



Electrical & Computer  
**ENGINEERING**



Electrical & Computer Engineering

**2018-2019 M.S. Catalog/Handbook**

ECE Office of Graduate Affairs

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

Carnegie Mellon University – Silicon Valley  
NASA Ames Research Park  
Bldg. 23 (MS 23-11)  
P.O. Box 1  
Moffett Field, CA 94035-0001  
(650) 603-7032  
[www.cmu.edu/silicon-valley](http://www.cmu.edu/silicon-valley)

## TABLE OF CONTENTS

<b>WELCOME TO ELECTRICAL AND COMPUTER ENGINEERING</b>	<b>7</b>
Core Values	8
Vision	8
Mission	8
<b>INTRODUCTION</b>	<b>9</b>
Graduate Degrees and Programs Offered	9
Graduate Student Catalog/Handbook	9
<b>CARNEGIE MELLON POLICIES, EXPECTATIONS, STATEMENT OF ASSURANCE, AND CODE</b>	<b>9</b>
Carnegie Mellon Policies & Expectations	9
Carnegie Mellon Statement of Assurance	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	12
University Library	12
Department Resources	13
Academic Advisors and Faculty Mentors	13
Graduate Studies Committee (GSC)	14
Bulletin Boards	14
Tech & Receiving	14
Computer Clusters	14
Printers	15
Keys	15
Graduate Student Lounges	15
Department Office/Building Security, Repairs and Services	15
ECE Graduate Student Organizations	16
Press & Media Relations	16
Electrical & Computer Engineering Brand & Logos	16
<b>PRE-MATRICULATION</b>	<b>16</b>
Admissions Policies	16
TOEFL Requirements and Language Proficiency	17
Deferral	17
Final Undergraduate Transcripts	17
Responsible Conduct of Research (RCR) Education	17
<b>ENROLLMENT AND REGISTRATION</b>	<b>18</b>
Overview	18
Degree Progress and Planning	18
Student Responsibility	18
Degree Requirements Timeframe	18
Summer Registration	19
Full and Part-time Requirements	19

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

M.S. in Electrical & Computer Engineering	33
A. ECE Core Graduate Coursework: 60 units	33
B. Electives: 36 units	33
M.S. Concentrations	33
M.S. in Software Engineering (SE)	34
A. SE Core Graduate Coursework: 60 units	34
B. Approved Electives: 36 units	35
M.S. in Software Engineering (SE) (F2014)	35
A. ECE Core Graduate Coursework: 60 units	35
B. Approved Electives: 36 units	36
Integrated Master's/Bachelor's Program	37
Course Restrictions	37
Internship Course Option	37
<b>POST-MATRICULATION GUIDELINES</b>	<b>37</b>
Return of University Property	37
Career Services Employment Outcomes	38
"Grandfather" Clause	38
<b>TUITION AND FEES</b>	<b>38</b>
Tuition Billing & Payments	38
Part-Time Students	38
University Financial Aid	38
Student Financial Obligation	39
<b>CAREER SERVICES</b>	<b>39</b>
Career Consultants	39
Job Search Guidelines	39
Job Classification and Salary Disclosure	40
<b>UNIVERSITY POLICIES</b>	<b>40</b>
Academic Integrity	40
Assistance for Individuals with Disabilities	40
Evaluation & Certification of English Fluency for Instructors	40
Leave of Absence & Withdrawal Policies	40
Tuition Refund Policy	41
Returning to Carnegie Mellon	41
Retention of Student Records	41
Safeguarding Educational Equity – Sexual Harassment and Sexual Assault Policy	41
Suspension/Required Withdrawal Policy	41
Withdrawal of a Degree	42
Withdrawal from Program	42
University Grievances	42
Student Maternity Accommodation Protocol	42
Verification of Employment	42
<b>APPENDIX A: ADDITIONAL UNIVERSITY RESOURCES</b>	<b>43</b>
Key Offices for Graduate Student Support	43
Office of the Assistant Vice Provost for Graduate Education	43
Office of the Dean of Student Affairs	43
Silicon Valley Student Services	44

Carnegie Mellon Ethics Hotline	44
Graduate Student Assembly	45
Intercultural Communication Center (ICC)	45
Office of International Education (OIE)	45
Key Offices for Academic & Research Support	46
Computing and Information Resources	46
Research at CMU	46
Office of Research Integrity & Compliance	46
Key Offices for Health, Wellness & Safety	47
Counseling & Psychological Services	47
Health Services	47
University Police	47
Shuttle and Escort Services	47
The WORD	48
<b>APPENDIX B: ADDITIONAL INFORMATION FOR CALIFORNIA PROGRAMS</b>	<b>51</b>

## WELCOME TO ELECTRICAL AND COMPUTER ENGINEERING

Welcome to the Department of Electrical and Computer Engineering at Carnegie Mellon University, a large and dynamic organization engaged in education, research, and entrepreneurship on a truly global scale, with locations and programs in Pittsburgh, Silicon Valley, Portugal, and Africa. The 2017 US News and World Report ranks our graduate research programs in electrical and computer engineering 9th and 2nd in the nation, respectively.

Since offering our first course in electrical engineering in 1908, the Department of Electrical and Computer Engineering has become one of the leading world programs preparing students for a number of diverse careers. Our distinguished faculty includes members of the National Academy of Engineering and works closely with students who come from throughout the United States and the world. Our research and teaching cover a broad spectrum of areas including device sciences and nanotechnology, computer systems, data science, energy, control, communications, and circuits, among others. Our electrical and computer engineers continue to push the boundaries of technology and shape the future of energy systems, hospitals, computers, and many others.

I hope you will browse through this catalog/handbook and our website and learn more about our department. Please contact us if you have any questions or comments.

Sincerely,

A handwritten signature in black ink, consisting of several overlapping loops and a long horizontal stroke extending to the right.

James C. Hoe  
Professor and Interim 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; 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, to apply all our skills and knowledge to execute our vision. We educate young people to become engineers sought after by industry and academia alike; we do so in an environment imbued by enthusiasm and love for what we do, with respect and willingness to listen to each other, with freedom to express our ideas and look at challenges from different 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

- Pittsburgh
- Silicon Valley
- Africa

Master of Science in Software Engineering

- Silicon Valley

Doctor of Philosophy in Electrical and Computer Engineering

- Pittsburgh
- Silicon Valley
- Portugal

### 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 masters' students in Pittsburgh, Silicon Valley, 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 catalog the following resources are available to assist you in understanding community expectations:

- [The Word/Student Catalog](#)
- [Academic Integrity Website](#)
- [University Policies Website](#)
- [Graduate Education Website](#)
- [College of Engineering Website](#)
- Please see [Appendix A](#) for additional information about The Word and 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 vice president for campus affairs, Carnegie Mellon University, 5000 Forbes Avenue, Pittsburgh, PA 15213, telephone 412-268-2056.

