marketing and communication staff works together to coordinate key messages and activities involving publicity. The director of media relations in the SCS Dean's Office, Byron Spice, is the point of contact between news media and the School of Computer Science community, including faculty, students, administrators, and staff. He can assist 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.

10 Master's Degree Completion and Certification

10.1 Standard Degree Requirements & Degree Certification

Carnegie Mellon graduate students are expected to complete their degree requirements within the standard length of time for their program of study as outlined in the relevant Graduate Student Handbook. Standard program lengths for graduate students vary significantly – ranging from two semesters for some full-time master's programs to several or more years for doctoral programs. Upon completion of the graduate program degree requirements, the degree will be certified by the student's academic program in the semester in which the student completes the requirements.

Early Competition

Graduate students who consider the completion of all degree requirements in less than the standard length of time for their program of study may consult with their degree-granting program or department to determine if early degree certification is allowed and under what circumstances.

Extended or Longer-than-Standard Competition

Longer-than-standard degree completion may occur due to academic interruptions in making progress toward the degree as defined by the academic program, interruptions of full-time study or progress towards the degree due to serious, documented medical issues, or other unusual or unforeseen circumstances.

Master's students who require longer than the standard time to complete their degree requirements are expected to remain in close contact with their graduate program and will be certified at the end of the semester in which they have completed their degree requirements. Students shall reference CMU Policy on Master's Student Statute of Limitations:

<https://www.cmu.edu/policies/student-and-student-life/masters-students-statute-of-limitations.html>

regarding guidelines and restrictions which place an upper limit on the maximum length of time allowable for master's degree completion and certification.

10.2 Additional Guidance for Students

Program of Study

Students seeking guidance about their program of study and degree requirements should consult with their academic advisor and/or appropriate associate dean.

Financial Aid and Student Account

Students are expected to make normal progress toward their degree in order to graduate within the standard timeframe for their program of study. Under U.S. Federal Title IV regulations, student eligibility for federal financial aid is contingent upon enrollment in and successful completion of courses that are counted as credit toward their current degree program. To receive the maximum amount of federal financial aid for which they may be eligible, students must enroll each semester in at least 36 units that count toward their current degree level. (See separate guidance regarding integrated degree completion.)

Students should consult with their designated college liaison in The HUB regarding billing and financial aid, particularly for early completion, longer-than-standard completion, or integrated undergraduate and master's degree programs.

International Students

Immigration status for students in F-1 and J-1 non-immigrant status is tied to making normal progress toward completing degree requirements. Therefore, F-1 and J-1 students who are considering completing their degree requirements early, anticipating longer-than-standard completion, or moving from an undergraduate to a graduate student classification (integrated undergraduate-graduate study) should consult with their designated advisor in the Office of International Education (OIE) to ensure compliance with immigration regulations.

10.3 Statute of Limitations

As outlined in the Master's Students Statute of Limitations policy:

<https://www.cmu.edu/policies/student-and-student-life/masters-students-statute-of-limitations.html>

Students will complete all requirements for the master's degree within a maximum of seven years from original matriculation as a master's student, or less if required by a more restrictive department, school or college policy. Once this time-to-degree limit has lapsed, the person may resume work towards a master's degree only if newly admitted to a currently offered master's degree program under criteria determined by that program.

Under extraordinary circumstances, such as leave of absence, military or public service, family or parental leave, or temporary disability, a school or college may, upon the relevant department's recommendation and with the written approval of the dean (or designate), defer the lapse for a

period commensurate with the duration of that interruption. Students who are pursuing a master's degree as part-time students for all semesters of their program, as approved by their program, may also appeal to their program or department for extension of the time to degree limit.

10.4 Residency Requirements

Students in the MSR program are required to be full-time degree-seeking students for a minimum of two academic semesters. Exceptions can be granted by the MSR Program Chair for Carnegie Mellon University Staff Enrollees and Carnegie Mellon undergraduates who are admitted via the accelerated pathway.

Full-time status for all students in the MSR Program is 36-48 units each semester. International students must be in full-time status for all semesters and need to consult the Office of International Education if they may not be in full-time status.

Carnegie Mellon Staff Enrollees

Carnegie Mellon staff can enroll in university courses at reduced or zero tuition cost via the tuition remission benefit in Human Resources. Staff can utilize this approach to satisfy the core courses for the MSR program; however, staff should formally apply as soon as possible.

Following acceptance, staff should form their thesis committee and mutually select a faculty advisor. Staff are now eligible to take elective courses and must be enrolled in the MSR program for a minimum of two academic (fall and spring) semesters prior to graduation.

Staff members interested in utilizing the tuition benefits must coordinate directly with Human Resources. If the staff member is here on a visa, it is the staff member's responsibility to ensure they have appropriate status with the Office of International Education to pursue an academic degree.

Students Accepted via the Accelerated MSR Application Enrollees

Carnegie Mellon undergraduates can minimize the two-year program commitment by applying as an accelerated graduate student their senior year. If admitted, accelerated graduate students may take a maximum of the four core courses while still an undergraduate student. Elective courses and supervised research may only be taken upon completion of a bachelor's degree, while enrolled as a graduate student.

To finish the program, students must complete all core courses (as an undergraduate or graduate student), enroll in full-time supervised research the subsequent summer after graduation, register for supervised research and elective courses during the fall and spring semesters and complete their research and thesis requirements in the second summer. This is the earliest possible completion for

the program. Students are also able to utilize the entire two years if they prefer.

Note that courses cannot count toward multiple degrees; therefore, core courses taken as an undergraduate can only be applied toward the MSR degree if they are not used to satisfy any undergraduate degree requirements. Following acceptance, students wishing to complete the program early should form their Master's Committee and mutually select a faculty advisor. This is particularly important for senior undergraduates wishing to begin their research units in the summer, as research units will not count toward the MSR degree unless the student has an approved committee and research advisor.

10.5 Registration Process/Procedures

MSR students are expected to register themselves for 36-48 units during the six semesters of the program (fall, spring, summer, fall, spring, summer). 48 units is the maximum number of units a student can enroll for.

MSR students can register for a maximum of two courses, or 24 units, of academic coursework. MSR students must register for 12-24 units of 16-997 each semester. MSR students receiving Research Assistantship funding, in any form, from their research advisor, are required to register for 24 units of 16-997 by the first day of the semester in which they are receiving funding. Failure to adhere to this policy may result in the MSR student forfeiting their stipend payment for the duration of time they remain under 24 units of 16-997. This is at the discretion of the MSR Program Chair and/or the RI Business Office.

MSR students are permitted to register for any of the core courses at their discretion. Elective courses may only be registered for **after** consultation with the MSR Program Chair, Prof Dimi Apostolopoulos. Elective courses not approved prior to course registration **will not** count towards any requirement for the MSR program.

All academic courses counting towards the MSR program must be taken at Carnegie Mellon University and a grade of a B- or higher must be achieved.

11 Master's Degree Requirements and Related Policies/Protocols

11.1 Core Courses

Research Core Course

A minimum of 84 units of supervised research (16-997) credit is required to graduate. Additional details are outlined in the Research Requirements section.

Academic Core Courses

There are four core academic course requirements in the MSR program. Core courses must be selected from each of the following four areas. These courses are required; substitutions cannot be made.

If admitted into the RI PhD program, the core courses taken during the MSR program can be used towards the core requirements of the PhD program (except for 10-601).

Perception: vision, image sensors, range data interpretation, tactile and force sensors, inertial guidance, and other sensors.

16-720 Computer Vision (Fall and Spring)

This course introduces the fundamental techniques used in computer vision, that is, the analysis of patterns in visual images to reconstruct and understand the objects and scenes that generated them. Topics covered include image formation and representation, camera geometry, and calibration, computational imaging, multi-view geometry, stereo, 3D reconstruction from images, motion analysis, physics-based vision, image segmentation and object recognition. The material is based on graduate-level texts augmented with research papers, as appropriate. Evaluation is based on homework and a final project. The homework involves considerable MATLAB programming exercises.

16-722 Sensing and Sensors (Fall)

The principles and practices of quantitative perception (sensing) illustrated by the devices and algorithms (sensors) that implement them. Learn to critically examine the sensing requirements of robotics applications, to specify the required sensor characteristics, to analyze whether these specifications can be realized even in principle, to compare what can be realized in principle to what can actually be purchased or built, to understand the engineering factors that account for the discrepancies, and to design transducing, digitizing, and computing systems that come tolerably close to realizing the actual capabilities of available sensors. Grading will be based on homework assignments, class participation, and a final exam. Three or four of the homework assignments will be hands-on "take-home labs" done with an Arduino kit that students will purchase in lieu of purchasing a textbook. Top-level course modules will cover (1) sensors, signals, and measurement science, (2) origins, nature, and amelioration of noise, (3) end-to-end sensing systems, (4) cameras and other imaging sensors and systems, (5) range sensing and imaging, (6) navigation sensors and systems, (7) other topics of interest to the class (as time allows).

