



Electrical & Computer Engineering

**2020-2021 MS Catalog/Handbook**

ECE Office of Graduate Affairs

This document is for the internal use of the Department of Electrical and Computer Engineering at Carnegie Mellon University only and may not be distributed or reproduced for external distribution in any form without express written permission of the Department Head of the Department of Electrical and Computer Engineering. This handbook is posted to the ECE Master's [webpage](#) prior to the start of each academic year and is updated as needed.

Carnegie Mellon University  
5000 Forbes Avenue  
Pittsburgh, PA 15213-3890  
(412) 268-2000  
[www.cmu.edu](http://www.cmu.edu)

## TABLE OF CONTENTS

<b>WELCOME TO ELECTRICAL AND COMPUTER ENGINEERING</b>	<b>6</b>
Core Values	7
Vision	7
Mission	7
<b>INTRODUCTION</b>	<b>8</b>
Graduate Degrees and Programs Offered	8
Graduate Student Catalog/Handbook	8
<b>CARNEGIE MELLON POLICIES, EXPECTATIONS, STATEMENT OF ASSURANCE, AND CODE</b>	<b>9</b>
Carnegie Mellon Policies & Expectations	9
Carnegie Mellon Statement of Assurance	9
<a href="https://www.cmu.edu/policies/administrative-and-governance/statement-of-assurance.html">https://www.cmu.edu/policies/administrative-and-governance/statement-of-assurance.html</a>	10
Carnegie Mellon Code	10
Carnegie Mellon Child Protection Requirements	10
<b>DEPARTMENTAL INFORMATION</b>	<b>11</b>
University Personnel	11
University Resources	11
Stellic Degree Audit	11
University Resource Websites	11
University Library	12
Department Resources	12
Advising	12
Graduate Studies Committee (GSC)	13
Bulletin Boards	13
Tech & Receiving	13
Computer Clusters	13
Printers	13
Department Office/Building Security, Repairs and Services	13
ECE Graduate Student Organizations	13
Press & Media Relations	14
Electrical & Computer Engineering Brand & Logos	14
<b>PRE-MATRICULATION</b>	<b>14</b>
Admissions Policies	14
TOEFL Requirements and Language Proficiency	14
Deferral	15
Final Undergraduate Transcripts	15
Responsible Conduct of Research (RCR) Education	15
<b>ENROLLMENT AND REGISTRATION</b>	<b>16</b>
Overview	16
Degree Progress and Planning	16
Student Responsibility	16
Degree Requirements Timeframe	16
Summer Registration	17

Full and Part-time Requirements	17
Statute of Limitations	18
Campus Location Change	18
Change of Degree Program	18
Courses Outside of Degree Requirements	19
Double Counting Courses	19
Maximum Units Allowed	19
Maximum Units Allowed Outside CIT	19
MS Concentrations	20
Retaking Courses	20
Auditing Courses	20
Pass/No Pass Courses	21
Petition Process	21
Course Transfer Request Policy and Process	22
Pittsburgh Council on Higher Education (PCHE) Cross-Registration Program	23
Research for Credit	23
Registering for Courses	24
Academic Calendar	24
Course Load	24
Adding Courses	25
Course Locations	25
Dropping Courses	25
Withdrawing from Courses	26
Waitlists	26
Remote Courses	26
Courses with Time Conflicts	27
Prerequisites	27
Antirequisites	27
Corequisites	28
Cross-listed Courses	28
Final Exams	28
Research Assistant & Teaching Assistant Positions	28
Research for Assistant for Credit	28
Research for Assistant for Pay	29
Teaching Assistant Positions	29
Enrollment Verifications	30
Leave of Absence	30
Returning from a Leave of Absence	30
Degree Certification Process & Commencement	31
<b>ACADEMIC STANDARDS</b>	<b>31</b>
Grades	31
University Policy on Grades	31
CIT Grading Policy	31
Incomplete Grade	32
Withdrawal Grade/Withdrawing from Courses	32
Academic Performance	33
Quality Point Average	33

Academic Probation	33
Academic Integrity	33
Penalties for Violating Academic Integrity	33
Disciplinary Probation	33
<b>MS DEGREE REQUIREMENTS</b>	<b>34</b>
Spring 2020 & Prior	34
Fall 2020 & Later	36
MS Concentrations	45
Integrated Master's/Bachelor's Program	45
Course Restrictions	45
Internship Course Option	45
<b>POST-MATRICULATION GUIDELINES</b>	<b>46</b>
Return of University Property	46
Career Services Employment Outcomes	46
"Grandfather" Clause	46
<b>TUITION AND FEES</b>	<b>46</b>
Tuition Billing & Payments	47
Part-Time Students	47
University Financial Aid	47
Student Financial Obligation	47
<b>CAREER SERVICES</b>	<b>47</b>
Career Consultants	47
Job Search Guidelines	48
CMU First Destination Outcomes	48
Employment with ECE Department	48
<b>UNIVERSITY POLICIES</b>	<b>48</b>
Academic Integrity	48
Assistance for Individuals with Disabilities	49
Evaluation & Certification of English Fluency for Instructors	49
Leave of Absence & Withdrawal Policies	49
Tuition Refund Policy	50
Returning to Carnegie Mellon	50
Retention of Student Records	50
Safeguarding Educational Equity – Sexual Harassment and Sexual Assault Policy	50
Suspension/Required Withdrawal Policy	51
Withdrawal of a Degree	51
Withdrawal from Program	51
University Grievances	52
Student Maternity Accommodation Protocol	52
Verification of Employment	52

## WELCOME TO ELECTRICAL AND COMPUTER ENGINEERING

Welcome to the Department of Electrical and Computer Engineering at Carnegie Mellon University. Since offering our first course in electrical engineering in 1908, our research and teaching has expanded to cover areas as broad as device sciences and nanotechnology, computer systems, data science, energy, control, communications, and circuits. The 2019 *US News and World Report* ranked our graduate programs in electrical engineering and computer engineering 8<sup>th</sup> and 3<sup>rd</sup> in the nation, respectively, and we offer programs in Pittsburgh, Silicon Valley, Portugal, and Africa.

Our distinguished faculty work closely with students to push the boundaries of technology and to shape the future of energy systems, bio-electronics, computing, data storage, and much more.

Please don't hesitate to contact us if you have any questions or comments.

Sincerely,

Larry Pileggi  
Tanoto Professor and Department Head  
Electrical and Computer Engineering

## Core Values

The ECE Department has been a leader in both research and education for years; it is known for its innovative qualities, boldness of ideas, and unbridled enthusiasm. Our strategic plan is guided by our core values.

**We value scientific truth, creativity, quality, innovation, and engineering solutions, all within a diverse and inclusive community guided by respect and joy of doing.**

Our core values form the foundation for what we do; we hold them to be intrinsically true. We believe in solving problems that have large societal impact. We also believe that to be successful, we must work within an environment of enthusiasm and openness, respect and integrity, and freedom to express and explore a variety of ideas.

## Vision

Our vision is our guiding light; it informs and propels us in the right direction. The strategies of following that path change over time, but the vision does not.

**To be a creative driving force within the university and worldwide of highest scholarly and entrepreneurial quality.**

## Mission

Our mission is our “what, who, how”; it explains what we do, who we do it for, and how we do it so we engage the “hearts, heads, and hands” of our faculty, students, and staff in achieving our objectives.

**To inspire, educate, and produce electrical and computer engineers capable of tackling fundamental scientific problems and important societal challenges, and to do so with the highest commitment to quality, integrity, and respect for others.**

We aim to be the best at what we do and to apply all our skills and knowledge to executing our vision. We educate young people to become engineers sought after by industry and academia alike; we do so in an environment imbued with enthusiasm and love for what we do, with respect and willingness to listen to each other, and with the freedom to express our ideas and look at challenges from various points of view. We strive to be the ECE department of choice for those who are willing to step off the beaten path, for the visionaries and dreamers.

## INTRODUCTION

### Graduate Degrees and Programs Offered

Master of Science in Electrical and Computer Engineering, Standard Program

- Pittsburgh
- Silicon Valley
- Thailand
- Africa

Master of Science in Electrical and Computer Engineering, Applied Program

- Pittsburgh
- Silicon Valley

Master of Science in Electrical and Computer Engineering, Advanced Study Program

- Pittsburgh

Master of Science in Electrical and Computer Engineering, Applied Advanced Study Program

- Pittsburgh

Master of Science in Software Engineering, Standard Program

- Silicon Valley

Master of Science in Software Engineering, Applied Program

- Silicon Valley

Doctor of Philosophy in Electrical and Computer Engineering

- Pittsburgh
- Portugal
- Thailand
- Washington, D.C.

### Graduate Student Catalog/Handbook

This catalog/handbook is intended to set guidelines and expectations for new and current master's students in Electrical and Computer Engineering at Carnegie Mellon University. This catalog/handbook is not exhaustive and is subject to revision at any time by the ECE department. It covers master's students in Pittsburgh, Silicon Valley, Thailand, and Africa.

It is the responsibility of each student to read and understand the contents of this catalog/handbook.

This catalog/handbook, along with any revisions, will be posted and announced annually to the [ECE website](#). Students with disabilities may request this catalog/handbook in other formats by contacting the Graduate Affairs Office.

## CARNEGIE MELLON POLICIES, EXPECTATIONS, STATEMENT OF ASSURANCE, AND CODE

### Carnegie Mellon 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 - [www.cmu.edu/student-affairs/theword/index.html](http://www.cmu.edu/student-affairs/theword/index.html)

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

University Policies Website - [www.cmu.edu/policies/](http://www.cmu.edu/policies/)

Graduate Education Website - [www.cmu.edu/graduate/policies/index.html](http://www.cmu.edu/graduate/policies/index.html)

College of Engineering Website – [www.cit.cmu.edu/](http://www.cit.cmu.edu/)

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

### Carnegie Mellon 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 ombudsman, Carnegie Mellon University, 5000 Forbes Avenue, Pittsburgh, PA 15213, telephone 412-268-1018. 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](http://www.cmu.edu/police/annualreports).

Information regarding the application of Title IX, including to admission and employment decisions, the sexual misconduct grievance procedures and process, including how to file a report or a complaint of sex discrimination, how to file a report of sexual harassment, and how the university responds to such reports is available at [www.cmu.edu/title-ix](http://www.cmu.edu/title-ix). The Title IX coordinator may be reached at 5000 Forbes Ave., 140 Cyert Hall, Pittsburgh, PA 15213; 412-268-7125; or [tix@cmu.edu](mailto:tix@cmu.edu).

<https://www.cmu.edu/policies/administrative-and-governance/statement-of-assurance.html>

## 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, 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 and 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/>.

## Carnegie Mellon Child Protection Requirements

Carnegie Mellon is committed to providing a safe and secure environment for all minors involved in any programs or activities conducted on university premises, as well as any off-campus programs or activities sponsored by the university. Details are available through the Leonard Gelfand Center [Child Protection Operations](#).

If you have questions regarding Act 153 or encounter a situation when you would need to have appropriate clearances, please contact Tara Moe at [taramoe@ece.cmu.edu](mailto:taramoe@ece.cmu.edu).

## DEPARTMENTAL INFORMATION

### University Personnel

Throughout your time in the MS program, you will encounter a variety of faculty and staff who will help you on your way to completing your degree. You may view a [list of faculty](#) and a [list of staff](#) affiliated with ECE online. Below is a list of faculty and staff whom you are likely to encounter during your time in the MS program.

- Dean of the College of Engineering: [Professor William Sanders](#)
- Associate Dean of Graduate and Faculty Affairs: [Professor Shelley Anna](#)
- Department Head: [Professor Larry Pileggi](#)
- Executive Assistant to the Department Head & Executive Manager of Events: [Kimmy Nguyen](#)
- Director, CMU-Africa: [Professor Vijayakumar Bhagavatula](#)
- Associate Department Head for Research: [Professor Shawn Blanton](#)
- Associate Department Head for Academic Affairs: [Professor James A. Bain](#)
- Associate Department Head for Students: [Professor David O'Hallaron](#)
- Director of Finance and Sponsored Research: [Charlotte Ambrass](#)
- Director of Student and Academic Affairs: [Tara Moe](#)
- MS/UG Academic Program Advisor: [Mark Craven](#)
- MS/UG Academic Program Advisor: [Arleya Loss](#)
- MS/UG Academic Program Advisor: [Monique C. Moreland](#)
- MS/UG Academic Program Advisor: [Holly Skovira](#)
- PhD Academic Program Advisor: [Nathan Snizaski](#)
- Student Services Officer, CMU-Africa: [Olga Gikundiro Buki](#)

A general [list of contacts](#) can also be found on the ECE website.