For general information about Carnegie Mellon University, call 412-268-2000.

The [Statement of Assurance](#) can also be found online.

## 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, 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 online.

## 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 Leonard Gelfand Center [Child Protection Operations](#).

If you have questions regarding Act 153 or encounter a situation when you would need to have the clearances, please contact Meighan at [meighan.harding@ece.cmu.edu](mailto:meighan.harding@ece.cmu.edu).

## DEPARTMENTAL INFORMATION

### University Personnel

Throughout your time in the M.S. 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 M.S. program.

- Dean of the College of Engineering: [Professor James H. Garrett](#)
- Associate Dean of Graduate and Faculty Affairs: [Professor Jonathan Cagan](#)
- Assistant Vice Provost for Graduate Education and University Graduate Student Ombudsman: [Dr. Suzie Laurich-McIntyre](#)
- Interim Department Head: [Professor James C. Hoe](#)
- Executive Assistant to the Department Head and Director of Administrative Services: [Christina Cowan](#)
- Director, CMU Africa: [Professor Vijayakumar Bhagavatula](#)
- Associate Department Head for Research and Strategic Initiatives: [Professor José M.F. Moura](#)
- Associate Department Head for Academic Affairs: [Professor James A. Bain](#)
- Senior Director of Operations: [Meighan Harding](#)
- Director of Finance and Sponsored Research: [Charlotte Ambrass](#)
- Director of Student and Academic Affairs: [Leona Kass](#)
- Director of Graduate Affairs: [Tara Moe](#)
- Advisor, Student Organizations & Activities: [Bari Morchower](#)
- Advisor, Student Organizations & Activities in Silicon Valley: [Brittany Reyes](#)
- Ph.D. Academic Program Advisor: [Nathan Snizaski](#)
- Ph.D./M.S. Academic Program Advisor in Silicon Valley: [Stephanie Caruso](#), [Brittany Reyes](#)
- M.S. Academic Program Advisor: [Nesli Ozdoganlar](#)
- M.S. Academic program Advisor: [Jillian McCarthy](#)
- Student Services Officer, CMU Rwanda: [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 Stellic Degree Audit Application which includes degree planning tools can show how courses taken or registered for meet the degree requirements. 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. The complete university policies are available online at the following link: <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 website.

- The Office of the Assistant Vice Provost for Graduate Education. Website: [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. Website: [www.cmu.edu/student-affairs/index.html](http://www.cmu.edu/student-affairs/index.html)
- Student Services in Silicon Valley. Website: <http://www.cmu.edu/silicon-valley/campus-life/index.html>
- Assistance for Individuals with Disabilities. Contact Larry Powell, Equal Opportunity Services, 412-268-2013, [lpowell@andrew.cmu.edu](mailto:lpowell@andrew.cmu.edu)
- Eberly Center for Teaching Excellence. Website: [www.cmu.edu/teaching](http://www.cmu.edu/teaching)
- Graduate Student Assembly. Website: <http://www.cmu.edu/stugov/gsa/index.html>
- Intercultural Communication Center. Website: [www.cmu.edu/icc](http://www.cmu.edu/icc)
- Office of International Education. Website: <http://www.studentaffairs.cmu.edu/oie/>
- Counseling & Psychological Service. Website: <https://www.cmu.edu/counseling/>
- Health Services. Website: [www.cmu.edu/HealthServices](http://www.cmu.edu/HealthServices)
- University Police. Website: [www.cmu.edu/police](http://www.cmu.edu/police)
- The Word (student online handbook). Website: <http://www.cmu.edu/student-affairs/theword>
- Academic Integrity Website: [www.cmu.edu/academic-integrity](http://www.cmu.edu/academic-integrity)
- University Policies Website: [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>

The Silicon Valley campus does not have a physical library on campus, but students, staff, and faculty are able to use CMU library online resources by visiting the [CMU Library website](#), as well as local library resources. More information about local library resources can be found at this website: <http://sv.cmu.edu/student-services/library-resources.html>

## Department Resources

### Academic Advisors and Faculty Mentors

Your academic advisor is a resource for having any university paperwork signed, asking questions regarding registration or the curriculum, and guiding you to other important resources. Nesli Ozdoganlar, Jillian McCarthy, Brittany Reyes, and Stephanie Caruso are your academic advisors.

Academic advising is done through the Graduate Affairs Office. In Pittsburgh, this is in Hamerschlag Hall 1113; in Silicon Valley this is in B19 Room 1060. The M.S. Academic Program Advisor administratively advises all ECE M.S. students throughout the entire duration of the M.S. program. While this advisor does not provide content-specific expertise in ECE, he/she helps students navigate through the program by tracking milestones, meeting one on one and in groups with students for questions related to registration or the curriculum, guiding students to other important resources, completing enrollment and university-related paperwork, and answering questions for students who may not know where else to turn.

Nesli can be reached by email: [neslio@andrew.cmu.edu](mailto:neslio@andrew.cmu.edu), by phone: (412) 268-6581, or in person in 1113 Hamerschlag Hall. To guarantee availability, you are encouraged to schedule an appointment with her by accessing her [calendar](#) in the signature block of her e-mail. Nesli advises Pittsburgh based M.S. students A-L, and Porto M.S./MBA students.

Jillian can be reached by email: [jrmccart@andrew.cmu.edu](mailto:jrmccart@andrew.cmu.edu), by phone: (412) 268-3077, or in person in 1113 Hamerschlag Hall. To guarantee availability, you are encouraged to schedule an appointment with her by accessing her [calendar](#) in the signature block of her e-mail. Jillian advises Pittsburgh based M.S. students M-Z, all IMB students and M.S. ECE students in CMU-Africa.

Stephanie can be reached by email: [stephaniec@cmu.edu](mailto:stephaniec@cmu.edu), or by phone: (650) 335-2853. To guarantee availability, you are encouraged to schedule an appointment with her by accessing her [calendar](#) in the signature block of her e-mail. Stephanie advises all Silicon Valley based M.S. ECE and M.S. Software Engineering students.

Brittany can be reached by email: [bjreyes@andrew.cmu.edu](mailto:bjreyes@andrew.cmu.edu), or by phone: (650) 335-2854. To guarantee availability, you are encouraged to schedule an appointment with her by accessing her [calendar](#) in the signature block of her e-mail. Brittany advises all Silicon Valley based M.S. ECE and M.S. Software Engineering students.