16-820 Advanced Computer Vision (Fall)

Is intended to move at a slightly faster pace compared to 16-720. This course introduces the fundamental techniques used in computer vision, that is, the analysis of patterns in visual images to reconstruct and understand the objects and scenes that generated them. Topics covered include camera geometry and calibration, multi-view stereo, 3D reconstruction, image detection, segmentation, and tracking, and physics-based vision. The homework involves considerable Python programming exercises.

16-822 Geometry-based Methods in Vision (Fall)

The course focuses on the geometric aspects of computer vision: The geometry of image formation and its use for 3D reconstruction and calibration. The objective of the course is to introduce the formal tools and results that are necessary for developing multi-view reconstruction algorithms. The fundamental tools introduced study affine and projective geometry, which are essential to the development of image formation models. Additional algebraic tools, such as exterior algebras are also introduced at the beginning of the course. These tools are then used to develop formal models of geometric image formation for a single view (camera model), two views (fundamental matrix), and three views (trifocal tensor); 3D reconstruction from multiple images; and auto-calibration.

16-823 Physics-based Methods in Vision (Spring)

Every day, we observe an extraordinary array of light and color phenomena around us, ranging from the dazzling effects of the atmosphere, the complex appearances of surfaces and materials, and underwater scenarios. For a long time, artists, scientists, and photographers have been fascinated by these effects, and have focused their attention on capturing and understanding these phenomena. In this course, we take a computational approach to modeling and analyzing these phenomena, which we collectively call "visual appearance". The first half of the course focuses on the physical fundamentals of visual appearance, while the second half of the course focuses on algorithms and applications in a variety of fields such as computer vision, graphics and remote sensing and technologies such as underwater and aerial imaging.

Cognition: artificial intelligence for robotics, including knowledge representation, planning, and task scheduling.

15-780 Graduate Artificial Intelligence (Spring)

This course provides a broad perspective on AI, covering (i) classical approaches of search and planning useful for robotics, (ii) integer programming and continuous optimization that form the bedrock for many AI algorithms, (iii) modern machine learning techniques including deep

learning that power many recent AI applications, (iv) game theory and multi-agent systems, and (v) issues of bias and unfairness in AI. In addition to understanding the theoretical foundations, we will also study modern algorithms in the research literature.

10-601 Introduction to Machine Learning (Master's) (Fall and Spring)

Machine Learning (ML) develops computer programs that automatically improve their performance through experience. This includes learning many types of tasks based on many types of experience, e.g., spotting high-risk medical patients, recognizing speech, classifying text documents, detecting credit card fraud, or driving autonomous vehicles. 10601 covers all or most of: concept learning, decision trees, neural networks, linear learning, active learning, estimation & the bias-variance tradeoff, hypothesis testing, Bayesian learning, the MDL principle, the Gibbs classifier, Naive Bayes, Bayes Nets & Graphical Models, the EM algorithm, Hidden Markov Models, K-Nearest-Neighbors and nonparametric learning, reinforcement learning, bagging, boosting and discriminative training. Grading will be based on weekly or biweekly assignments (written and/or programming), a midterm, a final exam. 10601 is recommended quantitative Masters students, & non-MLD PhD students.

You can evaluate your ability to take the course via a self-assessment exam (https://www.cs.cmu.edu/~aarti/Class/10701_Spring21/Intro_ML_Self_Evaluation_new.pdf)

10-701 Machine Learning (PhD) (Fall and Spring)

Machine learning studies the question "How can we build computer programs that automatically improve their performance through experience?" This includes learning to perform many types of tasks based on many types of experience. For example, it includes robots learning to better navigate based on experience gained by roaming their environments, medical decision aids that learn to predict which therapies work best for which diseases based on data mining of historical health records, and speech recognition systems that learn to better understand your speech based on experience listening to you. This course is designed to give PhD students a thorough grounding in the methods, mathematics and algorithms needed to do research in and apply machine learning. Students entering the class with a pre-existing working knowledge of probability, statistics and algorithms will be at an advantage, but the class has been designed so that anyone with a strong mathematical and computer science background can catch up and fully participate. If you are interested in this topic, but are not a PhD student, or are a PhD student not specializing in machine learning, you might consider the master's level course on Machine Learning, 10-601." This class may be appropriate for MS and undergrad students who are interested in the theory and algorithms behind ML. ML course comparison:

https://docs.google.com/document/d/1Y0Jx_tcINWQrWJx31WGEQsUs059OUMmPIVSeYxNdeM/edit

16-831 Introduction to Robot Learning (Fall and Spring)

Robots need to make sequential decisions to operate in the world and generalize to diverse environments. How can they learn to do so? This is what we call the "robot learning" problem and it spans topics in machine learning, visual learning and reinforcement learning. In this course, we will learn the fundamentals of topics in machine/ deep/visual/reinforcement-learning and how such approaches are applied to robot decision making. We will study fundamentals of: 1) machine (deep) learning with emphasis on approaches relevant for cognition, 2) reinforcement learning: model-based, model-free, on-policy (policy gradients), off-policy (q-learning), etc.; 2) imitation learning: behavior cloning, dagger, inverse RL and offline RL.; 3) visual learning geared towards cognition and decision making including topics like generative models and their use for robotics, learning from human videos, passive internet videos, language models; and 4) leveraging simulations, building differentiable simulations and how to transfer policies from simulation to the real world; 5) we will also briefly touch topics in neuroscience and psychology that provide cognitive motivations for several techniques in decision making. Throughout the course, we will look at many examples of how such methods can be applied to real robotics tasks as well as broader applications of decision making beyond robotics (such as online dialogue agents etc.). The course will provide an overview of relevant topics and open questions in the area. There will be a strong emphasis on bridging the gap between many different fields of AI. The goal is for students to get both the high-level understanding of important problems and possible solutions, as well as low level understanding of technical solutions. We hope that this course will inspire you to approach problems in cognition and embodied learning from different perspectives in your research. (As of 3/21/2023)

Action: kinematics, dynamics, control, manipulation, and locomotion.

16-711 Kinematics, Dynamic Systems and Control (Fall)

Kinematics, Dynamic Systems, and Control is a graduate level introduction to robotics. The course covers fundamental concepts and methods to analyze, model and control robotic mechanisms which move in the physical world and manipulate it. Main topics include the fundamentals of kinematics, dynamics and control applied to the kinematics, dynamics and control of rigid body chains. Additional topics include state estimation and dynamic parameter identification.

16-741 Mechanics of Manipulation (Spring)

Mechanics of Manipulation is a graduate level course that dives into the fundamentals of robotic manipulation. Through this course you will learn the kinematics, statics, and dynamics

of robotic manipulators as they interact with the world to accomplish tasks. You will gain experience with the intelligent use of kinematic constraint, gravity, and frictional forces. Additional topics include rigid body mechanics, automatic planning based on mechanics, deformable manipulation, and simulation of dynamic manipulation. Applications of robotic manipulation are drawn from physical human-robot interaction, manufacturing, and other domains.

16-761 Mobile Robots (Spring)

The course is targeted to senior undergraduates and graduate level students. The lectures will develop the fundamentals of this emerging sub-field of robotics by calling on the experience of practitioners, the common themes of the literature, and relevant material from more basic fields such as computer vision, mathematics, and physics

Math: signal processing, optimal estimation, differential geometry, and operations research.

16-811 Fundamentals for Robotics (Fall)

This course covers selected topics in applied mathematics useful in robotics, taken from the following list: Solution of Linear Equations; Polynomial Interpolation and Approximation; Solution of Nonlinear Equations; Roots of Polynomials, Resultants; Approximation by Orthogonal Functions (includes Fourier series); Integration of Ordinary Differential Equations; Optimization; Calculus of Variations (with applications to Mechanics); Probability and Stochastic Processes (Markov chains); Computational Geometry; Differential Geometry.

*Standard schedule for degree completion***First year of MSR Program**

Fall	Units	Spring	Units
Core Course	12 units	Core Course	12 units
Core Course	12 units	Core Course	12 units
Reading and Research – 16-997	12 units	Reading and Research – 16-997	12 – 24 units
36 units		36 - 48 units	

Summer One: Reading and Research 16-997 - 12-36 units**Second Year of MSR Program**

Fall	Units	Spring	Units
Elective Course	12 units	Elective Course	12 units
Elective Course	12 units	Reading and Research – 16-997	24 units
Reading and Research – 16-997	12 – 24 units	36 units	
36 – 48 units			

Summer Two: Reading and Research 16-997 - 12-36 units / Complete thesis and graduation requirements.**11.2 Required Units for Degree Attainment**

The MSR requires completion of a minimum of 168 units.