### University Resources

#### Stellic Degree Audit

Each student has access to the Stellic Degree Audit Application which includes degree planning tools that can show how courses, planned or scheduled, meet the degree requirements. You can access Stellic through The Hub website at <https://www.cmu.edu/es/stellic/index.html>. Students should also meet with their academic advisor to review how their courses have been applied to the degree requirements.

#### University Resource Websites

Several pertinent university policies are included in this handbook, primarily found in the "University Policies" section. Complete university policies are available online at <http://www.cmu.edu/policies>.

Additional assistance is available in understanding community expectations, with the following resources being particularly relevant to ECE students. Information about these offices can be found in Appendix A of this handbook, or at the respective websites.

- The Office of the Assistant Vice Provost for Graduate Education: [www.cmu.edu/graduate](http://www.cmu.edu/graduate) (Email: [grad-ed@cmu.edu](mailto:grad-ed@cmu.edu))
- The Office of the Dean of Student Affairs: [www.cmu.edu/student-affairs/index.html](http://www.cmu.edu/student-affairs/index.html)
- Disability Resources: <https://www.cmu.edu/disability-resources/index.html>
- Eberly Center for Teaching Excellence: [www.cmu.edu/teaching](http://www.cmu.edu/teaching)
- Graduate Student Assembly: <http://www.cmu.edu/stugov/gsa/index.html>
- Language Support in the Student Academic Success Center: [www.cmu.edu/student-success/](http://www.cmu.edu/student-success/)
- Office of International Education: <https://www.cmu.edu/oie/>
- Counseling & Psychological Services: <https://www.cmu.edu/counseling/>
- Health Services: [www.cmu.edu/HealthServices](http://www.cmu.edu/HealthServices)
- University Police: [www.cmu.edu/police](http://www.cmu.edu/police)
- The Word: <http://www.cmu.edu/student-affairs/theword>
- Academic Integrity: [www.cmu.edu/academic-integrity](http://www.cmu.edu/academic-integrity)
- University Policies: [www.cmu.edu/policies/](http://www.cmu.edu/policies/)

Please refer to Appendix A for additional information about each of the aforementioned resources.

## University Library

Students in Pittsburgh have access to several on-campus libraries. More information about the libraries can be found on the CMU Library website: <https://www.library.cmu.edu>.

## Department Resources

### Advising

Each of you will have a *faculty advisor* and an *academic advisor*, listed in SIO, who work together as a team for you.

Your faculty advisor is your primary point of contact in the ECE MS program; they are full-time, PhD-trained faculty members who can help you with things like technical questions, course selection, career guidance, finding research projects, working with instructors, and more.

Your academic advisor is a skilled staff member who will be handling crucial compliance-related advising tasks for you behind the scenes, including tracking your progress through the program, certifying your graduation, and completing enrollment and university related paperwork.

Your academic advisor also serves as the backup for your faculty advisor if they need assistance with things like identifying campus resources or answering curriculum-related questions. Always feel free to contact your academic advisor if you're unable to get in touch with your faculty advisor.

The head of the ECE Advising Group is Professor David O'Hallaron, Associate Department Head for Students.

The faculty advisors are Professor Greg Kesden, Professor Tamal Mukherjee, Professor Bill Nace, Professor David O'Hallaron, Professor Asim Smailagic, and Professor Tom Sullivan.

The academic advisors are Mark Craven, Arleya Loss, Monique C. Moreland, and Holly Skovira.

## Graduate Studies Committee (GSC)

The Graduate Studies Committee is a committee consisting of ECE faculty and ex-officio administrators from the Student and Academic Affairs Office. The Graduate Studies Committee meets throughout the academic year to address student petitions, discuss program policies, and to approve and assign qualifying exams.

The GSC Chair for the 2020-2021 academic year is Professor L.R. Carley. Please ask your academic advisor when this semester's GSC meetings take place.

## Bulletin Boards

Bulletin boards are located throughout the department in Baker Hall, Porter Hall, Hamerschlag Hall (HH), and Roberts Hall. Bulletin boards will be cleared on a regular basis.

## Tech & Receiving

The Tech Electronics Shop and ECE Shipping and Receiving Department is located on the Pittsburgh campus in HH 1301 and its regular business hours are 9am-5pm, Monday through Friday. The Tech Electronics Shop offers a wide variety of parts, components, tools, and supplies used throughout the ECE Labs, which are available for use to all ECE students, faculty, and staff. The ECE Shipping and Receiving Department handles all incoming and outgoing packages for the department as well as the daily US Mail delivery. The ECE Shipping and Receiving Department has a large stock of shipping materials to assist with any outgoing package needs, as well as prompt notification of package arrival and delivery if necessary.

## Computer Clusters

Computer clusters are located in HH 1303. There are several remote access compute clusters located in the ITS Cyert Hall machine room. Various research groups or principle investigators have their own computer clusters. Access to those clusters is only available with the consent of the party who owns the cluster.

## Printers

**Printers** are provided for student academic use. Andrew public printing stations are available in HH A101, A104, 1303, and 1310.

## Department Office/Building Security, Repairs and Services

Any damages or repairs should be reported to Facilities Management Services, by emailing [fixit@andrew.cmu.edu](mailto:fixit@andrew.cmu.edu). For security concerns and in an emergency, please contact University Police at 412-268-2323.

## ECE Graduate Student Organizations

- **EGO** (ECE Graduate Student Organization): Organizes academic and social events throughout the academic year. Website: <https://www.archive.ece.cmu.edu/~ego/>
- **WinECE** (Women in ECE): Provides academic and social events to women in ECE throughout the year. Website: <https://cmuwinece.wixsite.com/winece/>

- **HKN** (Eta Kappa Nu): The honor society for Electrical and Computer Engineering students. Members engage in community service, professional engagement, and social activities. PhD students are invited by the board of HKN to join based on academic performance. Website: <https://www.ieee.org/education/hkn-index.html>
- **ECE Outreach**: A student organization that provides middle and high school students opportunities to learn about engineering and figure out whether it's a good career choice for them. The organization is run by ECE undergraduate and graduate student volunteers. Website: <http://eceoutreach.ece.cmu.edu/index.html>
- For more information on graduate student organizations and opportunities for future involvement in the ECE department, please send email to [ece-student-orgs@andrew.cmu.edu](mailto:ece-student-orgs@andrew.cmu.edu).

## Press & Media Relations

[Krista Burns](#) and [Kimmy Nguyen](#) act as the points-of-contact between news media and the ECE Department, including faculty, students, and staff. Krista and Kimmy can also provide guidance on internal and external relations and can assist with publicizing programs, projects, events, and other ECE affiliated activity.

## Electrical & Computer Engineering Brand & Logos

The Information Technology Services (ITS) website contains information regarding the department's branding and identity standards. <https://userguide.its.cit.cmu.edu/services/ece-graphics/>

## PRE-MATRICULATION

### Admissions Policies

For information about ECE's admission policies, including application requirements, application deadlines, and a link to apply, please visit these webpages:

- <https://www.ece.cmu.edu/admissions/graduate-application-deadlines.html>
- <https://www.ece.cmu.edu/admissions/graduate-faq.html>

### TOEFL Requirements and Language Proficiency

The TOEFL test is required of all international applicants whose native language is not English. Native language is defined as first language, or language spoken from birth. The TOEFL is not

required if the applicant has graduated from a U.S. university or if the applicant is a CMU student or alumni.

The Admissions Committee prefers the TOEFL to the IELTS. While you are encouraged to take the TOEFL, if you are unable to do so, we look for a minimum overall score of 7 on the IELTS, with minimum sub-scores of Reading-6.5, Listening-6.5, Speaking-6, and Writing-6.

Non-native English speakers may utilize the Language Support in the Student Academic Success Center for language support: <https://www.cmu.edu/student-success/>.

## Deferral

ECE generally does not allow admission deferrals because admission decisions are based on the current applicant pool. Therefore, students are admitted into the program for a particular semester only. If a student wishes to attend in a future semester, the student must reapply to the ECE program.

Integrated Master and Bachelor students (IMBs) will be permitted to take up to a two year deferral between their undergraduate degree and their master's degree only if they have completed a minimum of 24 units towards their master's degree at the time of their undergraduate graduation.

## Final Undergraduate Transcripts

Applicants admitted to any ECE program (except for CMU alumni) must submit final official transcripts, properly sealed, upon completion of their undergraduate program from the institution conferring their degree as a condition of enrollment at Carnegie Mellon. Certificates of graduation and/or degree certificates should also be submitted if provided by the institution. Failure to provide such documents that confirm the completion of undergraduate requirements by the end of the first semester of study at Carnegie Mellon may prevent the MS degree from being certified.

## Responsible Conduct of Research (RCR) Education

The Office of Research Integrity and Compliance website (<https://www.cmu.edu/research-compliance/index.html>) describes the university's position on ethical research: "Carnegie Mellon University promotes the responsible conduct of research through high standards of ethics and accountability in planning, conducting and reporting research. The responsible conduct of research is demonstrated through behavior that meets generally accepted standards. These standards are set forth by state and federal regulations, institutional policies, professional codes of conduct and personal convictions."

In support of the university's position, ECE requires **all incoming students** to take the appropriate online training offered by the Collaborative Institutional Training Initiative (CITI). The CITI physical science module package is recommended rather than the module package for engineers, although both are acceptable. The courses are available via CITI through the Office of Research Integrity and Compliance website. Select Carnegie Mellon University as your participating institution when you create your account. Website: <https://www.cmu.edu/research-compliance/responsible-conduct/training.html>

The course(s) may take a few hours to complete but can be done over a period of time. Upon completion of the course(s), students will need to provide their certificate to the Graduate Affairs Office. Instructions on how to submit this certificate are communicated prior to the beginning of the semester.

## ENROLLMENT AND REGISTRATION

### Overview

After matriculating into ECE, students should create an academic plan and register for courses. Students should actively engage in this process by reviewing degree requirements on the website and connecting with their academic advisor. Once plans are firm, students can proceed by accessing Student Information Online (SIO).

SIO is an important online tool to use during the registration process, as well as throughout graduate school. Students can access SIO here: <https://www.cmu.edu/hub/sio/about.html>

Within SIO, students can use the Course Planning module to view and modify their proposed schedule before registering for courses. Once a schedule is developed, it is the student's responsibility to register for courses using their SIO. Students must be registered for every course that they plan to take for the semester, even if it is not taken for credit (e.g. audited courses).

After the first semester, a student's assigned registration time is determined by the number of completed units and cannot be changed. If a student's tuition balance and/or fees are greater than \$0.00, the student will not be able to register until the balance is cleared.

### Degree Progress and Planning

#### Student Responsibility

It is the sole responsibility of the student to manage the academic progression of their program. Students are expected to ensure that they are taking the necessary prerequisites and courses to complete degree requirements on time. Students have the ability to add courses, drop courses, and select units for variable unit courses through SIO. It is the students' responsibility to be aware of all academic deadlines, including the add deadline, the drop deadline, the pass/fail deadline, and the audit deadline. Academic deadline information can be found in the academic calendar: <https://www.cmu.edu/hub/calendar/index.html>

If a student is not progressing as expected or is concerned that they are unable to complete degree requirements, they are expected to seek counsel from their advisor.

#### Degree Requirements Timeframe

The duration of the ECE program for students starting the program in Spring 2020 or prior is 3 full-time semesters (fall-spring-fall or spring-fall-spring). Students starting in Fall 2020 or later can choose to join the Standard or Applied program for 3 full-time semesters or the Advanced Study or Applied Advanced Study programs for 4 full-time semesters. In order to have full-time status, students must enroll in at least 36 units each semester. In order to complete program requirements, students may need to enroll in more than 36 units per semester. The maximum number of units allowed in a semester is 48 units. Students are responsible for completing their

enrollment each semester via their Student Information Online (SIO) portal. Students who are not enrolled by the tenth day of class will be withdrawn from the university.

Students must be physically present and attend class at the start of the semester. If extenuating circumstances exist that prevent a student from attending class, a student must notify the academic advisor and instructors immediately. Not attending class from the start of the semester will have a detrimental effect on a student's progress in the program. ECE will make an effort to verify all students have arrived to begin their program and will consider a student as "withdrawn from the university" if they are not here by the tenth day of class as defined by the academic calendar.

International students will be given a 16 month I-20 for 3-semester programs and a 24 month I-20 for 4-semester programs or DS-2019. International students must consult with CMU's Office of International Education (OIE) for questions on extension of their visa documents or if they complete their degree requirements in fewer than three semesters. Please see details and relevant forms on OIE's website under Maintaining Legal Status: <https://www.cmu.edu/oie/foreign-students/maintain-legal-status/index.html>

### Summer Registration

Students are not required to continue their studies over the summer as the summer semester is considered a vacation semester. However, students may choose to take courses for academic credit or pursue an internship that is relevant to their MS degree if appropriate.