Olga can be reached by email: [gbuki@andrew.cmu.edu](mailto:gbuki@andrew.cmu.edu), by phone 250-784644833 or in person on the CMU Africa [campus](#) 4<sup>th</sup> floor Telecom House. Olga advises CMU-Africa based M.S. students.

Students will also be assigned a faculty mentor during the first two weeks of classes. A faculty mentor is a resource for questions related to specific content knowledge about ECE. They can also offer advice regarding future career and courses students may want to take to prepare. Whenever possible, faculty are matched to students based the area of interest indicated on the ECE application. Students are encouraged to connect with their faculty mentor once assigned.

## Graduate Studies Committee (GSC)

The Graduate Studies Committee is a committee consisting of ECE faculty and ex-officio administrators from the Graduate 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 2018-2019 academic year is Professor L.R. Carley. The dates for the GSC meetings will be posted on the [ECE's Graduate Portal](#) (requires Andrew ID log in) under GSC procedures section before the start of each semester.

## Bulletin Boards

### Pittsburgh campus

- 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.

### Silicon Valley campus

- Students in Silicon Valley can find bulletin boards located in Buildings 23 and 19. Bulletin boards will be cleared on a regular basis.

## Tech & Receiving

### Pittsburgh campus

- 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

### Silicon Valley campus

- Students on the Silicon Valley campus should work with their instructor if supplies are needed.

## Computer Clusters

In Pittsburgh, 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 compute clusters. Access to those clusters is only available with the consent of the party who owns the cluster. There are not computer clusters available in Silicon Valley.

## Printers

**Printers** are provided for student academic use.

Pittsburgh campus

- Andrew Public Printing stations are available in HH A101, A104, 1303, and 1310.

Silicon Valley campus

- Printers are for use in Building 23 (B23) Room 123, the hallway in B23 outside of 109/110, the Building 19 (B19) kitchen/lounge, and at the end of the 1030 wing in B19. Instructions for adding printers and policies are posted next to each printer. Silicon Valley printers do not use Plaid Cash.

## Keys

Silicon Valley campus

- The Silicon Valley Facilities will provide you with a key to the Master's study suites in Building 19 at orientation. To avoid any financial implications to you, your key must be returned prior to your final departure from CMU. To report a lost key or to request a replacement, please email [facilities@sv.cmu.edu](mailto:facilities@sv.cmu.edu).

## Graduate Student Lounges

Pittsburgh campus

- The **graduate student lounge** in Pittsburgh is located in the top floor of Hamerschlag Hall. The Masters' student lounge is located Porter Hall B48/B54. Access to both spaces is given manually, but if you do not have access by the 3rd week of classes, please see **Jessica Tomko** in the Graduate Affairs Office (1113 HH).

Silicon Valley campus

- There are several spaces for students in Silicon Valley to use. The main student lounges can be found in B23, downstairs Room 129 and upstairs Room 227. In B19, students can utilize the Bay Room (B19 Room 1040).

## Department Office/Building Security, Repairs and Services

Pittsburgh campus

- Any damages, repairs, or security concerns should be reported to Alan Grupe, Facilities Manager, by emailing [help@ece.cmu.edu](mailto:help@ece.cmu.edu). In an emergency, please contact University Police at 412-268-2323.

Silicon Valley campus

- Any damages, repairs, or security concerns should be reported to Stacy Marshall, Facilities and Events Manager, by emailing [facilities@sv.cmu.edu](mailto:facilities@sv.cmu.edu). In an emergency, please contact NASA Police at 650-604-5555.

## ECE Graduate Student Organizations

- **EGO (ECE Graduate Student Organization)** organizes academic and social events throughout the academic year.
- **WinECE (Women in Electrical and Computer Engineering)** provides academic and social events to women in ECE throughout the year.
- **HKN (Eta Kappa Nu)** is the honor society for Electrical and Computer Engineering students. HKN members engage in community service, professional engagement, and social activities. Ph.D. students are invited by the board of HKN to join based on academic performance.
- **ECE Outreach** is a student organization that aims to provide middle school 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.

For more information on graduate student organizations and opportunities for future involvement in the ECE department, please contact **Bari Morchower**, Student Organizations and Activities Advisor in Pittsburgh, or **Brittany Reyes**, Academic Services Coordinator and Student Organizations Advisor in Silicon Valley.

## Press & Media Relations

ECE's Assistant Director of Communications is the point-of-contact between news media and the ECE, including faculty, students, and staff.

If any student, staff or faculty member of ECE is contacted by a media representative, they are required to immediately inform either the Communication Manager and/or the Director of Operations. Members of the ECE community are not required to answer any questions from the media without first seeking information from ECE's Communication Manager and/or the Director of Operations.

Persons interested in publicizing a program, project, event, or other activity affiliated within ECE should contact the Communications Manager **Krista Burns** who can provide guidance on internal and external communications.

## Electrical & Computer Engineering Brand & Logos

The **Information Technology Services (ITS) website** contains information regarding the department's branding and identity standards.

## 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 alum.

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.

Nonnative English speakers may utilize the Intercultural Communication Center (ICC) for language support: <https://www.cmu.edu/icc/>. The Silicon Valley campus also has a Communications and Language Services Office for additional language support for nonnative English speakers: <http://sv.cmu.edu/student-services/communication-language-services.html>

## 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.

## Final Undergraduate Transcripts

Applicants admitted to any ECE program 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 M.S. degree from being certified.

## Responsible Conduct of Research (RCR) Education

The [Office of Research Integrity and Compliance website](#) 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.

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 their process by reviewing degree requirements on the website, connecting with their academic advisor, and conferring with a faculty mentor. 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 with their Andrew ID at [The Hub](#).

Within SIO, there is a Course Planning module that allows students 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 within [The HUB's Academic Calendar](#).

If a student is not progressing as expected, they are expected to seek advice and counsel from their academic advisor. If the student is concerned that they may be unable to complete degree requirements, they should contact their academic advisor for assistance.

#### Degree Requirements Timeframe

The duration of the ECE program is three full-time semesters (fall-spring-fall, or spring-fall-spring). 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 he or she is not here by the tenth day of class as defined by the [academic calendar](#).

International students will be given a 16 month I-20 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 less than three semesters. Please see details and relevant forms on OIE's website under [Maintaining Legal Status](#).

## 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 M.S. degree, if appropriate.

Eligible international students who are completing an internship in the United States must complete the paperwork for Curricular Practical Training (CPT). 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. Academic and OIE advisors will provide students with information about CPT during the spring semester.