Of these total units, at least 84 units must be comprised of core and elective coursework, and at least 84 units must be comprised of supervised research (16-997). Four core courses and three elective courses are required as part of the 84-credit course minimum as described above.

The 168 units for the MSR degree may not double count for another undergraduate or master's program.

11.3 Electives

The student must take a minimum of 36 units of elective courses, comprising at least 3 elective courses. These can be drawn from appropriate graduate courses in Robotics and in related disciplines at Carnegie Mellon. All Robotics Institute graduate level 12-unit courses (16-600 or higher) are approved electives.

Elective coursework outside of the Robotics Institute must be approved by the MSR's program chair prior to class enrollment. Request approval by emailing the program chair and cc'ing the MSR Program Manager.

11.4 Departmental and MSR Programmatic Policies

Policy on Double Counting Courses

The 168 units for the MSR degree may not double count for **any** other degree.

Program Policy for Courses Outside the Department/College

Elective coursework outside of the Robotics Institute must be approved by the MSR's program chair prior to class enrollment. Core coursework outside the Robotics Institute is approved provided it is outlined in the core courses section above.

Program Policy/Process for Incompletes

Any MSR student who receives an incomplete grade for a course being counted towards the MSR program shall have until grades are due the following semester to resolve the incomplete.

Petition Procedures

An MSR student can petition a policy by making a formal request for review to the Associate Director of Education, George Kantor. Petitions must be made during the semester in which the policy is impacting the student.

Department Policy/Process for Withdrawing from a course

The Robotics Institute requires students to adhere to all timelines set forth by Carnegie Mellon University with regard to withdrawing from a course. This includes, but is not limited to, timelines, permissions, forms, and consequences.

Drop/Add/Withdraw Procedures

Students taking undergraduate and Master's level courses must follow the procedures and deadlines for adding, dropping, or withdrawing from courses as identified on the academic calendar. Information can be found at:

<https://www.cmu.edu/hub/registrar/course-changes/index.html>

There is a separate calendar for doctoral level courses.

11.5 Transfer Courses and Pittsburgh Council on Higher Education (PCHE)

Carnegie Mellon University offers students the opportunity to take courses for credit through a cross-registration program (see Pittsburgh Council on Higher Education (PCHE) and Cross-registration below) and through the receipt of transfer credit from other accredited institutions. The Carnegie Mellon University transcript will include information on such courses as follows: Carnegie Mellon courses and courses taken through the university's cross-registration program will have grades recorded on the transcript and be factored into the QPA. All other courses will be recorded on this transcript indicating where the course was taken, but without grades. Such courses will not be considered for academic actions, honors or QPA calculations.

<https://www.cmu.edu/policies/student-and-student-life/masters-student-status.html>

11.6 MSR Course Waive Policy (Evaluation of Transfer Credit)

Transfer courses are not accepted for the MSR program.

If a student has completed graduate level course work related to the required MSR core courses, they may request a core course waiver. A core course waiver permits the student to take an additional 12-unit approved elective course instead of a course in the core area. The waiver does not provide units for the course nor does the course appear on a student's transcript.

A core course waiver is requested via email by the student to the MSR Program Chair and Program Manager. The student must demonstrate that they have had graduate level course work that covers **every** topic in the course they wish to waive.

The student must include the following components, or the request will not be reviewed:

- Current syllabus for the CMU course the student would like to waive.
- Copies of syllabi from all courses where material was covered.
- Copy of transcript(s) with grades in the courses.
- A .PDF of the topics outlined in the CMU syllabus point by point with outlining of which previously taken course(s) the material was covered and how the material was covered.
- Explanation as to why the other courses in the core area aren't needed.
- Written support from the student's MSR Research Advisor.

Material taken in undergraduate classes, or picked up in any other way besides a graduate class (e.g., no MOOCs, professional experience, self-study, etc.) is not accepted. If a student disagrees with the waiver request outcome, he or she may petition the Associate Director of Education within three weeks (21 days) of receiving the outcome to review the request.

11.7 Background Requirements

It is each student's personal responsibility to arrive with, or to acquire rapidly thereafter, basic understanding (at the level of an introductory undergraduate course) in the following areas:

Mathematics: calculus, linear algebra, numerical analysis, probability, and statistics

Computer Science: programming, data structures, algorithms

Physics and Engineering: mechanics, dynamics, electricity and magnetism, optics

On request, the faculty will advise incoming students about individually appropriate alternative ways to satisfy these requirements, e.g., taking an undergraduate course, serving as a TA in an undergraduate course, or self-study by guided reading and discussion.

11.8 Teaching Requirements

The MSR program does not have any teaching requirements. However, all interested 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. The full university policy can be reviewed at: <https://www.cmu.edu/policies/faculty/evaluation-certification-english-fluency-instructors.html>

11.9 Research Requirements

Supervised research is conducted under supervision of a Robotics Institute faculty member. (This person may also be referred to as the research advisor or faculty advisor throughout this document). Supervised research consists of working on one of the research advisor's ongoing projects to develop a research thesis question, conduct the research, and create the material results that can give form to the MSR thesis. Supervised research is graded satisfactory/unsatisfactory, based on the advisor's assessment that the student has learned how to contribute to an original research project.

Those students who receive research assistantships (in the form of tuition or stipend) are expected to satisfy their supervised research requirement by registering for a minimum of 24 research units and working specifically on the project from which they receive their funding. A faculty research advisor may require a student to remain on campus and continue full-time research during both summer sessions.

Faculty Research Advisor

MSR students beginning in the fall semester must have a faculty advisor by October 31st; those beginning in the spring semester must have a faculty advisor by April 15th. Students must notify (via email with faculty research advisor included) the MSR Program Chair and Manager, Dimi Apostolopoulos and Barbara Fecich, of their mutually agreed-upon advisor-advisee relationship with a chosen faculty member. Note that the faculty must have a faculty appointment in the Robotics Institute, and that a faculty accepting the master's advisor relationship is never financially responsible for the master's student, except in the relatively rare cases when a research assistantship has been explicitly negotiated.

Research funding options

Research assistantships (RAs) are awarded to MSR students by research advisors based on availability and student performance. RA positions are provided by faculty projects which are funded by government agencies, private industries, and consortia.

RAs will be expected to conduct appropriate research under the direction and guidance of their research advisor. MSR students who receive an RA position are required to register for 24 units of 16-997. RA positions can cover tuition and/or a monthly stipend; they are not paid hourly.

RA positions are renewable on a semester or academic year basis. RA positions take into account the student's performance in course work, research and faculty's availability of funds. If support is through an external grant or contract, and this funding is lost, reduced, or changed, the advisor will notify the student accordingly. All efforts will be made to facilitate the student's continuation in their degree program if the student is progressing in an acceptable manner.

If a student receives an "N" grade for 16-997 they are ineligible for funding the following semester.

Health insurance and activities fees are always the responsibility of the MSR student.

GuSH Research Funding

GuSH Research Funding is a source of small research grant funds provided by the Graduate Student Assembly (GSA) and the Provost's Office and managed by the Office of Graduate and Postdoctoral Affairs. Students can find more information about the application process and deadlines at: <https://www.cmu.edu/graduate/professional-development/research-funding/index.html>

Resources and Regulations Governing Research at Carnegie Mellon

- Office of Sponsored Programs
<https://www.cmu.edu/osp/>
- Office of Research Integrity & Compliance
<https://www.cmu.edu/research-compliance/index.html>

- Intellectual Property Policy
<https://www.cmu.edu/policies/administrative-and-governance/intellectual-property.html>
- Policy on Restricted Research
<https://www.cmu.edu/policies/research/restricted-research.html>
- Human Subjects in Research Policy
<https://www.cmu.edu/policies/research/human-subjects-in-research.html>

11.10 Internship Option

Practicum (16-990) is a summer only course designed to provide MSR students with an opportunity for an internship experience to count towards the required 84 units of research. MSR students have the option to register for a maximum of 12 units in the summer after their first academic year. Students are not eligible for summer internship credit in their first or last semester.

MSR students must have their research advisor complete the MSR Summer Internship approval form and submit it to the MSR Program Chair and MSR Program Manager prior to the start of the summer term for final approval. The MSR Program Chair, Dimi Apostolopoulos has the final approval for all internships. The research advisor must confirm the content of the internship aligns with and contributes directly to the student's thesis research project. By providing their approval, the research advisor is committing to oversee the content of the internship, which culminates in a one-page report due to the Program Chair and Program Manager the day before summer grades are due.