Eligible international students who are completing an internship in the United States must complete the paperwork for Curricular Practical Training (CPT). Academic and OIE advisors will provide students with information about CPT during the spring semester. For more information about internships and CPT, see the "Internship" section outlined in this handbook and OIE's website on Employment Options for international students: <https://www.cmu.edu/oie/foreign-students/employment.html>

### Full and Part-time Requirements

The MS degree program is a full-time program in which students complete a minimum of 36 units each semester (including summer if summer is a student's final semester). Students who are interested and qualified may take an accelerated course load and complete the degree in 2 semesters; these students should consult with their primary academic advisor.

In extenuating circumstances, students may find that they may need to take a reduced course load. Extenuating circumstances that will be considered include medical reasons, initial academic difficulty due to problems with English language or the student being unfamiliar with U.S. teaching methods, or being placed in an improper course level. These students must submit an Authorization for a Reduced Course Load form to their academic advisor. <https://www.cmu.edu/oie/foreign-students/docs/reduced.pdf>

Part-time master's enrollment is an option available for students in special circumstances, such as students who would like to pursue an MS degree while maintaining external employment. Note that immigration regulations do not allow Carnegie Mellon University to issue visa documents for a part-time status.

## Statute of Limitations

ECE adheres to CIT's policy on MS completion timelines. As outlined in the Master's Students Statute of Limitations (<https://www.cmu.edu/policies/student-and-student-life/masters-students-statue-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.

## Campus Location Change

Students enrolled in the ECE Master's program at the Pittsburgh, Silicon Valley, or CMU-Africa locations may be eligible to request a change in residence to another campus after completing one semester of full-time study. Eligibility is determined by the details included in the student's admission offer and is explicitly stated in the admission offer letter. Due to limited space, location changes are not guaranteed and are subject to the discretion of the department. The students are responsible for all academic and financial impacts related to this change. Information about the location change process will be provided to eligible students.

International student internship eligibility will not be affected if students change location between Silicon Valley and Pittsburgh campuses. Location changes between U.S.-based campuses and CMU-Africa will have implications for internship eligibility for international students. Please refer to OIE's website for employment options and consult with your OIE advisor for additional questions: <https://www.cmu.edu/oie/foreign-students/employment.html>

## Change of Degree Program

Sometimes students begin their MS ECE program and realize that would like to transfer to the MS SE degree program instead. When this occurs, students may have the option of applying to transfer to another MS degree program in the ECE Department (MS SE). Students must meet with their academic advisor to determine if this is possible. Information about the degree change application and process will be provided to the students at that time. All degree program change applications are reviewed by the ECE Admissions Committee and are subjected to the same admission standards as initial applications to the program. Program changes are not guaranteed. In the case where a program change will also result in a campus location change, students are subject to the same policies outlined in the Campus Location Change section in this handbook.

Please note that students are not eligible to change degree programs until after they have successfully completed 36 units at CMU, and all applications will be considered for the following semester. Students are responsible for all academic and financial impacts related to the change. Prior to changing to a new MS degree program, international students should consult with OIE.

## Courses Outside of Degree Requirements

Courses that do not satisfy degree requirements include StuCo courses (98-xxx), Physical Education course (69-XXX), audited courses, and pass/fail courses. Similar to courses taken for degree requirements, students must register for these courses and the units will count towards their course load for the semester. For a complete list of course restrictions, see the ECE website: <https://www.ece.cmu.edu/academics/ms-ece/requirements.html>.

## Double Counting Courses

ECE follows the CIT Policy on double counting courses. Students are required to notify the Graduate Affairs Office prior to declaring a degree outside of ECE as this may have repercussions for your units and coursework to date. Website: <https://www.cit.cmu.edu/education/academic-policies/graduate-policies/registration-grading-credit.html#double-counting-of-course-units-for-m.s.-and-ph.d.-degrees>

If a student takes the same course twice, only the course with the higher grade will be counted towards the MS ECE course requirements.

## Maximum Units Allowed

Students who are pursuing the MS degree cannot register for their final semester if they have already completed 120 units (for the 3 semester program) or 156 (for the 4 semester program) of coursework. These units include courses taken for audit, pass/no pass, and withdrawal. Please refer to the CIT policy on MS degree units for additional information: <https://www.cit.cmu.edu/education/academic-policies/graduate-policies/registration-grading-credit.html#m.s.-degree-units>

If it becomes clear that a student will exceed the maximum units and not be able to maintain the required 3.0 average, the student may be dropped from the MS ECE or SE program.

## Maximum Units Allowed Outside CIT

Matriculating students between fall 2018 and spring 2020 in the MS ECE and MS SE programs at all campuses may take no more than 48 units outside the College of Engineering, even if a student has already completed all degree requirements. Please see the MS ECE Requirements page on our website for details on which students this rule affects: <https://www.ece.cmu.edu/academics/ms-ece/requirements.html>

Courses will satisfy requirements based on the course number during the semester of registration. If a course number that it outside of CIT changes to be within CIT, the change will not be retroactive and the course will still qualify as being outside of CIT for all past semesters.

## MS Concentrations

Five concentrations are available for students to choose from, allowing for focused study in a specific area of ECE. Students completing one or more of these concentrations should refer to their degree as a Master of Science in Electrical and Computer Engineering with a concentration in <name of concentration>. Students satisfying the requirements for more than one concentration may acknowledge all for which they fulfill the requirements.

All concentrations require a minimum of four ECE courses distributed across categories as described below. MS ECE students are not required to complete a concentration in order to graduate.

- Cyber-Physical Systems (CPS)
- Computer Security (CSec)
- Data and Network Science (DNS)
- Wireless Systems (WS)
- Integrated Systems Design (ISD)

For a list of approved courses within each concentration and faculty points of contact for each, visit the website: <https://www.ece.cmu.edu/academics/ms-ece/concentrations.html>

## Retaking Courses

If a student does not pass a course, they should take a different course to fulfill the requirement. If you are considering retaking a course, please see your academic advisor. Students may retake a prerequisite course in which they did not receive the minimum grade required.

All grades are recorded on the transcript and factored into the cumulative QPA. However, only the best 97 units that fulfill degree requirements are factored into the required 3.0 graduation QPA.

## Auditing Courses

Auditing a course is being present in a classroom without receiving academic credit or a letter grade. An audited course will appear on a student's transcript. Students who are present in a classroom and who are not receiving academic credit or a letter grade must audit the class to continue to attend regularly.

A student who wants to audit a course is required to:

1. Register for the course in SIO.
2. Obtain permission from the instructor and ask the instructor to sign the course audit approval form: <https://www.cmu.edu/hub/docs/course-audit.pdf>
3. Submit the form to their academic advisor for approval.
4. If approved, the academic advisor will send the form to the HUB for processing.

Once a course audit approval form is submitted to the HUB, a letter grade ('A'-'R') will not be assigned for the course and the declaration cannot be reversed. You can find the deadline for

submitting this form on the academic calendar. After the deadline, students are not able to request the option to audit a course.

The extent of the student's participation must be arranged and approved by the course instructor. Typically, auditors are expected to attend class as though they are regular class members. Those who do not attend the class regularly or prepare themselves for class will receive a blank grade. Otherwise, the student receives the grade 'O', indicating an audit.

The units of audited courses count toward the maximum course load units, but do not count toward the degree requirements. If an audited course is outside the College of Engineering (CIT), those units count towards the 48 units MS ECE students may take outside the CIT. Any student may audit a course. For billing, an audited course is considered the same as the traditional courses under the tuition charges. If a part-time student audits a course, he/she will be charged part-time tuition based on the per unit tuition rate for the course.

### Pass/No Pass Courses

Students who want to take a course pass/fail are required to register for the course and submit the pass/no pass approval form (<https://www.cmu.edu/hub/docs/pass-fail.pdf>) to their academic advisor. If approved, the academic advisor will send the form to the HUB for processing.

Once a pass/no pass approval form is submitted to the HUB, a letter grade ('A'-'R') will not be assigned for the course and the declaration cannot be reversed. Passing work (letter grade 'A'-'C') is recorded as 'P' (passing grade) or 'S' (satisfactory) on the student's academic record, with both grades meaning the same thing; work with a grade at or lower than 'C-' will not receive credit and will be recorded as 'N' (not passing grade) on the student's academic record. No quality points will be assigned to 'P'/'S' or 'N' grades; the units of 'P'/'S' or 'N' grades will not be factored into the student's QPA.

The units of pass/no pass courses count toward the maximum course load units, but do not count toward the degree requirements. You can find the deadline for submitting this form on the academic calendar. After the deadline, students are not able to request to pass/no pass a course.

Any student may take a course pass/no pass. For billing, the course is considered the same as traditional courses under the tuition charges. If a part-time student takes a course pass/no pass, they are charged part-time tuition based on the per unit tuition rate for the course.

### Petition Process

Petitions to the GSC may include program changes or transfers, increase in units, course substitutions, and any other changes outside of the policies stated in the handbook. Petitions are approved by the GSC. Students are advised to discuss petitions with their academic advisors.

The petition process is as follows:

1. Student completes the MS ECE GSC Petition form (<https://www.ece.cmu.edu/insider/grads/forms/gsc-ms-course-approval-petition.pdf>) and submits it to their academic advisor no later than 5pm EST on the Friday before a GSC meeting.
2. Academic advisor presents the petition to the GSC.

3. Students are notified of the outcome of their petition via an email from their academic advisor after the GSC has met. Generally, all GSC decisions are final.
4. Due to time constraints, some petitions may be tabled until the following GSC meeting. If this occurs, students will be notified via email.
5. Academic advisor saves a finalized version of the petition in the student's academic file.

## Course Transfer Request Policy and Process

Only one graduate-level course, or the equivalent of 12 units, can be transferred from another university as credit toward the MS degree. As a guideline, 3-credit courses from other universities equate to 9-unit CMU courses; a 4-credit course equates to a 12-unit CMU course.

The course being transferred in must:

- Fulfill an ECE degree course requirement and be equivalent to a CMU course
- Be considered a graduate level course at the university where it was taken (unless requesting transfer credit for the one allowed undergraduate course)
- Have not been used to fulfill requirements for any previously earned degree

Please note that this policy is more restrictive than the CIT transfer credit policy (<https://www.cit.cmu.edu/education/academic-policies/graduate-policies/registration-grading-credit.html#transfer-credit-&-special-students>). A grade of 'B' or better must be earned for the course to be transferred. The transfer credits will appear on the student's transcript and will not be factored into the QPA.

Transfer credit is not granted prior to admission and must be approved by the Graduate Studies Committee and CIT Dean's Office. Courses can only be requested for transfer after the student has successfully completed 36 units of coursework at Carnegie Mellon. After matriculating to Carnegie Mellon, ECE students should consult with their academic advisor before taking a course at another university.

Transfer courses will be reviewed for academic rigor and alignment with courses offered in ECE. The course description and syllabus, learning outcomes, delivery mode, and institutional accreditation will be considered when evaluating the course for transfer.

The process for requesting to transfer a course is as follows:

1. Meet with academic advisor to discuss the course transfer.
2. Complete and collect the following mandatory documents:
  - a. MS ECE GSC Petition form: <https://www.ece.cmu.edu/insider/grads/forms/gsc-ms-course-approval-petition.pdf>
  - b. Official transcript from previous institution
  - c. Detailed course description/syllabus (should include grading scale, assignments required, mandatory books, and time required in class) of the course you wish to transfer
  - d. Letter from the previous institution's registrar or academic advisor stating the course intended for transfer was not used towards a degree

- e. E-mail endorsement from the instructor of the CMU course you believe your transfer course is most equivalent to
  - f. CIT Graduate Transfer Credit Request form:  
[https://engineering.cmu.edu/\\_files/documents/graduate-students/grad\\_transfer\\_credit\\_request.pdf](https://engineering.cmu.edu/_files/documents/graduate-students/grad_transfer_credit_request.pdf)
3. Submit the completed packet to the academic advisor.
  4. Academic advisor will present the transfer request to the CIT Dean's office and notify the student of the result.
  5. Once the petition is approved, academic advisor works with the student to complete the transfer request.

### Pittsburgh Council on Higher Education (PCHE) Cross-Registration Program

Full-time Carnegie Mellon students may take subjects for credit through the Pittsburgh Council on Higher Education (PCHE). The purpose is to provide opportunities for enriched educational programs by permitting full-time paying undergraduate and graduate students to cross-register for one course at any of the ten PCHE institutions. Please refer to The HUB's website for additional details: <https://www.cmu.edu/hub/registrar/registration/cross/>

### Transfer Courses & 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 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.) Please review the following link to find more information: <https://www.cmu.edu/policies/student-and-student-life/transfer-credit-evaluation-and-assignment.html>

### Research for Credit

Students matriculating spring 2020 and prior can apply up to 27 units of research credit towards their MS degree requirements by registering for the MS Research Project (18-980) course. This also applies to students matriculating fall 2020 and later who select the course option within their program.