## Full and Part-time Requirements

The M.S. degree program is a full-time program in which students complete three full-time (36 units) semesters (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 two semesters and should consult with their 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.

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

## Statute of Limitations

ECE adheres to [CIT's policy on M.S. completion timelines](#). The CIT policy is as follows: "All units required for a master's degree in the College of Engineering, whether earned in residence or transferred from another institution, must be recorded on the transcript within six years of the date on which the student enrolled in the program." Former ECE students who did not fulfill

graduation requirements and would like to return to complete a degree should refer to the [statute of limitations](#) in CIT's graduate student policies for more information.

## 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 to change 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. Locations 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.

## Change of Degree Program

Sometimes students begin their M.S. program and realize that would like to transfer to a different degree program than the one they were admitted to. When this occurs, students may have the option of applying to transfer to another M.S. degree program in the ECE Department (M.S. ECE or M.S. 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. The students are responsible for all academic and financial impacts related to the change. Prior to changing to a new M.S. degree program, international students should consult with OIE.

## Courses Outside of Degree Requirements

Courses that do not satisfy degree requirements include StuCo courses (98), Physical Education course (69), audited courses, and pass/fail courses. Similar to courses taken for degree requirements, students must register for these other 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.

The same course taken two separate times will not count towards the ECE M.S. If a student takes the same course twice, the course with the higher grade will be counted towards the ECE M.S. course requirements.

## Maximum Units Allowed

No more than 120 units maximum should be taken while pursuing your degree. These units include courses taken for audit, pass/no pass, and withdrawal. Please refer to CIT policy on [M.S. degree units](#) for additional information.

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 M.S. ECE or SE program.

## Maximum Units Allowed Outside CIT

Effective fall 2018, M.S. ECE and M.S. SE students at all campuses may take no more than 48 units outside the College of Engineering, even if a student has already completed all M.S. ECE/M.S. SE requirements. Please see the [M.S. ECE Requirements](#) and [M.S. SE Requirements](#) pages on our website for details on which students this rule affects.

## M.S. Concentrations

Four concentrations are available for M.S. students to choose from, allowing for focused study in a specific area of electrical and computer engineering. 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. M.S. 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)

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

## Retaking Courses

If students do not pass a course, they should take a different course that will fulfill the requirement. Retaking a course is not recommended. 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](#).
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 will not be 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. 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](#) to their academic advisor for approval. If approved, the academic advisor will send the form to the HUB for processing.

Once a Pass/Fail 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. 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; work with a grade at or lower than 'D+' 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 will not be able to request the option to pass/fail a course.

Any student may take a course pass/fail. For billing, the pass/fail course is considered the same as the traditional courses under the tuition charges. If a part-time student takes a course pass/fail, he/she will be charged part-time tuition based on the per-unit tuition rate for the course.

## Petition Process

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

The petitions process is as follows:

1. Student completes the appropriate petition form ([M.S. ECE GSC Petition form](#), or [M.S. SE GSC Petition form](#)) and submits it to their academic advisor in the Graduate Affairs Office no later than 5pm ET on the Friday before the GSC meeting.
2. The academic advisor presents the petition to the GSC.
3. Students are notified of the outcome of their petition via an email from the M.S. 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. When this occurs, students will be notified via email.
5. The 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 M.S. degree. As a guideline, three-credit courses from other universities equate to 9-unit CMU courses; a four-credit course equates to a 12-unit CMU course.

The course being transferred in must:

- Fulfill an ECE degree course requirement and is 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](#) (under 'Transfer Credit and 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. Appropriate petition form ([M.S. ECE GSC Petition form](#), or [M.S. SE GSC Petition form](#))
  - 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](#)
3. Submit the completed packet to the academic advisor
4. The 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, the Graduate Affairs Office will work 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 website](#) for additional details.

## Research for Credit

Students can apply up to 15 units of research credit towards their M.S. degree requirements by registering for the 18-980, M.S. Research Project course. 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. Students are encouraged to wait until their second semester to pursue research or teaching opportunities.

MS 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 will have access to the system on the first day of classes.
- You can view the details of the research projects listed and click the apply button to submit an application.
- 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 in the project.

## Registering for Courses

### Academic Calendar

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 these programs, students are advised to take 37 units of courses in their first semester 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 may should schedule an appointment with their academic advisor to discuss their reason for overloading and prepare a plan for how to handle the additional load.

## 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](#) 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.

Courses in the Tepper School of Business may be taken and can be registered for through a site outside the SIO. Tepper will publish a list of available MBA courses, and in order to register for Tepper courses, students should visit the [Tepper registration site](#).

## Course Locations

Courses will take place at various buildings and room locations across CMU campuses 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 available on your campus.

## 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 the disruption 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, the student must officially withdraw from the course and should consult with their advisor to discuss the withdrawal. Withdrawals take place after the drop deadline but before the last day of the semester. Students must complete and submit the [Course Withdrawal Request form](#) 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](#). Withdrawals receive a "W" grade for the course on a transcript; this "W" grade is not factored into the QPA but the course does count towards the maximum units.

## 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 within the department have the opportunity to take the courses they need in order to graduate. To determine the likelihood that you will be registered from a waitlist for an ECE course, students in Pittsburgh should send an e-mail to [coursehub@ece.cmu.edu](mailto:coursehub@ece.cmu.edu); students in Silicon Valley should email Brittany Reyes at [bjreyes@andrew.cmu.edu](mailto:bjreyes@andrew.cmu.edu). 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.

## Technology Enhanced Courses

The ECE department 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 (Pittsburgh, Silicon Valley) 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 two courses that conflict in time. Registration may be possible with consent from an instructor, 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

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/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 18-600/15-213/15-513/18-213 as a prerequisite, students will not be permitted to enroll in the subsequent course without credit for 18-600/15-513. 18-600 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 18-600/15-213/15-513/18-213 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

## 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, he or she 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.

## Research Assistant & Teaching Assistant Positions

Students are encouraged to wait until their second semester to pursue research or teaching opportunities.

### Research for Assistant for Credit

See the section titled "[Research for Credit](#)" for more information about receiving academic credit for research.

### Research for 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](#).

## *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.

## 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.

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. 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 note that the ECE department is only able to verify information on ECE and Computer Science courses. Information on courses offered in other departments can only be verified by the other department. 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 his or her academic advisor prior to taking a leave of absence in order to ensure his or her understanding of the leave of absence policy and its ramifications.

Leaves of absences are capped at two calendar years' total throughout the M.S. 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 two-year leave (including CMU graduates with ECE BS degrees who have not declared their IMB prior to graduation) must re-apply to the graduate program. Questions can be addressed to the M.S. Academic Program Advisor.