16-990 does not incur tuition fees for MSR students. Students may not be enrolled in Practicum in addition to any other CMU course.

International students are required to consult with Office of International Education for eligibility before seeking an internship/co-op or signing an offer contract (required addition to ensure the university is in compliance with immigration laws for F & J status students).

11.11 Thesis Requirement

MS Thesis Committee

The student must form a master's committee by the end of their second semester, consisting of their research advisor(s), an additional RI faculty member, and a senior RI PhD student. If the student is co-advised, both research advisors must be on the committee in addition to another faculty member. The additional faculty member must be from Carnegie Mellon University and should be from a different research group or project than that of the student. The PhD student must have completed their second year of study or have successfully graduated from the Robotics Research Master's program. Replacement of a committee member may occur if the incoming committee member

confirms in writing their consent to join the committee. Changes to the MS committee cannot occur after the scheduling of the MSR student's thesis talk.

The student is expected to hold at least two research meetings with each member of the committee individually, discussing their research directions. Online forms are used (Speaking and Writing Qualifier forms, via the GS Audit site) by the committee members to report on and to approve the final thesis document and presentation. Committee approvals must be submitted by the grade deadline in the semester which the student wishes to graduate.

Thesis Talk

The student is expected to give an oral thesis presentation during standard working hours in a public venue at Carnegie Mellon. The student is expected to demonstrate the ability to present technical material to a technical audience that is not presumed to have specific expertise in the research area. The Master's Committee should be in attendance, but committee members may designate proxies to evaluate the presentation and fill out the Oral qualifying form.

The student must advertise their thesis talk to the RI community email distribution list a week in advance and send a reminder a day in advance of their talk. Failure to send the draft two weeks in advance or to advertise as dictated above will result in the student rescheduling their thesis talk to allow for proper policy adherence. The oral thesis presentation must occur on a weekday on or before the last day of classes in the semester the student intends to graduate.

Thesis Document

The student is also expected to deliver a master's thesis describing the supervised research. This should be a document for which the student is the sole or principal author. The thesis should demonstrate a style, organization, and clarity that enables researchers in the field to comprehend the problem, method, and results of the research.

The thesis must, at a minimum, contain the following sections and content: Background, Research Question, Related Work, Methods, Results, and Conclusions. There is not a specific page-based minimum length for the thesis document. Once approved, the thesis must be archived as a Carnegie Mellon Technical Report. The principal approval for the thesis document is provided by the student's committee, via the Writing Qualifier form.

The student is also expected to deliver a complete thesis draft document to every member of their committee and to the MSR program leadership two weeks (minimum of 10 business days) in advance of the oral presentation.

Research / Thesis Expectation and Successful Completion Requirements

In both the presentation and document, the student should convey a mastery of a topic related to contemporary robotics research. The student should present a summary of work related to the topic

from the current research literature and should clearly describe how their research fits into the context of that research. It is not necessary for the student to generate their own novel research results that go beyond the current state of art, but, of course, novel results are welcome and will strengthen the presentation and document.

All thesis requirements, including upload and qualifier forms, must be received by the date and time that grades are due for certification in that semester.

Unsuccessful Thesis (Written and/or Oral)

If the MS Committee does not indicate the student passed their written or oral thesis requirements, via the completion (or failure of submission) of the MSR speaking and writing qualifier forms, the student will not graduate that semester. The MSR student must register for a minimum of 5 units of 16-997 in the semester they wish to graduate, which must fall within the MS Student statue of limitations. The thesis talk and document process must be followed again in the semester that the student wishes to graduate. Multiple attempts in the same semester are allowable. There is no limit to the number of attempts an MSR student can make provided they are within the statue of limitations for the degree.

11.12 Requirements for entry into Ph.D. program

MSR students are eligible to apply for the Robotics Institute PhD program in the same way all other PhD applicants are reviewed.

11.13 Certification of Degree

Certification of the Master of Science in Robotics degree will occur in the semester the MSR student successfully completes the requirements below:

- Completion of all required coursework (minimum of 84 units)
- Completion of thesis talk components
 - o Four-Six Weeks Prior to thesis talk – MSR student must identify a mutually agreed upon time (one and a half hours) with all of their committee members. The student must work with the MSR Program Manager, Barbara (B.J.) Fecich, to reserve an appropriately sized (capacity of 35 or larger) room for two hours to allow a half hour for set up, an hour for the talk, and a half hour for questions and wrap-up.
 - o Advertisement of talk to the RI Community one week (minimum of five business days) in advance via ri-people@andrew.cmu.edu distribution list
 - o Reminder advertisement sent (same format and population as above) 24-36 hours prior to thesis talk.

- Talk occurs on or before the **last day of classes** (not finals) in the semester the student wishes to graduate and meets all other requirements outlined in this document. The student should consult with the MSR Program Manager Barbara (B.J.) Fecich on what those dates are.
- Speaking qualifier forms with a passing decision from each member on the thesis committee submitted via GS Audit or by the date and time that grades are due for the semester in which the student is graduating.
- Completion of thesis document requirements
 - Document submitted to all members of MS thesis committee, MSR Program Chair Dimi Apostolopoulos, and MSR Program Manager Barbara (B.J.) Fecich two weeks in advance of thesis talk. Minimum of 10 business days.
 - Upload of thesis as a MS Thesis / Tech Report on the RI website prior to the day and time that grades are due in the semester in which the student is graduating. (Technical report number is required and may be obtained from Victor Valle.)
 - Writing qualifier forms with a passing decision from each member on the thesis committee submitted via GS Audit or emailed to MSR Program Manager, Barbara (B.J.) Fecich by the date and time that grades are due for the semester in which the student is graduating.
- Completion of the MSR Post-Graduation Survey: <https://www.surveymonkey.com/r/17MSRExit> , by the date and time that grades are due for the semester in which the student is graduating.

MSR Program Manager, Barbara (B.J.) Fecich, will certify the student via CMU's SIO system and email the student confirmation of their certification status.

11.14 Leave of Absence

Students who wish to leave the program temporarily may request a leave of absence by submitting a request to the MSR Program Manager Barbara (B.J.) Fecich. The entire process for taking a leave and returning from a leave can be found at: <https://www.cmu.edu/hub/registrar/leaves-and-withdrawals/>.

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. Students not in good standing will have conditions for return determined by the Program Chair in consultation with the advisor.

Students on leave of absence should contact the 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).

11.15 Withdrawal of Degree

University Policy for withdrawal of degree:

<https://www.cmu.edu/policies/student-and-student-life/withdrawal-of-a-degree.html>

11.16 Advising

1. MSR Program Chair Prof Dimi Apostolopoulos

Available to assist students with degree completion questions. Approves electives, course audits, any variant from MSR program policy. Determines if any academic action needs to take place. Sounding board for technical application of degree, student's future plans, course content, campus resource identification, etc.

2. MSR Program Manager Barbara (B.J.) Fecich

Confirms student and program compliance with the University. Signs on behalf of Dimi Apostolopoulos for all CMU forms and anything that requires an academic advisor signature. Listed as student's academic advisor in S3/SIO. Helps students with any non-technical component of degree completion, which includes, but is not limited to: resource/room scheduling, course registration, maintenance of student's file in SIO/S3/ Stellic and GS Audit, campus resource identification, sounding board for any and all student questions, etc.

3. Research Advisor(s)

Provide guidance on research direction, thesis topic, research development. Approve written thesis document and oral presentation.

11.17 Graduate Student Conflicts, Appeals and Grievance Procedures

Graduate students who feel the need to address an academic concern should start with the program representatives and escalate as necessary.

Program Level

MSR Program Chair, Dimi Apostolopoulos

MSR Program Manager, Barbara (B.J.) Fecich

Department Level

Associate Director of Education, George Kantor

Institute Director, Matthew Johnson-Roberson

College Level

Associate Dean of Master's Programs, David Garlan

Dean of the School of Computer Science, Martial Hebert

University Level

Graduate students are expected to seek informal resolution of all concerns within the department, unit or program before invoking formal processes. When an informal resolution cannot be reached, a graduate student who seeks further review of the matter should follow the procedures outlined below. These procedures apply to students in all graduate programs of the University.

Summary of Graduate Student Appeal and Grievance Procedures:

<https://www.cmu.edu/graduate/policies/appeal-grievance-procedures.html>

12 Grading and Evaluation

12.1 MSR Policy on Grades for Retaking a Course

The MSR program only factors the seven courses that are counting towards the MSR degree into the MSR QPA. Any additional coursework or repeated coursework will not be counted in the final MSR QPA.