\*Please note – for course option students matriculating fall 2020 and later, only 12 units of MS Graduate Research Project (18-980) can be counted towards the core Graduate Coursework requirement.

Students who have matriculated fall 2020 and later and have been accepted to the project option will be required to complete 36 units of research credit.

The number of units registered for should equal the number of hours you complete each week. For example, 12 units of research means the student should complete 12 hours of research each week. Alternative accommodations should be worked out with the supervising faculty member.

Research Approval Process:

- As an ECE student, you are able to view and apply for available research projects through Student Project Tracker (SPT) (<https://www.ece.cmu.edu/apps/spt/>) electronically. New students gain access to the system on the first day of classes.
- View details of the research projects listed and click the “apply” button to apply.
- Your application will be reviewed by the research instructor. You will be contacted by the research instructor (or someone from their research lab) if there is an interest in your application.
- The research instructor will inform your advisor through the SPT system if your application is approved and your advisor will register you for the appropriate research units. You will be registered for 18-980 based on the units reflected in the SPT system.
- If you already have a research project set up with a faculty member, the project still needs to be created in this portal. You must apply and get accepted through the system.
- If you are planning on conducting research with a non-ECE faculty member, the project must still be posted in SPT. You and/or your research instructor must find an ECE faculty member who will be a co-research instructor for the project.

## Registering for Courses

### Academic Calendar

The Academic Calendar can be found at <https://www.cmu.edu/hub/calendar/index.html> and provides information on all deadlines including registration dates, class start dates, add/drop deadlines, exam dates, and more. ECE adheres to the official CMU academic calendar. The Heinz College and the Tepper School follow their own calendars with dates that may differ from the University’s calendar for the add, drop, and pass/fail/audit deadlines. ECE students must adhere to the deadlines of the courses they are taking if the courses are in Heinz or Tepper.

### Course Load

Due to the rigor of the MS ECE program, students are advised to take 37 units of courses in their first semester (36 units of coursework plus 18-989, Intro to Grad Studies) and 36 units of courses each semester thereafter. However, we recognize that our student body is diverse, and that includes how each student handles their course load. While students may register for a maximum

of 48 units each semester, we strongly recommend students take no more than 36 units each semester. Students unsure of whether they should take 48 units should schedule an appointment with their academic advisor to discuss their reasons for overloading and prepare a plan for handling the additional load.

IMB students may request an overload if the four courses they opt to take exceed 48 units. In order for the overload to be considered, the following conditions must be met: 1) the overload request is only for four courses that exceed 48 units, 2) as an undergraduate student, the IMB student has overloaded in a semester and achieved a minimum QPA of 3.5 during that semester, and 3) the IMB student maintained a minimum of a cumulative 3.75 QPA as an undergraduate student.

## Adding Courses

Students have the option of adding courses to their schedule starting at their assigned registration time until the add/drop deadline through SIO. If a student wishes to be added to a course after the add/drop deadline, the Course Add Request Form (<https://www.cmu.edu/hub/docs/late-add.pdf>) must be completed and signed by the course instructor. Then, the student must submit the form to their academic advisor for approval. If approved, the academic advisor will send the form to the HUB for processing.

In the event that an ECE course (18-XXX) is cross-listed with a course from another department, ECE students must register for the ECE course number.

MS ECE students may take course in the Tepper School of Business and can register through Tepper's system outside SIO. Tepper publishes a list of available MBA courses for non-MBA students, and in order to register, students should visit the Tepper registration site: <https://www.cmu.edu/tepper/programs/mba/curriculum/mba-course-requests/carnegie-mellon-graduate-students.html>

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.

## Course Locations

Courses take place in various buildings and room locations across CMU as assigned by the University Registrar's office each academic semester. Each course location is tied to a section and has a final assignment that is linked to the final grade. It could be in the form of a final exam, final project, or research as stated in the syllabus on the first day of classes. Students should register for sections of their courses according to their physical campus location. Please refer to the schedule of classes for a list of which classes are offered this semester.

## Dropping Courses

Students have the option of dropping courses from their schedule starting at their assigned registration time until the add/drop deadline through SIO. When a course is dropped before the drop deadline, it does not appear on the transcript. As a courtesy to others, students should drop

a course as soon as they decide not to take it. This will allow a waitlisted student to be enrolled and will limit disruptions to any team-based projects.

## Withdrawing from Courses

Students should remove themselves from a course before the drop deadline each semester. If a student chooses to withdraw from a course after the drop deadline, they must officially withdraw from the course and should consult with their advisor to discuss the withdrawal. Withdrawals take place after the drop deadline through the course withdrawal deadline. Students must complete and submit the Course Withdrawal Request Form (<https://www.cmu.edu/hub/docs/course-withdrawal.pdf>) with their academic advisor in order to withdraw from a course. More information on withdrawal grades can be found on the CMU policy website under the grading policy (<https://www.cmu.edu/policies/student-and-student-life/grading.html>). Withdrawals receive a “W” grade for the course on a transcript which is not factored into the QPA. However, withdrawn courses do count towards the maximum 120 units and, if they are outside the College of Engineering (CIT), towards the 48 units students may take outside the CIT.

## Waitlists

It is typical to be waitlisted from the time of registration up until the tenth day of class. This is common practice across the university to ensure that students have the opportunity to take the courses they need to graduate. You should only attend courses for which you are waitlisted if you have permission from the instructor. Students may only be waitlisted for a maximum of 5 courses.

As a courtesy, students should remove themselves from the waitlist and/or drop a course in a timely fashion so as to allow other students the opportunity to be removed from the waitlist and enrolled in a course.

Students should check their schedules frequently on SIO as they may be enrolled from a waitlist without being notified. In addition, during the registration process, the Registrar’s Office will require students to “tag up” on their waitlists in order to confirm the desire to remain on the waitlist for a course. Failure to confirm their waitlists will result in being dropped from the waitlist.

It is strongly recommended that students have a back-up plan in case they are not removed from a waitlist by the tenth day of class.

## Remote Courses

CMU offers courses that are taught exclusively online, and some have a live recitation component. ECE refers to them as “Technology Enhanced” courses and can be identified by the section code that includes “T”. Departments with online courses may list their technology enhanced courses in a different format, so be sure to check with the instructor if it is unclear whether a course is online. International students on a US residential campus (i.e., Pittsburgh) may take a maximum of one online course per semester that does not have a required in-person component, per F1 regulations.

## Courses with Time Conflicts

Students are not permitted to register for 2 courses that overlap. Registration may be possible with consent from both instructors, allowing the conflict or attendance at an alternate time. Students should forward permissions from instructors to their academic advisor in order to register for conflicting courses.

## Prerequisites

A prerequisite is a listed course in SIO that is strongly recommended preparation for the listed course. All prerequisites will be listed and available for view in SIO.

While SIO may allow you to register for courses without the published prerequisite, it is the student's responsibility to have adequate background knowledge to be successful in the subsequent course. This background knowledge may come in the form of an introductory course taken at Carnegie Mellon, your undergraduate institution, or other work or research experience. You should consult with the instructor because it is up to their discretion whether or not a prerequisite course can be waived.

For ECE courses that require 18-613/15-213/15-513/18-213 as a prerequisite, students will not be permitted to enroll in the subsequent course without credit for 18-613/15-513. 18-613 and 15-513 are the only courses available to graduate students that satisfy the prerequisite requirement. Students attending Pittsburgh campus can plan to take 15-513 in the summer prior to their matriculation in the fall semester. Tuition will apply at a per unit rate.

Some of the graduate courses that require 18-613/15-213/15-513/18-213 anywhere in their prerequisite tree include:

- 18-648 – Embedded Real-Time Systems
- 18-649 – Distributed Embedded Systems
- 18-656 – Data Intensive Workflow Development for Software Engineers
- 18-725 – Advanced Digital Integrated Circuit Design
- 18-740 – Computer Architecture
- 18-742 – Parallel Computer Architecture
- 18-745 – Rapid Prototyping of Computer Systems
- 18-746 – Advanced Storage Systems
- 18-748 – Wireless Sensor Networks
- 18-756 – Packet Switching and Computer Networks
- 18-759 – Wireless Networks
- 18-842 – Distributed Systems
- 18-845 – Internet Services
- 18-848 – Special Topics in Embedded Systems

## Antirequisites

An antirequisite is a course with content that is so similar to another existing course that a student cannot receive credit for taking both.

For example, 15-513 (Introduction to Computer Systems) and 18-600 (Foundations of Computer Systems) are antirequisites. The content in these courses are so similar that the student would not gain sufficient new knowledge from taking both courses as to be worthy of receiving academic credit. As a result, a student may only receive credit towards their degree for taking one of them. All antirequisites are listed in SIO.

## Corequisites

A corequisite is a course that must be taken at the same time as another course. These courses will be listed and available for view in SIO.

## Cross-listed Courses

A cross-listed course is a course that has two course numbers, each with their own section, but are taught or co-taught by the same faculty.

There are two types of cross-listed courses. The first is a course that has both an undergraduate and graduate section. For instance, 18-441 and 18-741 (Computer Networks) is a course within ECE that has both an undergraduate section and a graduate section. The second is a course that is cross-listed across two departments. For instance, 11-785 and 18-786 (Introduction to Deep Learning) are courses that are cross-listed in ECE and the Language Technologies Institute.

Selecting the appropriate section for these cross-listed courses is imperative. You will not receive credit for the graduate section of a course by registering for an undergraduate section, even if they are cross-listed. Similarly, registering for the outside of ECE course section of a cross-list will not allow you to count it towards your ECE core, even if the course is cross-listed.

## Final Exams

All ECE students must attend final exams as scheduled by the university and individual course instructors. If a student believes that a final exam presents a scheduling conflict, they must discuss the issue with the course instructor. The ECE administration does not have control over the university exam schedule. Please keep this in mind when arranging travel at the end of a semester; having purchased airline tickets is not a proper excuse for missing a final exam. Please refer to Carnegie Mellon University Policies on Examinations for additional information: <https://www.cmu.edu/policies/student-and-student-life/examination-policies.html>

## Research Assistant & Teaching Assistant Positions

### Research Assistant for Credit

See the Research for Credit section for more information about receiving academic credit for research.

## Research Assistant for Pay

Students are permitted to pursue research opportunities for pay in any department. Students should contact faculty members individually to inquire about opportunities available and provide information on their background. The supervising faculty can provide further information about payroll procedures.

## Teaching Assistant Positions

There are several levels of teaching assistant opportunities available for ECE students. For complete information please visit the Teaching Opportunities website: <https://www.ece.cmu.edu/insider/teaching-opportunities.html>

## Employment Eligibility Verification

**“If you are receiving a stipend, are a TA or are you planning to have a position with CMU then Employment Eligibility Verification is Required”**

The I-9 form 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.](#)”

## Evaluation and Certification of English Fluency for Instructors

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. For more information about requirements, see Evaluation & Certification of English Fluency for Instructors in the University Policies of this handbook.

## 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.

## Enrollment Verifications

The Hub is the primary contact for students or alumni who would like to request a transcript, enrollment verification, or other information related to their time in ECE. Please see their website for more information: <https://www.cmu.edu/hub/registrar/student-records/verifications/>

ECE may verify some limited information in the form of a letter, which may be suitable for some purposes, such as the verification of skills students acquired through the ECE programs. Please contact your academic advisor for more information. Please note that the ECE department is only able to verify information on ECE (18-xxx) and Computer Science (15-xxx) courses. Information on courses offered in other departments can only be verified by those departments. To obtain a verification, the student or alumni should contact the Graduate Affairs office.

## Leave of Absence

Occasionally, students must pause their degree program due to personal, professional, or academic reasons. A student who is considering a leave of absence should speak to their academic advisor prior to taking a leave of absence in order to ensure their understanding of the leave of absence policy and its ramifications.

Leaves of absences are capped at 2 calendar years total throughout the MS program. In extreme cases, a student may request additional leave time via a petition to the GSC.

If they do not return within two academic years, they will be administratively withdrawn from the graduate program. IMB students who have declared their graduate degree but left CMU after completing their BS degree before having graduate status must also abide by this policy. Anyone who is intending to return to the program outside of the 2-year leave (including CMU graduates with ECE BS degrees who have not declared their IMB prior to graduation) must reapply to the graduate program. The University Process for taking a Leave of Absence can also be found at <https://www.cmu.edu/hub/registrar/leaves-and-withdrawals/>.

Once a student decides to take a leave of absence, they should complete the Leave of Absence form (<https://www.cmu.edu/hub/docs/loa.pdf>) and bring it to their academic advisor for additional processing.

## Returning from a Leave of Absence

A student intending to return from leave must submit the Petition to Return from Leave of Absence form (<https://www.cmu.edu/hub/docs/return-loa.pdf>) to their academic advisor at least 30 days prior to the start of the semester in which they plan to return. A student's return must coincide with the start of a new semester (fall, spring, or summer). Students cannot return from a leave of absence in mid-semester, with the exception of summers.