Once a student decides to take a leave of absence, he or she should complete the [Leave of Absence form](#) and bring it to their academic advisor for additional processing. Please note that the student's advisor must sign the leave of absence form.

## Returning from a Leave of Absence

A student intending to return from leave must submit the [Petition to Return from Leave of Absence form](#) to their academic advisor at least 30 days prior to the start of the semester in which he/she plans 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 [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."

More information about the University's [Leave of Absence and Withdrawal](#) policies can be found in the University Policies section of this handbook.

## Degree Certification Process & Commencement

A student must satisfy all degree requirements and achieve a minimum of 3.0 QPA in the courses being applied towards the required 97 units 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.

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 will be invited to attend the next commencement ceremony. Spring graduates will be 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 or Master of Science in Software Engineering.

## ACADEMIC STANDARDS

### Grades

Below are the policies surrounding grades for students in the Department of Electrical and Computer Engineering.

### 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, drop/withdrawals and course repeats. It also defines the undergraduate and graduate grading standards.

## 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.

## Incomplete Grade

Incomplete grades will be assigned at the discretion of the course instructor, per the [university grading policy](#).

## Withdrawal Grade/Withdrawing from Courses

Students can withdraw from a course after the add/drop deadline until the last day of classes. This will result in a 'W' on the transcript, which is not factored into the QPA. To withdraw, the [course withdrawal request form](#) 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.

## 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 units. 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.

### 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

Students at Carnegie Mellon are engaged in preparation for professional activity of the highest standards. Each profession constrains its members with both ethical responsibilities and disciplinary limits. To assure the validity of the learning experience a university establishes clear standards for student work.

In any presentation, creative, artistic, or research, it is the ethical responsibility of each student to identify the conceptual sources of the work submitted. Failure to do so is dishonest and is the basis for a charge of cheating or plagiarism, which is subject to disciplinary action.

ECE adheres to Carnegie Mellon's [policy on academic integrity](#) and all students are expected to review the policies prior to their arrival at CMU. ECE also adheres to [CIT's policy](#) on graduate student academic integrity violations.

## Penalties for Violating Academic Integrity

Instructors are responsible for defining academic integrity for students in their courses, including student performance expectations and attendance requirements. Students are responsible for understanding and abiding by the instructor's academic integrity policies. Policies may vary from instructor to instructor and students should seek further guidance from a faculty member if they have specific questions about a course's academic integrity policy.

Should an instructor believe that an academic integrity violation has occurred, he or she may consult with the Office of the Dean of Student Affairs, 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, he/she will be reenrolled.

If a student is found to have violated the academic integrity policy for a second time, the student will be dropped from the Department of Electrical and Computer Engineering effective at the end of the semester in which the infraction has occurred. Students have the right to **appeal an academic integrity decision**.

## M.S. DEGREE REQUIREMENTS

This section outlines the degree requirements for the **Master's of Science in Electrical & Computer Engineering** in Pittsburgh, Silicon Valley, CMU-Africa, and Technology Enhanced programs, and the **Master's of Science in Software Engineering in Silicon Valley**. ECE course list and course descriptions are available on the ECE course website: <https://courses.ece.cmu.edu>.

## M.S. in Electrical & Computer Engineering

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

Each M.S. ECE candidate must complete 97 units (1 unit = 1 hour of work) of coursework. All incoming M.S. ECE students must take the one-unit Introduction to Graduate Studies course (18-989) in their first semester. Please see the [M.S. 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 (A and B) 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.

#### **A. 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 at the 700 level or above can be counted. For exceptions to the rule and pre-approved courses from other departments, please visit the M.S. ECE Course Requirements webpage: <http://www.ece.cmu.edu/programs-admissions/masters/ms-requirements.html>

#### **B. 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 listed in sections A, B1, and B2.

##### ***B1. 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 M.S. ECE Course Requirements webpage: <http://www.ece.cmu.edu/programs-admissions/masters/ms-requirements.html>

##### ***B2. Less-Restricted Elective: 12 units***

Less-restricted elective courses are courses that may include courses from the same colleges, departments and programs listed in sections A and B1 above, but may be at the undergraduate level (xx-300 or greater). 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 M.S. 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.

## **M.S. 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 [M.S. Concentrations](#).

## M.S. in Software Engineering (SE)

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

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

## A. SE Core Graduate Coursework: 60 units

The SE program requires 60 units of core coursework that may not be waived or substituted. Students are required to take 18-652, Foundations of Software Engineering, in their first semester. In addition to 18-652, it is also strongly recommended that students take at least three additional core Software Engineering courses (in the range 18653-18659).

To complete the 60 units of core coursework, students should choose at least one course in each of the following three areas:

### *Software Engineering and Design*

- 18-652 Foundations of Software Engineering (required)
- 18-653 Software Architecture
- 18-658 Software Requirements and Interaction Design

### *Analysis*

- 18-654 Software Verification, Validation and Testing
- 18-656 Data Intensive Workflow Development for Software Engineers
- 18-657 Decision Analysis and Engineering Economics for Software Engineers
- 18-697 Statistical Discovery and Learning

### *Systems*

- 18-600 Foundations of Computer Systems
- 18-638 Mobile Security
- 18-644 Mobile Hardware for Software Engineers
- 18-645 How to Write Fast Code
- 18-655 Service Oriented Computing
- 18-659 Software Engineering Methods
- 18-747 Wireless Device Architecture
- 18-842 Distributed Systems
- 18-843 Mobile and Pervasive Computing

The remaining 24 units can be additional coursework in the above areas or 12 units of a **graduate research project** (18-980).

## B. Approved 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 listed in sections A, B1, and B2.

### *B1. 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 M.S. SE Course Requirements webpage: <https://www.ece.cmu.edu/academics/ms-se/requirements.html>

### *B2. Less-Restricted Elective: 12 units*

Less-restricted elective courses are courses that may include courses from the same colleges, departments and programs listed in sections A and B1 above, but may be at the undergraduate level (xx-300 or greater). 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 M.S. 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.

## M.S. in Software Engineering (SE) (F2014)

### ***For students entering the program Spring 2017 or earlier:***

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

## A. ECE Core Graduate Coursework: 60 units

The SE program requires 60 units of core coursework that may not be waived or substituted. Students are strongly advised to take 18-652, Foundations of Software Engineering, in their first semester. In addition to 18-652, it is also recommended that students take at least three additional core Software Engineering courses (courses in the range 18653-18659).