12.2 Department Policy on pass/fail, satisfactory/unsatisfactory

A letter grade of a B- or better is required for all MSR core and elective coursework. Pass/fail courses cannot count towards any MSR requirement. Students register for a blanket course (e.g., 16-997-“Reading and Research”) covering all their program activities for that semester, for which they receive a satisfactory / unsatisfactory grade.

12.3 Independent Study/Directed Reading

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 a specialized educational and research experience.

Any faculty member in the Robotics Institute is eligible to serve as the supervisor of an Independent Study project. The student must complete the Independent Study Request form, which includes a brief prospectus of the project to the faculty supervisor as a basis for reaching agreement on the objectives of the study. The Independent Study Request Form will be reviewed by the MSR Program Chair for final approval.

Independent studies may only be requested during the normal course add period for any given semester.

12.4 University Policy on Grades

<https://www.cmu.edu/policies/student-and-student-life/grading.html>

This policy document details university grading principles for students taking courses and covers the specifics of assigning and changing grades, grading options, drop/withdrawals and course repeats. It also defines the undergraduate and graduate grading standards.

12.5 Process for Appealing Final Grades

<https://www.cmu.edu/student-affairs/theword/academic/appeal-of-grades-and-academic-actions.html>

Final grades will be changed only in exceptional circumstances and only with the approval of the instructor and the department, unit or program. Grading is a matter of sound discretion of the instructor and final grades are rarely changed without the consent of the instructor who assigned the grade. The following circumstances are the unusual exceptions that may warrant a grade appeal: (a) the final grade assigned for a course is based on manifest error (e.g. a clear error such as arithmetic error in computing a grade or failure to grade one of the answers on an exam), or (b) the faculty or staff member who assigned the grade did so in violation of a University policy.

12.6 Policy on Grades for Transfer Courses

<https://www.cmu.edu/policies/student-and-student-life/transfer-credit-evaluation-and-assignment.html>

Carnegie Mellon University offers students the opportunity to take courses for credit through a cross-registration program (see Pittsburgh Council on Higher Education (PCHE) and Cross-registration below) and through the receipt of transfer credit from other accredited institutions. The Carnegie Mellon University transcript will include information on such courses as follows: Carnegie Mellon courses and courses taken through the university's cross-registration program will have grades recorded on the transcript and be factored into the QPA. All other courses will be recorded on this transcript indicating where the course was taken, but without grade. Such courses will not be taken into account for academic actions, honors or QPA calculations.

Note: Suspended students may take courses elsewhere; however, they may receive transfer credit only if their college's and department's policies allow this.

12.7 GPA Requirements and QPA Requirements for Graduation

All seven courses counting towards the MS in Robotics degree must be passed with a grade of B- or better. 84 units of 16-997 (include 16-990 if applicable) must be passed with a grade of satisfactory.

A grade point average of a 3.3 or higher in coursework fulfilling any MSR requirement is required to graduate.

12.8 Satisfactory Academic Standing and Academic Actions

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 course of 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 in the midst of a semester. The Department Head's determination may be appealed (see "Appeals and Grievances"). 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. dismissal from program/department/college.

12.9 Academic Integrity

<https://www.cmu.edu/policies/student-and-student-life/academic-integrity.html>

Students are responsible for understanding CMU's academic integrity policies. The Office of Community Standards and Integrity (ocsi@andrew.cmu.edu) is available if you have any questions.

Faculty outcomes are limited to course level action.

MSR and Robotics Institute outcomes will be provided to the student per the "Satisfactory Academic Standing and Academic Actions" policy included in this handbook.

12.10 Regular Reviews and Evaluations by Department

Satisfactory progress in coursework will be assessed by the student keeping up with the course schedule and passing courses.

The faculty research advisor will assign a satisfactory/ unsatisfactory grade every semester for the supervised research.

Review of students' grades will take place at the conclusion of each semester by the MSR Program Chair and MSR Program Manager. Academic actions will be provided to those impacted prior to the start of the next academic semester.

Satisfactory progress in the MSR program is defined as a student passing one or two academic courses with a grade of a B- or better and receiving a satisfactory review from their research advisor for 16-997. If the student has completed all academic courses, satisfactory progress is a satisfactory review from their research advisor for a minimum of 36 units of 16-997.

13 Safeguarding Educational Equity

13.1 Assistance for Individuals with Disabilities

<http://www.cmu.edu/education-office/disability-resources/>

The Office of Disability Resources at Carnegie Mellon University has a continued mission to provide physical, digital, and programmatic access to ensure that students with disabilities have equal access to their educational experience. We work to ensure that qualified individuals receive reasonable accommodations as guaranteed by the Americans with Disabilities Act (ADA) and Section 504 of the Rehabilitation Act of 1973. Students who would like to receive accommodations can begin the process through Disability Resources' secure online portal:

<https://rainier.accessiblelearning.com/cmu/> or email access@andrew.cmu.edu to begin the interactive accommodation process.

Students with physical, sensory, cognitive, or emotional disabilities are encouraged to self-identify with the Office of Disability Resources and request needed accommodations. Any questions about the process can be directed to access@andrew.cmu.edu, or call (412) 268-6121.

13.2 Sexual Misconduct Policy

The University prohibits sex-based discrimination, sexual harassment, sexual assault, dating/ domestic violence, sexual exploitation, stalking and violation of protective measures. The University also prohibits retaliation against individuals who bring forward such concerns or allegations in good faith.

The University's Sexual Misconduct Policy is available at:

<https://www.cmu.edu/policies/administrative-and-governance/sexual-misconduct/index.html>

The University's Policy Against Retaliation is available at:

<https://www.cmu.edu/policies/administrative-and-governance/whistleblower.html>

If you have been impacted by any of these issues, you are encouraged to make contact with any of the following resources:

Office for Institutional Equity and Title IX

<http://www.cmu.edu/title-ix/>

412-268-7125

institutionalequity@cmu.edu

University Police

<https://www.cmu.edu/police/>

412-268-2323

Additional resources and information can be found at:

<https://www.cmu.edu/title-ix/resources-and-information/index.html>

13.3 Gestational and Parental Accommodations

<https://www.cmu.edu/graduate/programs-services/maternity-accommodation-protocol.html>

Providing holistic student support is a top priority at Carnegie Mellon. The protocols on this page are designed to support the parental needs of students and their families.

Students seeking any of the Parental Accommodations described below must register with the Office of the Dean of Students by contacting the office for an appointment by calling 412-268-2075.

Students are encouraged to register with the Office of the Dean of Students ninety (90) days in advance of the anticipated arrival of the child as applicable in individual circumstances. At the time of registering, students will have the opportunity to consult about resources, procedures, funding options and preparation for discussing academic accommodations with the student's academic department. Students should also consult with their academic advisors either before or in conjunction with registering with the Office of the Dean of Students.

Accommodations for Gestational Parents

The birth of a child is a significant life event that may require time away from academic pursuits for delivery and recovery from delivery of a newly born child. Students whose anticipated delivery date is during the course of a semester may need to take time away from their academic responsibilities. Carnegie Mellon students seeking time away are afforded two options as possible accommodation:

- **Short-Term Accommodation for Gestational Parents** – A short term absence from academic responsibilities up to a maximum of six (6) weeks. Short-Term Accommodation may be extended by two (2) weeks, for a total of eight (8) weeks, when a longer absence is medically necessary. Prior to the absence students must work with relevant university faculty and staff to adjust their course work, research, teaching and other academic responsibilities during the period of absence. This may include extensions of time to complete assignments, incomplete grades, and/or dropping courses, shifting research responsibilities and adjusting TA assignments. Students who take a Short-Term Accommodation will remain enrolled.
- **Formal Leave of Absence**– A formal leave of absence under the Student Leave Policy. Generally, the Student Leave Policy permits students to take a leave of absence for a full-semester, mini-semester, or for the time remaining in the semester during which the leave is taken. Students who take a Formal Leave of Absence (<https://www.cmu.edu/policies/student-and-student-life/student-leave.html>) drop all remaining courses for the semester and are unenrolled for the semester. International students must consult with the Office of International Education (<https://www.cmu.edu/oie/>) before considering this option due to visa implications.

Financial Assistance for Student Parents

Carnegie Mellon also offers the following options for financial assistance to students who become parents while enrolled:

Interest Free Loan – Any student who becomes a parent is eligible to apply for an interest-free parental loan (<https://www.cmu.edu/student-affairs/dean/loans/>) from the Office of the Dean of Students.