Per the university policy on student leaves, "Students on leave are not permitted to live in university housing, attend classes, or maintain employment as students at Carnegie Mellon while

their leave is in effect” (<https://www.cmu.edu/policies/student-and-student-life/student-leave.html>).

More information about the University’s Leave of Absence and Withdrawal policies can be found at <https://www.cmu.edu/hub/registrar/leaves-and-withdrawals/>.

## Degree Certification Process & Commencement

A student must satisfy all degree requirements and achieve a minimum of 3.0 QPA in the courses applied towards the required 97 or 133 units (depending on program) to be eligible for degree certification. In addition, students must have provided a final copy of their undergraduate transcript(s) and must have a tuition balance of \$0.00 to receive a diploma.

Once a student completes their degree requirements, their degree must be certified. Certification will occur regardless of whether or not a student has taken their maximum allowed units.

Carnegie Mellon commencement only occurs at the end of spring semester. ECE holds a diploma ceremony at the end of spring semester as well. Students who are certified in the summer or fall semesters are invited to attend the next commencement ceremony. Spring graduates are invited to the spring commencement ceremony.

Before graduation, students should update their contact information, such as mailing address and e-mail address, within SIO. Also, students should review a proxy of their diploma in SIO to verify the information displayed there, such as the spelling of their name.

The title of the degree students receive is Master of Science in Electrical and Computer Engineering.

## ACADEMIC STANDARDS

### Grades

#### University Policy on Grades

The university policy on grading offers details concerning university grading principles for students taking courses and covers the specifics of assigning and changing grades, grading options, drops/withdrawals, and course repeats. It also defines the undergraduate and graduate grading standards. See the full policy here: <https://www.cmu.edu/policies/student-and-student-life/grading.html>

#### CIT Grading Policy

ECE follows the CIT letter grade scale. The letter grade scale is ‘A’ (highest for CIT students), ‘A-’, ‘B+’, ‘B’, ‘B-’, ‘C+’, ‘C’, ‘C-’, ‘D+’, ‘D’, and ‘R’ (lowest). CIT students cannot receive an ‘A+’ grade on their transcript, even if a course is taken from another college where ‘A+’ is given. Grades lower than ‘C’, meaning C- or below, are considered failure in CIT and will not count toward degree requirements. For more information, please see CIT’s website:

<https://engineering.cmu.edu/education/academic-policies/graduate-policies/registration-grading-credit.html>

## Incomplete Grade

Incomplete grades will be assigned at the discretion of the course instructor, per the university grading policy: <https://www.cmu.edu/policies/student-and-student-life/grading.html>

## Process for Appealing Final Grades

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. Visit the following link for more information:

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

## Policy on Grades for Transfer Courses

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

## Withdrawal Grade/Withdrawing from Courses

Students can withdraw from a course after the add/drop deadline until the course withdrawal deadline. This will result in a 'W' on the transcript, which is not factored into the QPA. To withdraw, the course withdrawal request form (<https://www.cmu.edu/hub/docs/course-withdrawal.pdf>) must be completed and submitted to the academic advisor for approval. If approved, the academic advisor will send the form to the HUB for processing.

Process for 'Withdrawal' from Program. University process can be found at:

<https://www.cmu.edu/hub/registrar/leaves-and-withdrawals/>

## Academic Performance

### Quality Point Average

In order to graduate, each student must have a Quality Point Average (QPA) of at least 3.0 in the courses being used towards the required 97 or 133 units (depending on program). Coursework or graduate project units with a grade lower than 'C' will not be considered toward graduate degree requirements. However, they will be calculated into the student's cumulative QPA.

### Academic Probation

In the event that a student's semester or cumulative QPA falls below a 3.0, that student is on academic probation and will receive a letter from the department alerting them. While on probation, students must meet with their academic advisor and comply with their recommendations. Once a student's semester and cumulative QPA increase above 3.0, the student is automatically removed from probation.

## Academic Integrity

Please review the University Policy on Academic Integrity (<https://www.cmu.edu/policies/student-and-student-life/academic-integrity.html>). The policy includes the University expectations around academic integrity and provides definitions of cheating, plagiarism, and unauthorized assistance.

A review of the University's Academic Disciplinary Actions procedures (<https://www.cmu.edu/student-affairs/theword/academic-discipline/index.html>) is also recommended. These procedures outline the process for investigating, reporting, and adjudicating violations of the University Policy on Academic Integrity. The procedures also outline the appeal process.

### Penalties for Violating Academic Integrity

Should an instructor believe that an academic integrity violation has occurred, they may consult with the Office of **Community Standards & Integrity**, who will assist the faculty member in handling a possible academic integrity violation and, if a student is found responsible for violating academic integrity policies, determining possible sanctions. In accordance with the university's policy, a student who violates the academic integrity policy will not be permitted to drop the course in which the offense occurred in order to avoid penalty. If the student attempts to drop the course, they will be reenrolled.

Multiple academic integrity violations may result in a student's dismissal from the MS ECE program. For more information on the policies and procedures surrounding academic integrity, please see the website for the **Office of Community Standards & Integrity**.

### Disciplinary Probation

Students who have committed an academic integrity violation are placed on disciplinary probation within the department for the remainder of their academic program. While on probation, students are allowed to continue with the program but must meet with their academic advisor.

## MS DEGREE REQUIREMENTS

### Spring 2020 and prior

This section outlines the degree requirements for all students who entered the **Master of Science in Electrical & Computer Engineering** program in Spring 2020 or prior in the Pittsburgh and CMU-Africa locations. ECE course list and course descriptions are available on the ECE course website: <https://courses.ece.cmu.edu>.

#### MS in Electrical & Computer Engineering

##### ***For students entering the program Fall 2018 or later:***

Each MS ECE candidate must complete 97 units (1 unit = 1 hour of work) of coursework. All incoming MS ECE students must take the one-unit Introduction to Graduate Studies course (18-989) in their first semester. Please see the **MS ECE Course Requirements** page for more details on which students must take 18-989. The remaining 96 units will be comprised of the degree requirements below.

##### ***For students entering the program Spring 2018 or earlier:***

Each student must complete 96 units (1 unit = 1 hour of work) of coursework, consisting of sections A and B below.

#### ECE Core Graduate Coursework: 60 units

The ECE program requires 60 units of core coursework that may not be waived or substituted. These courses should be in the ECE Department (18) at the 600-level or above. Additionally, courses in the Computer Science department (15), Machine Learning Department (10), and Robotics Institute (16) at the 600 level or above can be counted. For exceptions to the rule and pre-approved courses from other departments, please visit the MS ECE Course Requirements webpage: <https://www.ece.cmu.edu/academics/ms-ece/course-requirements-prior-s2020.html>

#### Electives: 36 units

Students have the opportunity to pursue a wide range of electives in which they have a special interest. Approved electives can be comprised of courses approved for core and those listed below.

##### ***Restricted Electives: 24 units***

Restricted elective courses are courses which must be from approved departments and at the graduate level. For a list of approved departments and exceptions to the rule, please visit the MS ECE Course Requirements webpage referenced above.

##### ***Less-Restricted Elective: 12 units***

Less-restricted elective courses are graduate or undergraduate level (must be xx-300 or greater) courses that may include courses from the same colleges, departments, and programs listed in

the sections above. Less-restricted electives may count for up to 12 units of the 36 units of electives. Courses numbered as xx-299 or lower will not be counted toward the MS degree.

Three units of internship (18-994 Internship for Electrical and Computer Engineering Graduate Students) or professional development (39-699 CIT Professional Development Course) coursework may also count towards the Less-Restricted Elective.

## Fall 2020 and later

This section outlines the degree requirements for all students who entered one of the four possible **Master of Science in Electrical & Computer Engineering** programs Fall 2020 or later in Pittsburgh. ECE course list and course descriptions are available on the ECE course website: <https://courses.ece.cmu.edu>.

### MS in ECE – Standard Program

The M.S. in ECE standard program is a three-semester program that is comprised of 97 units of graduate course work (600 level and above). The Standard Program has two available options detailed below. The course option is available to students at both the Pittsburgh and Silicon Valley campuses. The project option is only available to students at the Pittsburgh campus.

#### ***Course option:***

#### **ECE Core Graduate Coursework: 60 units**

The MS in ECE – Standard Program (course option) requires 60 units of core coursework that may not be waived or substituted. These courses must be in the ECE Department (18) at the 600-level or above. For exceptions to the rule, please visit the MS ECE Course Requirements webpage: <https://www.ece.cmu.edu/academics/ms-ece/standard-program.html>

\*Please note that only 12 units of MS Graduate Research Project (18-980) can be counted towards the core Graduate Coursework requirement.

#### **CIT Elective Courses: 24 units**

The MS in ECE – Standard Program (course option) requires 24 units of CIT Elective coursework that may not be waived or substituted. These courses must be in the College of Engineering (CIT) at the 600-level or above. For a list of departments within CIT and for exceptions to the rule, please visit the MS ECE Course Requirements webpage: <https://www.ece.cmu.edu/academics/ms-ece/standard-program.html>

Three units of internship (18-994 Internship for Electrical and Computer Engineering Graduate Students) or professional development (39-699 CIT Professional Development Course) coursework may also count toward CIT Electives.

### General Technical Elective Courses: 12 units

The MS in ECE – Standard Program (course option) requires 12 units of General Technical Elective coursework that may not be waived or substituted. These courses must be at the 600-level or above from the departments listed above as well as many additional departments listed on the MS ECE Course Requirements webpage: <https://www.ece.cmu.edu/academics/ms-ece/standard-program.html>

### Introduction to Graduate Studies (18-989): 1 unit

All incoming MS ECE students must take the one-unit Introduction to Graduate Studies course (18-989) in their first semester.

\*Preparatory Exception: 12 units of undergraduate course work (300 level and above) may be substituted as part of the 96 core and elective units.

### ***Project option:***

### ECE Core Graduate Coursework: 36 units

The MS in ECE – Standard Program (project option) requires 36 units of core coursework that may not be waived or substituted. These courses must be in the ECE Department (18) at the 600-level or above. For exceptions to the rule, please visit the MS ECE Course Requirements webpage: <https://www.ece.cmu.edu/academics/ms-ece/standard-program.html>

### CIT Elective Courses: 12 units

The MS in ECE – Standard Program (project option) requires 12 units of CIT Elective coursework that may not be waived or substituted. These courses must be in the College of Engineering (CIT) at the 600-level or above. For a list of departments within CIT and for exceptions to the rule, please visit the MS ECE Course Requirements webpage: <https://www.ece.cmu.edu/academics/ms-ece/standard-program.html>

Three units of internship (18-994 Internship for Electrical and Computer Engineering Graduate Students) or professional development (39-699 CIT Professional Development Course) coursework may also count towards the CIT Elective.

### **General Technical Elective Courses: 12 units**

The MS in ECE – Standard Program (project option) requires 12 units of General Technical Elective coursework that may not be waived or substituted. These courses must be at the 600-level or above from the departments listed above as well as many additional departments listed on the MS ECE Course Requirements webpage: <https://www.ece.cmu.edu/academics/ms-ece/standard-program.html>

### **ECE Research Project: 36 units**

The MS in ECE – Standard Program (project option) requires 36 units of the ECE Research project (18-980) that may not be waived or substituted.

### **Introduction to Graduate Studies (18-989): 1 unit**

All incoming MS ECE students must take the one-unit Introduction to Graduate Studies course (18-989) in their first semester.

\*Preparatory Exception: 12 units of undergraduate course work (300 level and above) may be substituted as part of the 96 core and elective units.

### **MS-AP in ECE – Applied Program**

The M.S.-AP in ECE is a three-semester program that is comprised of 97 units of graduate course work (600 level and above). The Applied Program has two available options detailed below. The course option is available to students at both the Pittsburgh and Silicon Valley campuses. The project option is only available to students at the Pittsburgh campus.

#### ***Course option:***

### **ECE Core Graduate Coursework: 60 units**

The MS-AP in ECE (course option) requires 60 units of core coursework that may not be waived or substituted. These courses must be in the ECE Department (18) at the 600-level or above. For

exceptions to the rule, please visit the MS ECE Course Requirements webpage: <https://www.ece.cmu.edu/academics/ms-ece/standard-program.html>

### **CIT Elective Courses: 24 units**

The MS-AP in ECE (course option) requires 24 units of CIT Elective coursework that may not be waived or substituted. These courses must be in the College of Engineering (CIT) at the 600-level or above. For a list of departments within CIT and for exceptions to the rule, please visit the MS ECE Course Requirements webpage: <https://www.ece.cmu.edu/academics/ms-ece/standard-program.html>

Three units of professional development (39-699 CIT Professional Development Course) coursework may also count towards the CIT Elective.