To complete the 60 units of core coursework, students should choose at least one course in each of the following three areas:

### ***Software Engineering and Design:***

- 18-652 Foundations of Software Engineering
- 18-653 Software Architecture
- 18-655 Service Oriented Computing
- 18-658 Software Requirements and Interaction Design

### *Analysis*

- 18-654 Software Verification, Validation and Testing
- 18-657 Decision Analysis and Engineering Economics for Software Engineers
- 18-660 Numerical Methods for Engineering Design and Optimization
- 18-687 Analytical Performance Modeling
- 18-697 Statistical Discovery and Learning

### *Systems*

- 18-638 Mobile Security
- 18-640 Foundations of Computer Architecture
- 18-644 Mobile Hardware for Software Engineers
- 18-645 How to Write Fast Code
- 18-646 Low-Power System-on-Chip Architecture
- 18-647 Connected Embedded Systems Architecture
- 18-656 Data-Intensive Workflow Development for Software Engineers
- 18-659 Software Engineering Methods
- 18-842 Distributed Systems
- 18-843 Mobile and Pervasive Computing

The remaining 24 units can be additional coursework in the above areas or 12 units of a **graduate research project** (18-980).

## **B. Approved 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 listed in sections A, B1, and B2.

### ***B1. 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 M.S. SE Course Requirements webpage: <https://www.ece.cmu.edu/academics/ms-se/requirements.html>

### ***B2. Less-Restricted Elective: 12 units***

Less-restricted elective courses are courses that may include courses from the same colleges, departments and programs listed in sections A and B1 above, but may be at the undergraduate level (xx-300 or greater). 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 M.S. 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.

## 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 M.S. students. This includes M.S. 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 97 units for any M.S. program in the department of Electrical and Computer Engineering. Mini courses worth 12 units cannot be used towards the required 97 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 the program websites:

M.S. ECE <http://www.ece.cmu.edu/programs-admissions/masters/ms-requirements.html>

M.S. SE <https://www.ece.cmu.edu/academics/ms-se/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 may wish to participate in paid internships at off-campus organizations during the summer months.

ECE will enroll all students who are pursuing an 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 ECE M.S. 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.

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 **ECE 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](#). Students will find the Graduate Financial Aid Guide, information about funding options, how to apply for financial aid and other helpful links.

Graduate students who find themselves in need of immediate funds for emergency situation should contact the Office of the Dean of Student Affairs to inquire about an Emergency Situation 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 assigned career consultants who provide guidance through one-on-one appointments. Students in Pittsburgh can meet with career consultants [Marcie Foy](#) and [Shaina Tsupros](#), while students in Silicon Valley can meet with Director of Career Services [Lauren Schachar](#) or Career Consultant [Leigh Mason](#). Appointments with Marcie, Shaina, Lauren, or Leigh can be made through Handshake. They will each 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 searched in a manner that does not impede the academic progress through their graduate program.

It is also important for students to have an understanding of 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.

## Job Classification and Salary Disclosure

The job classification(s) the M.S. ECE and SE programs prepares its graduates for can be found at the following link:

<https://cmu.box.com/s/6a6a0g83ftgfgs9fce0b1vx47cqm4gu1>

## 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

Students with disabilities are encouraged to self-identify with [Office of Disability Resources](#) by contacting [Catherine Getchell](#), 412-268-6121, to access the services available at the University. For more information, please visit the link below: <http://www.cmu.edu/education-office/disability-resources/>

### 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 Intercultural Communication Center. For details please visit the links below:

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

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

### 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

Sexual harassment and sexual assault are specifically prohibited by Carnegie Mellon University, as is retaliation for having brought forward a concern or allegation. This policy is intended to clearly identify violations of this standard, provide resources to deal with their effects, and describe detailed procedures to address complaints of sexual harassment, including sexual assault. The complete policy can be found at the following link:  
<http://www.cmu.edu/policies/administrative-and-governance/sexual-harassment-and-sexual-assault.html>

## 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 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, he or she 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). The complete reference to this policy is available at: <http://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: ADDITIONAL UNIVERSITY RESOURCES

Highlighted University Resources for Graduate Students and The WORD Student Catalog

### Key Offices for Graduate Student Support

#### Office of the Assistant Vice Provost for Graduate Education

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

The Office of the Assistant Vice Provost for Graduate Education, AVPGE, directed by Suzie Laurich-McIntyre, Ph.D., Assistant Vice Provost for Graduate Education, provides central support for graduate students in a number of roles. These include: being an ombudsperson and resource person for graduate students as an informal advisor; resolving formal and informal graduate student appeals; informing and assisting in forming policy and procedures relevant to graduate students; and working with departments on issues related to graduate students and implementation of programs in support of graduate student development.

The Office of the AVPGE often partners with the division of Student Affairs to assist graduate students with their Carnegie Mellon experience. Senior members of the student affairs staff are assigned to each college (college liaisons) and are often consulted by the Assistant Vice Provost for Graduate Education and departments on an individual basis to respond to graduate student needs.

The Office of the Assistant Vice Provost for Graduate Education (AVPGE) offers a robust schedule of professional development opportunities. Some are geared towards a specific population (master's students, PhD students at the beginning of their program, graduate students seeking tenure track positions, etc.) and others are open to all graduate students (time management, balancing, staying healthy). A full schedule of programs can be found at: <http://www.cmu.edu/graduate>.

The Office of the AVPGE also coordinates several funding programs, and academically focused seminars and workshops that advise, empower and help retain all graduate students, particularly graduate students of color and women in the science and technical fields. The fundamental goals of our programs have been constant: first, to support, advise and guide individual graduate students as they work to complete their degrees; second, to contribute to the greatest degree possible to the diversification of the academy. Visit the Graduate Education website for information about:

- Conference Funding Grants
- Graduate Small Project Help (GuSH) Research Funding
- Graduate Student Professional Development: seminars, workshops and resources
- Graduate Women Gatherings (GWG)
- Inter-university Graduate Students of Color Series (SOC)

#### Office of the Dean of Student Affairs

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

The Office of the Dean provides central leadership of the metacurricular experience at Carnegie Mellon. Please visit the link below for detailed information on Division of Student Affairs departments: <https://www.cmu.edu/student-affairs/index.html>.

Graduate students will find the enrollment information for Domestic Partner Registration and Maternity Accommodations in the Office of the Dean of Student Affairs and on the website. The Office of the Dean of Student Affairs also manages the Emergency Student Loan (ESLs) process. The Emergency Student Loan service is made available through the generous gifts of alumni and friends of the university. The Emergency Student Loan is an interest-free, emergency-based loan repayable 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. The Office of the Dean of Student Affairs also provides consultation, support, resources and follow-up on questions and issues of Academic Integrity: [www.cmu.edu/academic-integrity](http://www.cmu.edu/academic-integrity).