13.4 Consensual Intimate Relationship Policy Regarding Undergraduate Students

<https://www.cmu.edu/policies/student-and-student-life/consensual-relationships.html>

This policy addresses the circumstances in which romantic, sexual or amorous relationships /interactions with undergraduate students, even if consensual, are inappropriate and prohibited. The purpose of this policy is to assure healthy professional relationships. This policy is not intended to discourage consensual intimate relationships unless there is a conflicting professional relationship in which one party has authority over the other as in the policy.

14 Additional Department and University Policies and Protocols

14.1 Verification of Enrollment

Enrollment Services is the **only** University office that can provide an official letter of enrollment, official transcript, and enrollment verification. Departments are not allowed to provide this information on behalf of a student. Enrollment verification can be requested online through The HUB at: <https://www.cmu.edu/hub/registrar/student-records/verifications/enrollment.html>

14.2 Change of Address

Departments are asked to encourage students to keep their current local address up-to-date in SIO. This supports a university initiative to have accurate living information for students for official program/department/college/university notices, the ability to facilitate wellness checks, ensure international students are in compliance with visa requirements, etc.

14.3 New Policies / “Grandfather” Policy

When policies are changed, students currently enrolled whose degree program is affected by a change in policy will continue to be governed by the older policies (MSR 2022 Handbook or earlier) that were in place at the time of their matriculation. A switch in governing policies will result in the student being held accountable to all policies under the new handbook.

MSR students currently enrolled in the MSR program before Fall 2023 may elect to switch to the newer policies (MSR 2023 Handbook).

14.4 Time Away from Academic Responsibilities

Students with graduate assistantships are expected to continue with their research during academic breaks (including the summer months) except for the official university holidays. A complete list of the official university holidays can be found at the Human Resources website.

Due to federal regulations governing graduate student support, paid time off for personal business and vacations is not provided. A supported graduate student wanting to take a one-week break during one of the summer months in which they are receiving a stipend is expected to get approval for that break with their advisor and make up the work during the other three weeks of that month. Supported graduate students wishing to take longer periods of personal time off must do so without pay and must receive advance approval from their research advisor a minimum of four weeks prior to the requested time off. The advisor must then notify the Graduate Program Administrator and Business Manager of this approval so that stipend

adjustments can be processed.

Official University Holidays:

New Year's Day (Jan 1) Martin Luther King, Jr. Day Memorial Day

Juneteenth (June 19) Independence Day (July 4) Labor Day

Thanksgiving Day Day after Thanksgiving Day before Christmas (Dec 24)

Christmas Day (Dec 25) Day before New Year's Day (Dec 31)

14.5 Employment Eligibility Verification

If you are receiving a stipend, are a TA, or are planning to have a position with CMU, then Employment Eligibility Verification is required. Form I-9 must be completed within 3 business days of beginning work for any type of compensation (stipend or employment). Additional details are highlighted below. To ensure compliance with federal law, Carnegie Mellon University maintains the **Employment Eligibility Verification (I-9) Policy [pdf]** covering the university's I-9 and E-Verify requirements:

- Every individual receiving a stipend from CMU or employed by CMU must comply with the I-9 Policy by completing the Form I-9 within three business days following the first day of stipend start date/employment.
- Individuals who expect to work on a federally funded project are further responsible for submitting an E-Verify Processing Request Form to the Office of Human Resources if required.
- For more information, please see CMU's **Guidance for Completing the Form I-9 and E-Verify Requirements at CMU [pdf]** or visit the Human Resources Service website to learn more about Form I-9 and E-Verify and to schedule an appointment to complete the Form I-9.
- Students who fail to complete the Form I-9 in a timely manner may have stipend payments suspended. If employed by the university, an individual who fails to timely complete the Form I-9 may be subject to disciplinary action up to and including termination of employment.

15 Financial Support

15.1 Internal Funding Opportunities through Carnegie Mellon

CMU University Financial Aid Office: <https://www.cmu.edu/sfs/financialaid/graduate/index.html>

Teaching Assistantships

Teaching Assistantships (TAs) are provided to faculty members for courses that meet the departmental requirements. Faculty then offer these positions to selected students. Teaching assistant duties include, but are not limited to, holding office hours, conducting recitation classes, and grading. There are minimum English proficiency requirements that must be met in order for a student to accept a teaching assistantship. Pennsylvania state law requires that all students who are not native speakers of English take and pass a state administered proficiency test. Support for teaching activities can be found through the Eberly Center for Teaching Excellence. Students who will be TAs for the department are encouraged to visit the Teaching Center and to take advantage of the information and services located there.

Emergency Loans

The Office of the Dean of Student Affairs offers short-term emergency loans for supplies, medication, food or other unexpected circumstances. The loans are interest-free and for short periods of time (not longer than a month).

15.2 External Funding Opportunities

U.S. Department of Education Resources

- U.S. citizens and permanent residents may complete the Free Application for Federal Student Aid (FAFSA) online at <https://studentaid.gov/h/apply-for-aid/fafsa>.
- Students may obtain information regarding their loans through the William D. Ford Direct Loan Program, including deferment forms and payment information at <http://www.dlsonline.com/index.asp>.
- Information about the federal student aid programs may be found at <https://studentaid.gov/>.

Fellowships and Grants

- National Science Foundation: <https://beta.nsf.gov/funding/opportunities/nsf-graduate-research-fellowship-program-grfp>
- Fellowship resources compiled by the National Association of Fellowship Advisors: <http://www.nafadvisors.org/scholarships.htm>

Outside Employment

Students are not allowed to be employed outside of the university during the academic year nor during the summer if they are being supported by the department.

15.3 Loans

Students who hold American citizenship or who are permanent residents of the United States may submit the Free Application for Federal Student Aid (FAFSA, above) so that the Office of Financial Aid may determine their eligibility for loans through the William D. Ford Direct Stafford Loan Program. International students with a credit worthy US cosigner may apply for private educational loans through Citibank's Citiassist Loan Program.

Grad PLUS

Effective July 1, 2006, a graduate or professional student may be eligible to borrow a Federal Graduate PLUS Loan. This loan allows you, not your parents, to borrow up to the cost of attendance less any other financial aid you receive. It has a fixed interest rate of 8.5% and no aggregate limits. You must be a U.S. citizen or permanent resident to qualify. Credit checks are also required to determine eligibility, but the credit criteria are much less stringent than for most private alternative loans. If you don't meet the credit criteria, you may still obtain the loan with an "endorser" who does meet the credit requirements. PLUS applicants cannot have adverse credit based on a review of at least one credit report from a national credit reporting agency. Adverse credit is defined as:

- No Federal Student Aid loans in default or delinquent status
- No accounts that are 90 days or more past due or in collection
- No evidence of default, foreclosure, tax lien, repossession, wage garnishment, or judgments in the last 5 years
- No accounts that were "write-offs" or never able to collect upon

A lack of credit history or insufficient credit history is not considered adverse credit.

Creditworthiness is not based on a FICO score, debt to income ratio, or annual salary. You must have completed a FAFSA and have applied for your annual loan maximum eligibility under the Stafford program first. You will also have to complete a Master Promissory Note (MPN) and Addendum for this loan.

If you decide to apply for the GRAD PLUS loan, log into <http://www.asa.org> and follow the instructions for applying for the GRAD PLUS loan. Be sure to complete your Master Promissory Note. A drop-down list of our preferred lenders will pop up for your convenience. Preferred lenders have been chosen because of the benefits that they offer our students and in addition, will not charge the 1% default fee mentioned in the attached comparison chart. If you choose to

go with an outside lender, please keep in mind that there is a possibility that you may be charged a 1% default fee.

15.4 Other Resources

The following websites are available for researching other sources of financial aid. Please be sure to pay close attention to the stated application deadlines.

Note: links throughout the rest of this section have not been verified or updated. Graduate Students who need additional funds beyond the financial aid package offered by SAIS have the option to borrow funds through a private lender. These loans are credit based, so applicants may need a cosigner. International students may utilize private lenders if they have a US citizen or permanent resident as a cosigner.

www.finaid.com www.collegeinfo.org www.fastweb.com www.SALLIEMAE.COM
www.MACH25.com www.Fastaid.com www.Wiredscholar.com

College Board Scholarship Search

Fellowship Resources Compiled by the Soros Fellowship: <http://www.pdsoros.org/links.html>

National Association of Fellowship Advisors: <http://www.nafadvisors.org/scholarships.htm>

15.5 Sources of Financial Aid for International Students

The following information is designed to help international students in the search for additional sources of financial aid for attendance at the RI. This list includes a fellowship program from the Institute of International Education, several loan programs, and relevant websites and online sources of information.