### **General Technical Elective Courses: 12 units**

The MS-AP in ECE (course option) requires 12 units of General Technical Elective coursework that may not be waived or substituted. These courses must be at the 600-level or above from the departments listed above as well as many additional departments listed on the MS ECE Course Requirements webpage: <https://www.ece.cmu.edu/academics/ms-ece/standard-program.html>

### **Introduction to Graduate Studies (18-989): 1 unit**

All incoming MS ECE students must take the one-unit Introduction to Graduate Studies course (18-989) in their first semester.

### **Required Summer Internship (18-993)**

ECE students who are in the Applied or Applied Advanced Study Program are required to participate in a summer internship. This internship can be either on or off-campus and does not need to be a paid position.

ECE will enroll all students who are pursuing the required internship for a 0-unit internship course (18-993 Internship for Electrical and Computer Engineering Graduate Students), which can be taken once throughout the student's MS ECE degree program of study and is offered only during the summer. This internship will appear on a student's transcript, though no tuition will be assessed. The work for the internship must be appropriate to the goals of the academic program.

\*Preparatory Exception: 12 units of undergraduate course work (300 level and above) may be substituted as part of the 96 core and elective units.

***Project option:***

**ECE Core Graduate Coursework: 36 units**

The MS-AP in ECE (project option) requires 36 units of core coursework that may not be waived or substituted. These courses must be in the ECE Department (18) at the 600-level or above. For exceptions to the rule, please visit the MS ECE Course Requirements webpage: <https://www.ece.cmu.edu/academics/ms-ece/standard-program.html>

**CIT Elective Courses: 12 units**

The MS-AP in ECE (project option) requires 12 units of CIT Elective coursework that may not be waived or substituted. These courses must be in the College of Engineering (CIT) at the 600-level or above. For a list of departments within CIT and for exceptions to the rule, please visit the MS ECE Course Requirements webpage: <https://www.ece.cmu.edu/academics/ms-ece/standard-program.html>

Three units of professional development (39-699 CIT Professional Development Course) coursework may also count towards CIT Electives.

**General Technical Elective Courses: 12 units**

The MS-AP in ECE (project option) requires 12 units of General Technical Elective coursework that may not be waived or substituted. These courses must be at the 600-level or above from the departments listed above as well as many additional departments listed on the MS ECE Course Requirements webpage: <https://www.ece.cmu.edu/academics/ms-ece/standard-program.html>

**ECE Research Project: 36 units**

The MS-AP in ECE (project option) requires 36 units of the ECE Research project (18-980) that may not be waived or substituted.

**Introduction to Graduate Studies (18-989): 1 unit**

All incoming MS ECE students must take the one-unit Introduction to Graduate Studies course (18-989) in their first semester.

## Required Summer Internship (18-993)

ECE students who are in the Applied or Applied Advanced Study Program are required to participate in a summer internship. This internship can be either on or off-campus and does not need to be a paid position.

ECE will enroll all students who are pursuing the required internship for a 0-unit internship course (18-993 Internship for Electrical and Computer Engineering Graduate Students), which can be taken once throughout the student's MS ECE degree program of study and is offered only during the summer. This internship will appear on a student's transcript, though no tuition will be assessed. The work for the internship must be appropriate to the goals of the academic program.

\*Preparatory Exception: 12 units of undergraduate course work (300 level and above) may be substituted as part of the 96 core and elective units.

### MS-AD in ECE – Advanced Study Program

The M.S.-AD in ECE is a four-semester program that is comprised of 133 units of graduate course work (600 level and above). The Advanced Study Program has two available options detailed below. Both options are only currently offered to students who begin their studies at the Pittsburgh campus.

#### ***Course option:***

##### **ECE Core Graduate Coursework: 60 units**

The MS-AD in ECE (course option) requires 60 units of core coursework that may not be waived or substituted. These courses must be in the ECE Department (18) at the 600-level or above. For exceptions to the rule, please visit the MS ECE Course Requirements webpage: <https://www.ece.cmu.edu/academics/ms-ece/standard-program.html>

##### **CIT Elective Courses: 36 units**

The MS-AD in ECE (course option) requires 36 units of CIT Elective coursework that may not be waived or substituted. These courses must be in the College of Engineering (CIT) at the 600-level or above. For a list of departments within CIT and for exceptions to the rule, please visit the MS ECE Course Requirements webpage: <https://www.ece.cmu.edu/academics/ms-ece/standard-program.html>

Three units of internship (18-994 Internship for Electrical and Computer Engineering Graduate Students) or professional development (39-699 CIT Professional Development Course) coursework may also count toward CIT Electives.

### General Technical Elective Courses: 36 units

The MS-AD in ECE (course option) requires 36 units of General Technical Elective coursework that may not be waived or substituted. These courses must be at the 600-level or above from the departments listed above as well as many additional departments listed on the MS ECE Course Requirements webpage: <https://www.ece.cmu.edu/academics/ms-ece/standard-program.html>

### Introduction to Graduate Studies (18-989): 1 unit

All incoming MS ECE students must take the one-unit Introduction to Graduate Studies course (18-989) in their first semester.

\*Preparatory Exception: 12 units of undergraduate course work (300 level and above) may be substituted as part of the 96 core and elective units.

### ***Project option:***

### ECE Core Graduate Coursework: 60 units

The MS-AD in ECE (project option) requires 60 units of core coursework that may not be waived or substituted. These courses must be in the ECE Department (18) at the 600-level or above. For exceptions to the rule, please visit the MS ECE Course Requirements webpage: <https://www.ece.cmu.edu/academics/ms-ece/standard-program.html>

### CIT Elective Courses: 24 units

The MS-AD in ECE (project option) requires 24 units of CIT Elective coursework that may not be waived or substituted. These courses must be in the College of Engineering (CIT) at the 600-level or above. For a list of departments within CIT and for exceptions to the rule, please visit the MS ECE Course Requirements webpage: <https://www.ece.cmu.edu/academics/ms-ece/standard-program.html>

Three units of internship (18-994 Internship for Electrical and Computer Engineering Graduate Students) or professional development (39-699 CIT Professional Development Course) coursework may also count toward CIT Electives.

### **General Technical Elective Courses: 12 units**

The MS-AD in ECE (project option) requires 12 units of General Technical Elective coursework that may not be waived or substituted. These courses must be at the 600-level or above from the departments listed above as well as many additional departments listed on the MS ECE Course Requirements webpage: <https://www.ece.cmu.edu/academics/ms-ece/standard-program.html>

### **ECE Research Project: 36 units**

The MS-AD in ECE (project option) requires 36 units of the ECE Research project (18-980) that may not be waived or substituted.

### **Introduction to Graduate Studies (18-989): 1 unit**

All incoming MS ECE students must take the one-unit Introduction to Graduate Studies course (18-989) in their first semester.

\*Preparatory Exception: 12 units of undergraduate course work (300 level and above) may be substituted as part of the 96 core and elective units.

### MS-APD in ECE – Applied Advanced Study Program

The M.S.-APD in ECE is a four-semester program that is comprised of 133 units of graduate course work (600 level and above). The Applied Advanced Study Program has two available options detailed below. Both options are only currently offered to students who begin their studies at the Pittsburgh campus.

#### ***Course option:***

### **ECE Core Graduate Coursework: 60 units**

The MS-APD in ECE (course option) requires 60 units of core coursework that may not be waived or substituted. These courses must be in the ECE Department (18) at the 600-level or above. For exceptions to the rule, please visit the MS ECE Course Requirements webpage: <https://www.ece.cmu.edu/academics/ms-ece/standard-program.html>

### CIT Elective Courses: 36 units

The MS-APD in ECE (course option) requires 36 units of CIT Elective coursework that may not be waived or substituted. These courses must be in the College of Engineering (CIT) at the 600-level or above. For a list of departments within CIT and for exceptions to the rule, please visit the MS ECE Course Requirements webpage: <https://www.ece.cmu.edu/academics/ms-ece/standard-program.html>

Three units of professional development (39-699 CIT Professional Development Course) coursework may also count toward CIT Electives.

### General Technical Elective Courses: 36 units

The MS-APD in ECE (course option) requires 12 units of General Technical Elective coursework that may not be waived or substituted. These courses must be at the 600-level or above from the departments listed above as well as many additional departments listed on the MS ECE Course Requirements webpage: <https://www.ece.cmu.edu/academics/ms-ece/standard-program.html>

### Introduction to Graduate Studies (18-989): 1 unit

All incoming MS ECE students must take the one-unit Introduction to Graduate Studies course (18-989) in their first semester.

### Required Summer Internship (18-993)

ECE students who are in the Applied or Applied Advanced Study Program are required to participate in a summer internship. This internship can be either on or off-campus and does not need to be a paid position.

ECE will enroll all students who are pursuing the required internship for a 0-unit internship course (18-993 Internship for Electrical and Computer Engineering Graduate Students), which can be taken once throughout the student's MS ECE degree program of study and is offered only during the summer. This internship will appear on a student's transcript, though no tuition will be assessed. The work for the internship must be appropriate to the goals of the academic program.

\*Preparatory Exception: 12 units of undergraduate course work (300 level and above) may be substituted as part of the 96 core and elective units.

***Project option:***

**ECE Core Graduate Coursework: 36 units**

The MS-APD in ECE (project option) requires 36 units of core coursework that may not be waived or substituted. These courses must be in the ECE Department (18) at the 600-level or above. For exceptions to the rule, please visit the MS ECE Course Requirements webpage: <https://www.ece.cmu.edu/academics/ms-ece/standard-program.html>

**CIT Elective Courses: 12 units**

The MS-APD in ECE (project option) requires 12 units of CIT Elective coursework that may not be waived or substituted. These courses must be in the College of Engineering (CIT) at the 600-level or above. For a list of departments within CIT and for exceptions to the rule, please visit the MS ECE Course Requirements webpage: <https://www.ece.cmu.edu/academics/ms-ece/standard-program.html>

Three units of professional development (39-699 CIT Professional Development Course) coursework may also count toward CIT Electives.

**General Technical Elective Courses: 12 units**

The MS-APD in ECE (project option) requires 12 units of General Technical Elective coursework that may not be waived or substituted. These courses must be at the 600-level or above from the departments listed above as well as many additional departments listed on the MS ECE Course Requirements webpage: <https://www.ece.cmu.edu/academics/ms-ece/standard-program.html>

**ECE Research Project: 36 units**

The MS-APD in ECE (project option) requires 36 units of the ECE Research project (18-980) that may not be waived or substituted.

**Introduction to Graduate Studies (18-989): 1 unit**

All incoming MS ECE students must take the one-unit Introduction to Graduate Studies course (18-989) in their first semester.

**Required Summer Internship (18-993)**

ECE students who are in the Applied or Applied Advanced Study Program are required to participate in a summer internship. This internship can be either on or off-campus and does not need to be a paid position.

ECE will enroll all students who are pursuing the required internship for a 0-unit internship course (18-993 Internship for Electrical and Computer Engineering Graduate Students), which can be taken once throughout the student's MS ECE degree program of study and is offered only during the summer. This internship will appear on a student's transcript, though no tuition will be assessed. The work for the internship must be appropriate to the goals of the academic program.

\*Preparatory Exception: 12 units of undergraduate course work (300 level and above) may be substituted as part of the 96 core and elective units.

## MS Concentrations

In addition to meeting the degree requirements, students may also declare a concentration. For more information about the available concentrations, see the section on MS Concentrations.

## Integrated Master's/Bachelor's Program

As students who are in the IMB program are pursuing the same degree as those in our professional Master's program, they are required to adhere to the same requirements as other Professional MS students. This includes MS degree requirements, university policies, and CIT policies.

## Course Restrictions

Courses where more than 50% of the course grade is based on a group project or more than 20% is based on attendance cannot be used towards the required units for any MS program in the department of Electrical and Computer Engineering. Mini courses worth 12 units cannot be used towards the required units. Students are responsible for checking the syllabi for classes to ensure their courses meet these requirements. For a complete list of all course restrictions, please visit our website: <http://www.ece.cmu.edu/programs-admissions/masters/ms-requirements.html>

For restrictions on the number of units taken outside the College of Engineering, see the section on Maximum Units Allowed Outside CIT.

## Internship Course Option

ECE students who are not in the Applied or Applied Advanced Study Program may wish to participate in optional paid internships at off-campus organizations during the summer months.

ECE will enroll all students who are pursuing an optional internship for a 3-unit credit bearing internship course (18-994 Internship for Electrical and Computer Engineering Graduate Students), which can be taken once throughout the student's MS ECE degree program of study, and is offered only during the summer. This internship will appear on a student's transcript and tuition will be charged for 3 units. Please see details for CIT cost of attendance on [HUB's website](#). The work for the internship must be appropriate to the goals of the academic program and units

can be applied to the less restricted elective requirement (for Spring 2020 students and prior) or the General Technical Elective requirement (for Fall 2020 students and later).