### Silicon Valley Student Services

Students on the Silicon Valley campus can meet with the Director of Student Affairs, Sari Smith, for on-site connection to various student services resources. These resources include questions regarding housing, transportation, health, personal concerns, student organizations, activities and general campus information. Sari Smith's office is located in B19 Room 1041, and can be reached by phone at 650-335-2846 or email at [sari.smith@sv.cmu.edu](mailto:sari.smith@sv.cmu.edu). The CMU-SV Student Services Webpage has more information about student services in Silicon Valley: <http://www.cmu.edu/silicon-valley/campus-life/index.html>

### Silicon Valley Student Housing

The CMU campus in Silicon Valley does not offer any on campus housing or off campus housing. However, more information about housing options for students at the Silicon Valley campus can be found at:

<http://sv.cmu.edu/student-services/index.html>

### Eberly Center for Teaching Excellence & Educational Innovation

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

Support for graduate students who are or will be teaching is provided in many departments and centrally by the Eberly Center for Teaching Excellence & Educational Innovation. The Eberly Center offers activities for current and prospective teaching assistants as well as any graduate students who wish to prepare for the teaching component of an academic career. The Center also assists departments in creating and conducting programs to meet the specific needs of students in their programs. Specific information about Eberly Center support for graduate students can be found at:

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

### Carnegie Mellon Ethics Hotline

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 financial matters, academic and student life, human relations, health and campus safety or research.

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 will be reported to appropriate university personnel.

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

## Graduate Student Assembly

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

The Carnegie Mellon Student Government consists of an Executive Branch and a Legislative Branch. This is the core of traditional student government, as governed by the Student Body Constitution. The Executive Branch serves the entire student body, graduate and undergraduate, and consists of one president and four vice-presidents. The Legislative Branch for graduate students, The Graduate Student Assembly (GSA) passes legislation, allocates student activities funding, advocates for legislative action in locally and in Washington D.C. on behalf of graduate student issues and needs, and otherwise acts on behalf of all graduate student interests. GSA also contributes a significant amount of funding for conferences and research, available to graduate students through application processes. GSA also plans various social opportunities for graduate students and maintains a website of graduate student resources on and off-campus, [www.cmu.edu/stugov/gsa/resources/index.html](http://www.cmu.edu/stugov/gsa/resources/index.html). Each department has representation on GSA and receives funding directly from GSA's use of the student activities fee for departmental activities for graduate students. The department rep(s) is the main avenue of graduate student representation of and information back to the graduate students in the department.

## Intercultural Communication Center (ICC)

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

The Intercultural Communication Center (ICC) is a support service offering both credit and non-credit classes, workshops, and individual appointments designed to equip nonnative English speakers (international students as well as international students who attended high school in the U.S.) with the skills needed to succeed in academic programs at Carnegie Mellon. In addition to developing academic literacy skills such as speaking, reading and writing, students can learn more about the culture and customs of the U.S. classroom. The ICC also helps international teaching assistants (ITAs) who are non-native English speakers develop fluency and cultural understanding to teach successfully at Carnegie Mellon and provides ITA testing, required testing indicating a nonnative speaking student has a language proficiency required before being allowed to work with undergraduates in classes, labs or individual meetings.

## Office of International Education (OIE)

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

Carnegie Mellon hosts international graduate and undergraduate students who come from more than 90 countries. Office of International Education (OIE) is the liaison to the University for all

non-immigrant students and scholars. OIE provides many services including: advising on personal, immigration, academic, social and acculturation issues; presenting programs of interest such as international career workshops, tax workshops, and cross-cultural and immigration workshops; supporting international and cultural student groups such as the International Student Union and the International Spouses and Partners Organization; maintaining a resource library that includes information on cultural adjustment, 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 programs.

## Key Offices for Academic & Research Support

### Computing and Information Resources

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

Computing Services provides a comprehensive computing environment at Carnegie Mellon. Graduate students should seek Computing Services for information and assistance with your Andrew account, network access, computing off-campus, campus licensed software, email, calendar, mobile devices, computer security, cluster services and printing. Computing Services can be reached at [it-help@cmu.edu](mailto:it-help@cmu.edu).

The Carnegie Mellon Computing Policy establishes guidelines and expectations for the use of computing, telephone and information resources on campus. The policy is supported by a number of guidelines graduate students should know. The policy and guidelines are available at: [www.cmu.edu/computing/guideline/index.html](http://www.cmu.edu/computing/guideline/index.html).

### Research at CMU

<http://www.ece.cmu.edu/research/index.html>

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

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

The Office of Research Integrity & Compliance (ORIC) is designed to support research at Carnegie Mellon University. The staff work with researchers to ensure research is conducted with integrity and in accordance with federal and Pennsylvania regulation. ORIC assists researchers with human subject research, conflicts of interest, responsible conduct of research, export controls, **intellectual property** rights and regulations, and institutional animal care & use. ORIC also consults on, advises about and handles allegations of research misconduct.

## Key Offices for Health, Wellness & Safety

### Counseling & Psychological Services

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

Counseling & Psychological Services (CAPS) affords the opportunity for students to talk privately about issues that are significant for them in a safe, confidential setting. Students sometimes feel confused about why they are feeling upset and perhaps confused about how to deal with it. An initial consultation with a CAPS therapist will clarify options and provide a recommendation to the appropriate mental health resource at Carnegie Mellon or the larger Pittsburgh community. CAPS services are provided at no cost. Appointments can be made in person or by telephone, 412-268-2922.

### Health Services

<https://www.cmu.edu/health-services/>

University Health Services (UHS) is staffed by physicians, advanced practice clinicians and registered nurses who provide general medical care, allergy injections, first aid, gynecological care and contraception as well as on-site pharmaceuticals. The CMU student insurance plan covers most visit fees to see the physicians and advanced practice clinicians & nurse visits. Fees for prescription medications, laboratory tests, diagnostic procedures and referral to the emergency room or specialists are the student's responsibility and students should review the UHS website and their insurance plan for detailed information about 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. Graduate students should contact UHS to discuss options for health insurance for spouses, domestic partners and dependents. Appointments can be made by visiting UHS's website or by telephone, 412-268-2157.

### University Police

<https://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, Room 199 (entrance is on Filmore Street). The department's services include police patrols and call response, criminal investigations, shuttle and escort services, fixed officer and foot officer patrols, event security, and crime prevention and education programming. Visit the department's website for additional information about the staff, escort and shuttle, emergency phone locations, crime prevention, lost and found, finger print services, and annual statistic reports.