Institute of International Education (IIE)

The IIE is a nonprofit organization that promotes international education. They provide information about the Fulbright Program on their website: www.iie.org. The number and amount of grants differs from country to country. They also publish several useful guides, including Funding for US Study: A guide for Foreign Nationals, English Language Orientation Programs (a guide to ESL programs in the US), and Academic Year Abroad. Books can be ordered through e-mail to iie-books@iie.org. You may also write to: Institute of International Education (IIE), 809 United Nations Plaza, New York, NY 10017-3580.

Ford Foundation International Fellowship Program (IFP)

The Foundation sponsors three minority graduate fellowship programs – predoctoral, doctoral, and postdoctoral – through the National Research Council. For information write or call the: National Research Council, 2101 Constitution Avenue, Washington, DC 20418. Or phone: (202)

334-2872

The IFP provides support for up to three years of formal graduate-level study. Fellows will be selected from countries in Africa and the Middle East, Asia, Latin America, and Russia where the foundation maintains active overseas programs. U.S. nationals are not eligible, although fellows may study in the United States. IFP Fellows must be nationals of eligible countries.

Please refer to the following website for more detailed information concerning the application process, eligible candidates, and IFP requirements: www.fordfound.org

Additional International Student Funding Resources

International students may find the information on the websites below helpful in researching funding sources: www.internationalscholarships.com www.educationusa.state.gov

Native Leadership Scholarship (women only):

<http://www.onsf.uconn.edu/find-scholarships/opportunities-for-non-us-citizens/>

Appendix A
2023-2024
Highlighted University Resources for Graduate Students

Note: The following pages are meant to broadly include only some of the resources available to graduate students. It is not an exhaustive appendix of resources, and students are strongly encouraged to visit the various websites linked below for the most up-to-date information.

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16 Key Resources for Graduate Student Support

16.1 Office of Graduate and Postdoctoral Affairs

<https://www.cmu.edu/graduate>

graded@cmu.edu

The Office of Graduate and Postdoctoral Affairs provides university-wide support for all graduate students and academic programs, with a focus on supporting graduate student success at Carnegie Mellon. Examples of resources offered through the Office of Graduate and Postdoctoral Affairs include, but are not limited to:

- Website with university resources, contact information for CMU programs and services, possible financial assistance and potential funding opportunities, and various procedural and policy information
- Newsletter to all graduate students with information on activities, resources, and opportunities
- Professional development seminars and workshops, and various programming and events for the graduate student community

The Office of Graduate and Postdoctoral Affairs also works directly with the colleges and departments on issues related to graduate students and serve as a resource for developing policy and procedures. The Office of Graduate and Postdoctoral Affairs partners with many other offices and organizations, such as the Graduate Student Assembly, to support the holistic graduate student educational experience.

16.2 Office of the Dean of Students

<https://www.cmu.edu/student-affairs/dean/>

The Office of the Dean of Students provides central leadership of the metacurricular experience at Carnegie Mellon including the coordination of student support. Graduate students will find the enrollment information for Domestic Partner Registration and Parental Accommodations in the Office of the Dean of Students or on their website. This Office also manages the Student Emergency Support Funding process. There are currently three forms of support funding for enrolled students: emergency student loans, student parental loans, and the Tartan Emergency Support Fund. Inquiring students

will be provided with additional information about the various types of funding during a consultation meeting with a member of the Dean of Students team. Tuition costs are not eligible for Student Emergency Support funding.

College Liaisons and the Student Support Resources team serve as additional resources for graduate students. College Liaisons are senior members of the Division of Student Affairs who work with departments and colleges addressing student concerns across a wide range of issues. College Liaisons are identified on the Important Contacts list in Student Information Online (SIO). The Student Support Resources team offers an additional level of support for students who are navigating a wide range of life events. Student Support Resources staff members work in partnership with campus and community resources to provide coordination of care and support appropriate to each student's situation.

16.3 The Division of Student Affairs

The Division of Student Affairs includes (not an exhaustive list):

- Athletics, Physical Education and Recreation
- Career and Professional Development Center (CPDC)
- Center for Student Diversity and Inclusion
- Cohon University Center
- Counseling & Psychological Services (CaPS)
- Dining Services
- Office of Community Standards and Integrity (OCSI)
- Office of Student Leadership, Involvement, and Civic Engagement (SLICE)
- University Health Services (UHS)
- Wellness Initiatives

16.4 Center for Student Diversity & Inclusion

<https://www.cmu.edu/student-diversity/>

Diversity and inclusion have a singular place among the values of Carnegie Mellon University. The Center for Student Diversity & Inclusion actively cultivates a strong, diverse and inclusive community capable of living out these

values and advancing research, creativity, learning and development that changes the world.

The Center offers resources to enhance an inclusive and transformative student experience in dimensions such as access, success, campus climate and intergroup dialogue. Additionally, the Center supports and connects historically underrepresented students and those who are first in their family to attend college in a setting where students' differences and talents are appreciated and reinforced, both at the graduate and undergraduate level.

Initiatives coordinated by the Center include, but are not limited to:

- First generation/first in family to attend college programs
- LGBTQ+ Initiatives
- Race and ethnically focused programs, including Inter-University Graduate Students of Color Series (SOC) and PhD SOC Network
- Women's empowerment programs, including Graduate Women's Gatherings (GWGs)

16.5 Assistance for Individuals with Disabilities

<https://www.cmu.edu/disability-resources/>

The Office of Disability Resources at Carnegie Mellon University has a continued mission to provide physical, digital, and programmatic access to ensure that students with disabilities have equal access to their educational experience. The Office works to ensure that qualified individuals receive reasonable accommodations as guaranteed by the Americans with Disabilities Act (ADA) and Section 504 of the Rehabilitation Act of 1973. Students who would like to receive accommodations can begin the process through Disability Resources' secure online portal or email access@andrew.cmu.edu to begin the interactive accommodation Process.

Students with physical, sensory, cognitive, or emotional disabilities are encouraged to self-identify with the Office of Disability Resources and request needed accommodations. Any questions about the process can be directed to access@andrew.cmu.edu, or call (412) 268- 6121.

16.6 Eberly Center for Teaching Excellence & Educational Innovation

<https://www.cmu.edu/teaching/>

The Eberly Center offers a wide variety of confidential, consultation services

and professional development programs to support graduate students as teaching assistants or instructors of record during their time at Carnegie Mellon University and as future faculty members at other institutions. Regardless of one's current or future teaching context and duties, Eberly's goal is to disseminate evidence-based teaching strategies in ways that are accessible and actionable. Programs and services include campus-wide Graduate Student Instructor Orientation events and our Future Faculty Program, both of which are designed to help participants be effective and efficient in their teaching roles. The Eberly Center also assists departments in creating and conducting customized programs to meet the specific needs of their graduate student instructors. Specific information about Eberly Center support for graduate students is found at:

<https://www.cmu.edu/teaching/graduatestudentsupport/>

16.7 Graduate Student Assembly

<https://www.cmu.edu/stugov/gsa/>

The Graduate Student Assembly (GSA) is the branch of Carnegie Mellon Student Government that represents and advocates for the diverse interests of all graduate students at CMU. GSA is composed of representatives from the different graduate programs and departments who want to improve the graduate student experience at the different levels of the university. GSA is funded by the Student Activities Fee from all graduate students. GSA passes legislation, allocates student activities funding, advocates for legislative action locally and in Washington D.C. on behalf of graduate student issues and needs, and otherwise acts on behalf of all graduate student interests. GSA's recent accomplishments are a testament to their making a difference, and steps to implementing the vision laid out by the strategic plan.

<https://www.cmu.edu/stugov/gsa/about-the-gsa/strategic-plan.html>

GSA offers an expanding suite of social programming on and off-campus to bring graduate students from different departments together and build a sense of community. GSA is the host of the Graduate Student Lounge on the 3rd floor of the Cohon University Center. GSA also maintains a website of graduate student resources on and off-campus. GSA continues to rely on student feedback to improve the graduate student experience at CMU. Feel free to contact them at gsa@cmu.edu to get involved, stop by their office in the Cohon University Center Room 304 or become a representative for your department.

16.8 Office of International Education (OIE)

<https://www.cmu.edu/oie/>

Carnegie Mellon hosts international graduate and undergraduate students who come from more than 90 countries. The Office of International Education (OIE) is the liaison to the University for all non-immigrant students and scholars, as well the repository for study abroad opportunities. OIE provides many services including: advising on personal, immigration, study abroad, academic, and social and acculturation issues; presenting programs of interest such as international career workshops, tax workshops, and cross-cultural and immigration workshops; international education and statistics on international students in the United States; posting pertinent information to students through email and the OIE website and conducting orientation and pre-departure programs.