Eligible international students who are interested in pursuing off-campus internships must meet with departmental and OIE representatives. For additional information, please refer to OIE's website on [Employment Options](#) for international students. Academic and OIE advisors will provide students with information about CPT during the spring semester.

## POST-MATRICULATION GUIDELINES

### Return of University Property

ECE students must return all borrowed ECE and university materials—such as software, manuals, library books/materials, or any other Carnegie Mellon University property—prior to their departure from the program.

### Career Services Employment Outcomes

ECE students are asked to complete and return a survey for Career Services updating CMU on their employment outcomes after graduation. Information about the survey is communicated in the students' final semester.

### “Grandfather” Clause

When policies are changed, it is because the department believes the new rules offer an improvement; any such changes will be communicated to students. In case degree requirements are changed and certain courses are no longer offered, the department will try to find some compromise that allows those students to satisfy the original requirements.

## TUITION AND FEES

As indicated in your admission offer letter, ECE does not offer financial assistance for our master's students. Unless otherwise arranged and approved in advance, ECE students are full-time and will be charged full-time [CIT tuition](#). Total charges for a period of attendance and estimated schedule of total charges for entire educational program can be found at the following website: <https://www.cmu.edu/sfs/tuition/graduate/cit.html>

### Tuition Billing & Payments

The tuition rate for students entering ECE programs is set in the spring for the class entering in the following fall semester. Tuition for a student's second fall semester will likely increase in accordance with the tuition increase for the new academic year. The tuition will increase approximately 3% per year.

Students will be charged tuition per semester for each semester in which they are enrolled. Summer courses, if taken, are charged additional tuition. The tuition billing and payment process for all ECE students is handled centrally by The HUB. For university billing and payment policies, please refer to The HUB's [Billing and Payments website](#).

## Part-Time Students

Part-time students will be charged tuition at the per unit rate. Arranging to pay per unit is a convenience and not intended to reduce the overall costs of the program. Be sure that if you intend to be enrolled as a part-time student, your schedule reflects this by the tenth day of classes.

If you are planning to pursue part-time coursework (< 36 units), if you register full-time (> 35 units) at any point in that semester, you will be assessed the full-time tuition rate and no refund will be granted. If you are pursuing part-time coursework, be sure to consult with your academic advisor before changing your course schedule.

## University Financial Aid

Graduate students should consult the graduate student financial aid information found on The HUB website: <https://www.cmu.edu/sfs/financial-aid/graduate/index.html>. Students will find the Graduate Financial Aid Guide, information about funding options and how to apply for financial aid and other helpful links.

Graduate students who find themselves in need of immediate funds for emergency situations should contact the Office of the Dean of Student Affairs (see Appendix A), <https://www.cmu.edu/student-affairs/index.html>, to inquire about an Emergency Student Loan.

## Student Financial Obligation

ECE students are subject to and must be aware of the Carnegie Mellon [policy regarding student financial obligation](#).

## CAREER SERVICES

The [Career and Professional Development Services Center](#) (CPDC) serves to provide students with guidance during their job and internship searches. The services available to students include resume reviews, mock interviewing, salary negotiation, career exploration consultation, internship and job consultation, workshops/events, and employer relations. The CPDC is also heavily involved in organizing campus-wide job fairs and bringing employers to campus.

Handshake is Carnegie Mellon's online recruiting system. Through Handshake, employers can request accounts to post jobs, request interviews and information sessions, and review student resumes. Students and alumni can apply to positions, sign up for interviews, and find contact information for thousands of recruiters. Handshake can be accessed through the CPDC website.

## Career Consultants

ECE has an assigned career consultant who provides guidance through one-on-one appointments. Students in Pittsburgh can meet with [Marcie Foy](#). Appointments with Marcie can

be made through Handshake. She will also hold open office hours, which will be communicated at the beginning of each semester.

## Job Search Guidelines

ECE strives to play a supportive role in the career pursuits of students, but maintains academics as a priority. It is not acceptable for students to skip classes or assignments in order to attend job interviews. Students should conduct job searches in a manner that does not impede the academic progress through their graduate program.

It is also important for students to understand how to conduct a job search. When applying for jobs, students are expected to exhibit certain ethical behavior, such as arriving on time for interviews, being truthful about their qualifications, and to honor their agreements with recruiters. Further, students should not continue looking and interviewing for a position after they have accepted an offer.

The CPDC reserves the right to limit access for any users that do not follow their [ethical job/internship search policy](#). Students who do not follow such guidelines may forfeit their on-campus interviewing and/or resume submission privileges.

## CMU First Destination Outcomes

Post-Graduation Salaries and Destination Information can be found at the following link:

<https://www.cmu.edu/career/about-us/salaries-and-destinations/post-grad-dashboard.html>

## Employment with ECE Department

Eligible international students who qualify for pre- or post-completion Optional Practical Training (OPT) work authorization should note that the ECE department (as an employer) does not offer unpaid positions for OPT work authorization. While off-campus employment or volunteer opportunities under OPT work authorization do not have to be paid positions, ECE will only offer paid positions to eligible students.

## UNIVERSITY POLICIES

### Academic Integrity

Students at Carnegie Mellon are engaged in intellectual activity consistent with the highest standards of the academy. The relationship between students and instructors and their shared commitment to overarching standards of respect, honor, and transparency determine the integrity of our community of scholars. The actions of our students, faculty, and staff are a representation of our university community and of the professional and personal communities that we lead. Therefore, a deep and abiding commitment to academic integrity is fundamental to a Carnegie Mellon education. For more information on these standards, please visit the link below: <http://www.cmu.edu/policies/student-and-student-life/academic-integrity.html>

## Assistance for Individuals with Disabilities

The Office of Disability Resources at Carnegie Mellon University (<http://www.cmu.edu/disability-resources/>) 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 or email [access@andrew.cmu.edu](mailto: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](mailto:access@andrew.cmu.edu) or call (412) 268-6121.

## Evaluation & Certification of English Fluency for Instructors

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. Teaching Assistant English Fluency is managed through the International Teaching Assistant testing process administered by CMU's Language Support in the Student Academic Success Center. For details please visit the links below:

- <http://www.cmu.edu/policies/faculty/evaluation-certification-english-fluency-instructors.html>
- <https://www.cmu.edu/student-success/>

## Leave of Absence & Withdrawal Policies

“Leave of absence” means leaving the university temporarily, with the firm and stated intention to return. “Withdrawal” means leaving the university with no intention to return. Withdrawals or leaves taken on or before the university deadline to drop classes without receiving a ‘W’ (withdrawal) grade will result in all courses or grades being removed. Withdrawals or leaves taken after the university deadline to drop classes but before the last day of classes will result in ‘W’ grades assigned to all classes. Withdrawals or leaves taken after the last day of classes will result in permanent grades assigned by the instructors for each class. After the last day of class, courses cannot be removed from a student’s transcript.

International students should consult with the Office of International Education (OIE) prior to taking a leave of absence or withdraw from their program.

Further information about Carnegie Mellon’s policy on student leave is available at the following link: <http://www.cmu.edu/policies/student-and-student-life/student-leave.html>

Students who would like to take a leave of absence or withdraw must complete the appropriate form at the following link: <http://www.cmu.edu/hub/forms.html>

Please see the [Leave of Absence](#) section of this handbook for ECE's policy on leave of absence and withdrawals.

## Tuition Refund Policy

If an ECE student withdraws or takes a leave of absence, the HUB will determine if a student should receive a tuition refund, as this is governed by CMU's policies, not ECE's.

Additional information is available at the following link:

<https://www.cmu.edu/sfs/tuition/adjustment/index.html>

## Returning to Carnegie Mellon

When a student plans to return to CMU after a leave of absence, he/she must complete the [Petition for Return from Leave of Absence form](#) at least one month prior to the start of the semester. We recommend doing so prior to the registration period for the upcoming semester (for Fall, April and for Spring, November). The student must also meet any conditions that were set by ECE or the university at the time of leave was granted. Further information about Carnegie Mellon's policy on student return is available at the following link:

<https://www.cmu.edu/hub/docs/return-loa.pdf>

## Retention of Student Records

Carnegie Mellon University has an official policy on the retention of student records.

Please visit this website for the University's policy: <https://www.cmu.edu/es/docs/record-retention-policy.pdf>

## Safeguarding Educational Equity – Sexual Harassment and Sexual Assault Policy

The University prohibits sex-based discrimination, sexual harassment, sexual assault, dating/domestic violence and stalking. 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 of Title IX Initiatives, <https://www.cmu.edu/title-ix/> 412-268-7125, [tix@cmu.edu](mailto:tix@cmu.edu)
- University Police, 412-268-2323

Additional resources and information can be found at: <https://www.cmu.edu/title-ix/resources-and-information/resources.html>.

## 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.

### **Maternity Accommodation Protocol**

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

Students whose anticipated delivery date is during the course of the semester may consider taking time away from their coursework and/or research responsibilities. All female students who give birth to a child while engaged in coursework or research are eligible to take either a short-term absence or formal leave of absence. Students in course work should consider either working with their course instructor to receive incomplete grades, or elect to drop to part-time status or to take a semester leave of absence. Students engaged in research must work with their faculty to develop plans for the research for the time they are away.

Students are encouraged to consult with relevant university faculty and staff as soon as possible as they begin making plans regarding time away. Students must contact the Office of the Dean of Student Affairs to register for Maternity Accommodations. Students will complete an information form and meet with a member of the Dean's Office staff to determine resources and procedures appropriate for the individual student. Planning for the student's discussion with her academic contact(s) (advisor, associate dean, etc.) may be reviewed during this meeting.

### **Suspension/Required Withdrawal Policy**

University suspension is a forced, temporary leave from the university. A student may be suspended for academic, disciplinary, or administrative reasons. Additional information is available at the following link: <http://www.cmu.edu/policies/student-and-student-life/suspension-required-withdrawal-policy.html>

### **Withdrawal of a Degree**

The university reserves the right to withdraw a degree even though it has been granted should there be discovery granted that the work which it was based on or the academic records in support of it had been falsified. The complete reference to this university policy is available at <http://www.cmu.edu/policies/student-and-student-life/withdrawal-of-a-degree.html>

### **Withdrawal from Program**

Students are able to withdraw from the department at any time. Prior to withdrawing, students should discuss their decision with their faculty advisor(s) and the Graduate Affairs Office. Students will be required to fill out the [Withdrawal form](#) located on The Hub website. International students must consult with OIE prior to filing a withdrawal form as there will be visa repercussions.

## University Grievances

Students are encouraged to discuss any concerns or grievances informally within ECE. If a student is not satisfied with the results of informal discussion or formal appeal at the department level, they may follow the guidelines on Graduate Student Appeal and Grievance Procedures. Students are likewise encouraged to speak directly to their graduate student's representatives and to the president of the Graduate Student Assembly (GSA).

### **Summary of Graduate Student Appeal and Grievance Procedures**

Graduate students will find the Summary of Graduate Student Appeal and Grievance Procedures on the Graduate Education Resource webpage. This document summarizes processes available to graduate students who seek review of academic and non-academic issues. Generally, graduate students are expected to seek informal resolution of all concerns within the applicable department, unit, or program before invoking formal processes. When an informal resolution cannot be reached, however, a graduate student who seeks further review of the matter is to follow the formal procedures outlined here. These appeal and grievance procedures shall apply to students in all graduate programs of the University. Students should refer to the department specific information in this handbook for department and college information about the administration and academic policies of the program.

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

## Student Maternity Accommodation Protocol

Female students seeking Maternity Accommodations should visit the following link from the Graduate Education's website: <http://www.cmu.edu/graduate/programs-services/maternity-accommodation-protocol.html>

## Verification of Employment

Carnegie Mellon University employees or former employees are required to use Employment Verification Request Form to request employment verification. Vendors, such as mortgage companies, may continue to use standard formats with a signed authorization. Details and forms are available at <https://www.cmu.edu/hr/resources/hr-partners/hr-services/>.

# Appendix A

2020-2021

## Highlighted University Resources for Graduate Students and The WORD, Student Handbook

### Key Offices for Graduate Student Support

#### Graduate Education Office

[www.cmu.edu/graduate](http://www.cmu.edu/graduate); [grad-ed@cmu.edu](mailto:grad-ed@cmu.edu)

The Graduate Education Office provides central support for all Master's and Doctoral students with a focus on their academic experience at Carnegie Mellon. The Graduate Education Office serves as a hub for connecting graduate students to relevant campus experts and resources to support their academic success, understanding of university level policies and practices, and to assist them in advancing their personal and professional development.

Examples of resources offered through the Graduate Education Office include, but are not limited to:

- Website with university resources, contact information for CMU programs and services, calendar of events related to graduate students
- Bi-monthly email to all graduate students with information on activities, resources, and opportunities
- Professional Development Seminars and Workshops
- GSA/Provost Conference Funding Grants
- GSA/Provost Small Research Grants (GuSH)
- Consultations on issues related to the graduate student experience

The Graduate Education Office also works with the colleges and departments by informing and assisting in developing policy and procedures relevant to graduate students and working with departments on issues related to graduate students. Additionally, we partner with many other offices and organizations, such as the Graduate Student Assembly, to support the holistic graduate student educational experience.

#### 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. Vice President of Student Affairs and Dean of Students Gina Casalegno leads the Division of Student Affairs which includes the offices and departments listed below (not an exhaustive list).

Graduate students will find the enrollment information for [Domestic Partner Registration and](#)

**Maternity Accommodations** in the Office of the Dean of Students or on their **website**. This Office also manages the **Emergency Student Loan (ESLs)** process. Emergency Student Loans are made available through generous gifts of alumni and friends of the university. The Emergency Student Loan is an interest-free, emergency-based loan repayable to the university within 30 days. Loans are available to enrolled students for academic supplies, medication, food or other expenses not able to be met due to unforeseeable circumstances.

Additional resources for graduate students include **College Liaisons** and the **Student Support Resources** team. **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 student SIO page in the Important Contacts list. The Student Support Resources team offers an additional level of support for students who are navigating any of 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.

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**

### **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)
- Transgender and non-binary student programs

### **Assistance for Individuals with Disabilities**

<http://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. 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](#) or email [access@andrew.cmu.edu](mailto: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](mailto:access@andrew.cmu.edu), or call (412) 268-6121.

### **Eberly Center for Teaching Excellence & Educational Innovation**

[www.cmu.edu/teaching](http://www.cmu.edu/teaching)

We offer 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, our 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 [www.cmu.edu/teaching/graduatestudentsupport/index.html](http://www.cmu.edu/teaching/graduatestudentsupport/index.html).

### **Graduate Student Assembly**

[www.cmu.edu/stugov/gsa/index.html](http://www.cmu.edu/stugov/gsa/index.html)

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. Our recent accomplishments are a testament to GSA making a difference. Steps to implementing the vision laid out by the strategic plan are laid out at the following link: <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 3<sup>rd</sup> floor of the Cohon University Center, which is a great place to study or meet up with friends. GSA also maintains a website of graduate student resources on and off-campus. Through GSA's continued funding for professional development and research conferences, the GSA/Provost Conference Funding Program and GSA/Provost GuSH Research Grants are able to run as managed by the Graduate Education Office. As we move forward, GSA will continue to rely on your feedback to improve the graduate student experience at CMU. Feel free to contact us at [gsa@cmu.edu](mailto:gsa@cmu.edu) to get involved, stop by our office in the Cohon University Center Room 304, or become a representative for your department.

### **Office of International Education (OIE)**

<http://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 and advisement. 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.

### **Veterans and Military Community**

<http://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 resources in the Pittsburgh community. The ROTC and Veteran Affairs Coordinator can be reached at [uro-vaedbenefits@andrew.cmu.edu](mailto:uro-vaedbenefits@andrew.cmu.edu) or 412-268-8747.

### **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 relating to areas below:

- Academic and Student Life
- Bias Reporting
- Environmental Health and Safety
- Financial Matters
- High-Risk Incident
- Human Resource Related
- Information Systems
- Research
- Threat of Business Interruption
- Threat of Violence or Physical Harm
- Title IX

Students, faculty, and staff can anonymously file a report by calling 877-700-7050 or visiting [www.reportit.net](http://www.reportit.net) (user name: tartans; password: plaid). All submissions are reported to appropriate university personnel.

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

### **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>

## **Key Offices for Academic & Research Support**

### **Computing and Information Resources**

[www.cmu.edu/computing](http://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 [it-help@cmu.edu](mailto:it-help@cmu.edu).

### **Student Academic Success Center**

<https://www.cmu.edu/student-success/>  
Student Academic Support Programs

### ***Tartan Scholars***

- The Tartan Scholars program was created to provide support for limited resourced students through an intentional first year undergraduate experience with the goals of enhancing the cohort’s skill and community building through a lens of self-authorship, growth mindset, and a sense of belonging. As part of the Student Academic Success Center, Tartan Scholars are invited to join the University and participate in summer initiatives and pre-orientation activities prior to their first year at the University.
- There are opportunities for graduate students to serve as accountability, learning, or development partners, workshop facilitators, and presenters. Contact Diane Hightower at [ddhighto@andrew.cmu.edu](mailto:ddhighto@andrew.cmu.edu) for more details.

### ***Learning Support***

- **Supplemental Instruction:** Supplemental Instruction (SI) is an academic support model that utilizes peer-assisted study sessions. The SI program provides regularly scheduled review sessions on course materials outside the classroom. SI is a non-remedial approach to learning as the program targets high-risk courses and is available in select courses based on data related to past student performance and feasibility.
- **Peer Tutoring:** Weekly Tutoring Appointments are offered in a one-on-one and small group format to students from any discipline who need assistance with a course that may not be supported by our other services. Weekly appointments give students the opportunity to interact regularly with the same tutor to facilitate deeper understanding of concepts. Students can register online through the Student Academic Success website.
- **Academic Coaching:** Academic Coaching provides holistic one-on-one peer support and group workshops to help students find and implement their conditions for success. We assist students in improving time management, productive habits, organization, stress management, and study skills. Students will request support through the Academic Success Center website and attend in-person meetings or meet using video and audio conferencing technology to provide all students with support.
- **“Just in Time” Workshops:** The Student Academic Success team is available to partner with instructors and departments to identify skills or concepts that would benefit from

supplemental offerings (workshops, boot camps) to support students' academic success and learning. We are eager to help convene and coordinate outside of the classroom skill-building opportunities that can be open to any student interested in building skill or reinforcing course concept mastery.

- **Study Partners:** Support for students to create and benefit from their own study groups. The Student Academic Success team assists students in forming and benefiting from peer study groups, whereby all students can reap the benefits of peer-to-peer learning, student agency, and collaboration skill development. Staff from the Student Academic Success Center will be made available to instructors and students to assist with the formation of peer-led study groups. This level of support is open to any course where the instructor requests or agrees such support is appropriate and students are interested in both leading and participating.

### ***Language and Cross-cultural Support***

More than 60% of graduate students at Carnegie Mellon are international students, and others are nonnative speakers of English who have attended high school or undergraduate programs in the US. Many of these students want to hone their language and cross-cultural skills for academic and professional success. Students can choose from sessions on

- how to give a strong presentation
- writing academic emails
- expectations and strategies for clear academic writing
- how to talk about yourself as a professional in the U.S.
- developing clearer pronunciation
- using accurate grammar
- building fluency, and more
- Students can make an appointment with a Language Development Specialist to get individualized coaching on language or cross-cultural issues.

The Student Academic Success Center is also charged with certifying the language of International Teaching Assistants (ITAs), ensuring that non-native English speakers have the language proficiency needed to succeed as teaching assistants in the Carnegie Mellon classroom. Students preparing to do an ITA Certification should plan to take classes offered by the language support team at the SASC from the beginning of their first semester. Start by contacting the language support team at the SASC website or attend a Language Support Orientation at the SASC or in your department.

### **University Libraries**

[www.library.cmu.edu](http://www.library.cmu.edu)

The University Libraries offers a wide range of information resources and services supporting graduate students in course-work, 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, and 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.

### **Research at CMU**

[www.cmu.edu/research/index.shtml](http://www.cmu.edu/research/index.shtml)

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 is found by visiting the Research at Carnegie Mellon website.

### **Office of Research Integrity & Compliance**

[www.cmu.edu/research-compliance/index.html](http://www.cmu.edu/research-compliance/index.html)

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 and use. ORIC also provides consultation, advice, and review of allegations of research misconduct.

### **Key Offices for Health, Wellness, and Safety**

#### **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.

#### **Health Services**

[www.cmu.edu/HealthServices/](http://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 and 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 at 412-268-2157.

### **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. The BeWell@CMU e-newsletter seeks to be a comprehensive resource for CMU regarding all wellness-inspired events, announcements, and professional and personal development opportunities. Sign up for the Be Well monthly newsletter via <https://bit.ly/BeWellNewsletter> or by contacting the Program Director for Student Affairs Wellness Initiatives, at [alusk@andrew.cmu.edu](mailto:alusk@andrew.cmu.edu).

### **Religious and Spiritual Life Initiatives (RSLI)**

[www.cmu.edu/student-affairs/spirituality](http://www.cmu.edu/student-affairs/spirituality)

Carnegie Mellon is committed to the holistic growth of our students, including creating opportunities for spiritual and religious practice and exploration. We have relationships with local houses of worship from various traditions and many of these groups are members of CMU's Council of Religious Advisors. We 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. Our RSLI staff are here 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.

### **University Police**

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

412-268-2323 (emergency only), 412-268-6232 (non-emergency)

The University Police Department is located at 300 South Craig Street (entrance is on 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, finger print 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 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. Graduate students can obtain a copy by contacting the University Police Department at 412-268-6232. The annual security and fire safety report is also available online at <https://www.cmu.edu/police/annualreports/>.

### **Shuttle and Escort Services**

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

### **The WORD**

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

The WORD is Carnegie Mellon University's student on-line handbook and is considered a supplement to the department (and sometimes college) handbook. The WORD contains campus resources and opportunities, academic policy information and resources, community standards information, and resources. 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. Information about the following is included in The WORD (not an exhaustive list) and graduate students are encouraged to bookmark this site and refer to it often. University policies can also be found in full text at <http://www.cmu.edu/policies/>.

Carnegie Mellon Vision, Mission  
Statement of Assurance  
Carnegie Code

Academic Standards, Policies and Procedures

- Educational Goals
- Academic and Individual Freedom
- Statement on Academic Integrity Standards for Academic & Creative Life
- Assistance for Individuals with Disabilities
- Master's Student Statute of Limitations
- Conduct of Classes
- Copyright Policy

- Cross-college & University Registration
- Doctoral Student Status Policy
- Evaluation & Certification of English Fluency for Instructors
- Final Exams for Graduate Courses
- Grading Policies
- Intellectual Property Policy
- Privacy Rights of Students
- Student's Rights

#### Research

- Human Subjects in Research
- Office of Research Integrity & Compliance
- Office of Sponsored Programs
- Policy for Handling Alleged Misconduct of Research
- Policy on Restricted Research

#### Tax Status of Graduate Student Awards

#### Campus Resources & Opportunities

- Alumni Relations
- Assistance for Individuals with Disabilities
- Athletics, Physical Fitness & Recreation
- Carnegie Mellon ID Cards and Services
- Cohon University Center
- Copying, Printing & Mailing
- Division of Student Affairs
- Domestic Partner Registration
- Emergency Student Loan Program
- Gender Programs & Resources
- Health Services
- Dining Services
- The HUB Student Services Center
- ID Card Services
- Leonard Gelfand Center
- LGBTQ Resources
- Multicultural and Diversity Initiatives
- Opportunities for Involvement
- Parking and Transportation Services
- Shuttle and Escort Services
- Spiritual Development
- University Police
- Student Activities
- University Stores

## Community Standards, Policies, and Procedures

- Alcohol and Drugs Policy
- AIDS Policy
- Bicycle/Wheeled Transportation Policy
- Damage to Carnegie Mellon Property
- Deadly Weapons
- Discriminatory Harassment
- Disorderly Conduct
- Equal Opportunity/Affirmative Action Policy
- Freedom of Expression Policy
- Health Insurance Policy Immunization Policy
- Missing Student Protocol
- Non-Discrimination Policy
- On-Campus Emergencies
- Pets
- Political Activities
- Recycling Policy
- Riotous and Disorderly Behavior
- Safety Hazards
- Scheduling and Use of University Facilities
- Sexual Harassment and Sexual Assault Policy
- Smoking Policy
- Student Accounts Receivable and Collection Policy and Procedures
- Student Activities Fee
- Student Enterprises
- Workplace Threats and Violence Policy

## **COVID-19 Related Updates**

**Pass/No Pass Policy** – In response to the ongoing COVID-19 pandemic, the Provost's Office and Senior Leadership have created a temporary modification to the grading policy for spring 2020. These changes are for the spring 2020 semester only and were made due to the impact of COVID-19. All undergraduate and graduate students are permitted to convert any spring 2020 semester-length or mini-4 course final grade to pass/no pass during the Special Pass/No Pass Election Period.

**Remote Courses** – Due to the COVID-19 pandemic, the policy permitting only one online class per semester is suspended for the 2020-2021 academic year. Students may register for classes that have both remote and in-person delivery modes.

**Program Changes** – Fall 2020 students are not required to elect their new program until after the semester begins.



5000 Forbes Avenue

Pittsburgh, PA 15213

[www.ece.cmu.edu](http://www.ece.cmu.edu)

[@CMU\\_ECE](https://twitter.com/CMU_ECE)