16.9 Veterans and Military Community

<https://www.cmu.edu/veterans/>

Military veterans are a vital part of the Carnegie Mellon University community. Graduate students can find information on applying for veteran education benefits, campus services, veteran's groups at CMU, and non-educational resources through the Veterans and Military Community website. There are also links and connections to veteran resource in the Pittsburgh community. The ROTC and Veteran Affairs Coordinator can be reached at urovaedbenefits@andrew.cmu.edu or 412-268-8747.

16.10 Carnegie Mellon Ethics Hotline

<https://www.cmu.edu/hr/resources/ethics-hotline.html>

The health, safety and well-being of the university community are top priorities at Carnegie Mellon University. CMU provides a hotline that all members of the university community should use to confidentially report suspected unethical activity, violations of university policy, or violations of law. Students, faculty and staff can anonymously file a report by calling 1-844-587-0793 or visiting <https://cmu.ethicspoint.com/>. All submissions are reported to appropriate university personnel and handled discreetly.

The hotline is NOT an emergency service. For emergencies, call University Police at 412-268-2323.

16.11 Policy Against Retaliation

It is the policy of Carnegie Mellon University to protect from retaliation any individual who makes a good faith report of a suspected violation of any applicable law or regulation, university Policy or procedure, any contractual obligation of the university, and any report made pursuant to the Carnegie Mellon University Code of Business Ethics and Conduct.

Additional details regarding the Policy Against Retaliation are available at:

<https://www.cmu.edu/policies/administrative-and-governance/whistleblower.html>

17 Key Offices for Academic & Research Support

17.1 Computing and Information Resources

<https://www.cmu.edu/computing/>

Computing Services maintains and supports computing resources for the campus community, including the campus wired and wireless networks, printing, computer labs, file storage, email and software catalog. As members of this community, we are all responsible for the security of these shared resources. Be sure to review the Safe Computing

(<https://www.cmu.edu/computing/safe/>) section and the University Computing Policy

(<https://www.cmu.edu/policies/information-technology/computing.html>)

Visit the Computing Services website (<https://www.cmu.edu/computing/>) to learn more. For assistance the Computing Services Help Center is available at 412-268-4357 (HELP) or ithelp@cmu.edu.

17.2 Student Academic Success Center

<https://www.cmu.edu/student-success/>

The Student Academic Success Center's (SASC) work to support success focuses on creating spaces for students to engage in their coursework and approach to learning through many group and individual program options. SASC supports student success by providing academic coaching, subject-specific tutoring, effective communication strategies, accommodations for students with disabilities, and language support for multilingual learners. SASC engages with faculty and staff to improve the coordination and professional development for academic advisors. Visit the SASC website for more information about

services offered in areas such as communication and language support; language and cross-cultural support; and learning support.

17.3 University Libraries

<https://www.library.cmu.edu/>

The University Libraries offers a wide range of information, resources, and services supporting graduate students in coursework, research, teaching, and publishing. The library licenses and purchases books, journals, media, and other needed materials in various formats. Library liaisons, consultants, and information specialists provide in-depth and professional assistance and advice in all-things information, including:

- Locating and obtaining specific resources
- Providing specialized research support
- Advanced training in the use and management of data

Sign up for workshops and hands-on topic-specific sessions such as data visualization with Tableau, cleaning data with OpenRefine, and getting started with Zotero. Weekly drop-in hours for Digital Humanities and for Research Data Research Management are scheduled during the academic year. Start at the library home page to find the books, journals, and databases you need; to identify and reach out to the library liaison in your field; to sign up for scheduled workshops; and to connect with consultants in scholarly publishing, research data management, and digital humanities.

17.4 Research at CMU

<https://www.cmu.edu/research/>

The primary purpose of research at the university is the advancement of knowledge in all fields in which the university is active. Research is regarded as one of the university's major contributions to society and as an essential element in education, particularly at the graduate level and in faculty development. Research activities are governed by several university policies. Guidance and more general information are found by visiting the Research at Carnegie Mellon website.

17.5 Office of Research Integrity & Compliance

<https://www.cmu.edu/research-compliance/>

The Office of Research Integrity & Compliance (ORIC) is designed to support research at Carnegie Mellon University. The staff work with researchers to ensure research is conducted with integrity and in accordance with federal and Pennsylvania regulation. ORIC assists researchers with human subject research, conflicts of interest, responsible conduct of research, export controls, and institutional animal care & use. ORIC also provides consultation, advice, and review of allegations of research misconduct.

18 Key Offices for Health, Wellness & Safety

18.1 Counseling & Psychological Services

<https://www.cmu.edu/counseling/>

Counseling & Psychological Services (CaPS) affords the opportunity for students to talk privately about academic and personal concerns in a safe, confidential setting. An initial consultation at CaPS can help clarify the nature of the concern, provide immediate support, and explore further options if needed. These may include a referral for counseling within CaPS, to another resource at Carnegie Mellon, or to another resource within the larger Pittsburgh community. CaPS also provides workshops and group sessions on mental health related topics specifically for graduate students on campus. CaPS services are provided at no cost. Appointments can be made in person, or by telephone at 412-268-2922.

18.2 Health Services

<https://www.cmu.edu/HealthServices/>

University Health Services (UHS) is staffed by physicians, advanced practice clinicians and registered nurses who provide general medical care, allergy injections, first aid, gynecological care, and contraception as well as on-site pharmaceuticals. The CMU Student Insurance Plan covers most visit fees to see the physicians and advanced practice clinicians & nurse visits. Fees for prescription medications, laboratory tests, diagnostic procedures and referral to the emergency room or specialists are the student's responsibility and students should review the UHS website and their insurance plan for detailed information about the university health insurance requirement and fees.

UHS also has a registered dietician and health promotion specialists on staff to assist students in addressing nutrition, drug and alcohol and other healthy

lifestyle issues. In addition to providing direct health care, UHS administers the Student Health Insurance Program. The Student Health Insurance plan offers a high level of coverage in a wide network of health care providers and hospitals. Appointments can be made by visiting UHS's website, walk-in, or by telephone, 412-268-2157.

18.3 Campus Wellness

<https://www.cmu.edu/wellness/>

At Carnegie Mellon, we believe our individual and collective well-being is rooted in healthy connections to each other and to campus resources. The university provides a wide variety of wellness, mindfulness and connectedness initiatives and resources designed to help students thrive inside and outside the classroom.

18.4 Religious and Spiritual Life Initiatives (RSLI)

<https://www.cmu.edu/wellbeing/resources/religious-spiritual/index.html>

Carnegie Mellon is committed to the holistic growth of our students, including creating opportunities for spiritual and religious practice and exploration. RSLI has relationships with local houses of worship from various traditions and many of these groups are members of CMU's Council of Religious Advisors. They also offer programs and initiatives that cross traditional religious boundaries in order to increase knowledge of and appreciation for the full diversity of the worldview traditions. RSLI staff are available to support students across the spectrum of religious and spiritual practice and would be more than happy to help you make a connection into a community of faith during your time at CMU.

18.5 University Police

<https://www.cmu.edu/police/>

x2323

The University Police Department is located at 4551 Filmore Street. The department's services include police patrols and call response, criminal investigations, fixed officer and foot officer patrols, event security, and crime prevention and education programming as well as bicycle and laptop registration. Visit the department's website for additional information about the staff, emergency phone locations, crime prevention, lost and found,

fingerprint services, and annual statistic reports. Carnegie Mellon University publishes an annual campus security and fire safety report describing the university's security, alcohol and drug, sexual assault, and fire safety policies. The report also contains statistics about the number and type of crimes committed on the campus and the number and cause of fires in campus residence facilities during the preceding three years. Graduate students can obtain a copy by contacting the University Police Department at [x2323](tel:412-232-2323). The annual security and fire safety report is also available online at:

<https://www.cmu.edu/police/annualreports/>

18.6 Shuttle and Escort Services

<https://www.cmu.edu/parking/transport/>

Parking and Transportation coordinates the Shuttle Service and Escort Service provided for CMU students, faculty, and community. The Shuttle & Escort website has full information about these services, stops, routes, tracking and schedules.

19 The WORD

<https://www.cmu.edu/student-affairs/theword/>

The WORD is Carnegie Mellon University's online student handbook and serves as the foundation for the department (and sometimes college) handbook. The WORD contains university-wide academic policy information and resources, community policies and resources, and describes the university level procedures used to review possible violations of these standards. It is designed to provide all students with the tools, guidance, and insights to help you achieve your full potential as a member of the Carnegie Mellon community. Graduate students are encouraged to bookmark this site and refer to it often. University policies can also be found in full text at:

<https://www.cmu.edu/policies/>.