### Shuttle and Escort Services

University Police coordinates the Shuttle Service and Escort Service provided for CMU students, faculty, and community. Full information about these services, stops, routes, tracking and

schedules can be found online at:  
<https://www.cmu.edu/police/Shuttle%20and%20Escort/shuttle-service.html>.

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 [www.cmu.edu/police/annualreports](http://www.cmu.edu/police/annualreports).

## The WORD

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

The WORD is Carnegie Mellon University's student on-line catalog and is considered a supplement to the department (and sometimes college) catalog. 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

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

  - 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

Student's Rights  
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
- SafeWalk
- Survivor Support Network
- 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  
Statement of Assurance

## APPENDIX B: ADDITIONAL INFORMATION FOR CALIFORNIA PROGRAMS

Carnegie Mellon University is a private, non-profit institution, approved to operate in California by the California Bureau for Private Post-Secondary Education.

Any questions a student may have regarding this catalog that have not been satisfactorily answered by the institution may be directed to the Bureau for Private Postsecondary Education at 2535 Capitol Oaks Drive, Suite 400, Sacramento, CA 95833, [www.bppe.ca.gov](http://www.bppe.ca.gov), toll-free telephone number (888) 370-7589 or by fax (916) 263-1897.

As a prospective student, you are encouraged to review this catalog prior to signing an enrollment agreement. You are also encouraged to review the School Performance Fact Sheet, which must be provided to you prior to signing an enrollment agreement.

A student or any member of the public may file a complaint about this institution with the Bureau for Private Postsecondary Education by calling (888) 370-7589 toll-free or by completing a complaint form, which can be obtained on the bureau's internet website, at [www.bppe.ca.gov](http://www.bppe.ca.gov).

Class session will be held:

Carnegie Mellon University  
NASA Ames Research Park  
Bldg. 23 (MS 23-11)  
P.O. Box 1  
Moffett Field, CA 94035-0001  
(650) 603-7032  
[www.cmu.edu/silicon-valley](http://www.cmu.edu/silicon-valley)

### STUDENT'S RIGHT TO CANCEL (WITHDRAWAL/LEAVES OF ABSENCE)

1. A student has the right to cancel the student's Enrollment Agreement by either taking a leave of absence from the Program (leaving Carnegie Mellon University temporarily with the firm and stated intention of returning) or by withdrawing from the Program (leaving Carnegie Mellon University with no intention of returning). If the student withdraws or take a leave of absence from Carnegie Mellon University, the student may be eligible for a tuition adjustment or a refund of certain fees (excluding any Application Fee, Registration Fee and Enrollment Deposit, and any applicable Student Tuition Recovery Fund assessment).
2. To cancel the student's Enrollment Agreement and take a leave of absence or withdraw, the student must complete Carnegie Mellon University's Leave of Absence or Withdrawal form, as applicable, and return it to Carnegie Mellon University's Registrar's Office, at 5000 Forbes Ave., Warner Hall A12, Pittsburgh, PA 15213. The Leave of Absence and Withdrawal forms, and additional information of leaves of absence and withdrawal, can be found on Carnegie Mellon University's website, at <https://www.cmu.edu/hub/docs/loa.pdf>.
3. If the student notifies Carnegie Mellon University of the student's intent to withdraw or take a leave of absence, the student's official date of withdrawal or leave of absence is the earliest of:

The date the student began the student's withdrawal or leave of absence process at Carnegie Mellon University; The date the student notified the student's home department at Carnegie Mellon University;

The date the student notified the associate dean of the student's College at Carnegie Mellon University; or

The date the student notified the Carnegie Mellon University Dean of Student Affairs.

If the student does not notify Carnegie Mellon University of the student's intent to withdraw or take a leave of absence, the student's official date of withdrawal or leave of absence is:

The midpoint of the relevant semester in which the student withdraws or takes a leave of absence;

The last date the student attended an academically-related activity such as an exam, tutorial or study group, or the last day the student turned in a class assignment.

## REFUND POLICY

1. **Refunds in General.** Students who withdraw from the Program or take a leave of absence after having paid the current semester's tuition and fees or receiving financial aid are subject to the following refund and repayment policies. No other charges are refundable. Student Tuition Recovery Fund assessment, if any, is non-refundable.
2. **Exit Counseling.** All borrowers of Federal student loans must complete a Federally-mandated exit counseling session when graduating or dropping to less than half-time enrollment status, including by withdrawing or taking a leave of absence. Exit counseling prepares students for repayment. Students must complete an exit counseling session in its entirety, with complete and correct information; otherwise, the student's degree, diploma and official transcripts may be withheld. Information about exit counseling sessions can be found on Carnegie Mellon University's website, at <https://www.cmu.edu/sfs/financial-aid/exit-counseling.html>.
3. **Withdrawals/Leaves On or Before 10<sup>th</sup> Class Day.** Students who withdraw or take a leave of absence on or before the 10th class day of the relevant semester may receive a refund of 100% of tuition and fees (excluding any Application Fee or Registration Fee and Enrollment Deposit). STRF assessment, in any, is non-refundable.
4. **Withdrawals/Leaves after 10<sup>th</sup> Class Day.** Students who withdraw or take a leave of absence after the 10<sup>th</sup> class day of the relevant semester but before completing 60% of the semester will be assessed tuition based on the number of days completed within the semester. This includes calendar days, class and non-class days, from the first day of classes to the last day of final exams. Breaks which last five days or longer, including the preceding and subsequent weekends, are not counted. Thanksgiving and Spring Break are not counted. There is no tuition adjustment after 60% of the semester is completed. There is no refund of fees after the 10<sup>th</sup> class day of the relevant semester.

5. **Tuition Adjustment Appeals.** Students may appeal to have tuition adjustments for their leave of absence or withdrawal if they feel that they have extenuating circumstances. These appeals will be reviewed in the context of Carnegie Mellon University's tuition adjustment policy, as stated above. These appeals must be made in writing to Carnegie Mellon University's Registrar using Carnegie Mellon University's Tuition Appeal Adjustment form. Information about Carnegie Mellon University's tuition adjustment policy, and tuition adjustment appeals, can be found on Carnegie Mellon University's website, at <https://www.cmu.edu/sfs/tuition/adjustment/index.html>.
6. **Repayment to Lenders/Third Parties.** If any portion of refundable tuition and/or fees was paid from the proceeds of a loan or third party, the refund may be sent to the lender, third party or, if appropriate, to the Federal or state agency that guaranteed or reinsured the loan, as required by law and/or Carnegie Mellon University policy. Any amount of the refund in excess of the unpaid balance of the loan shall be first used to repay any student financial aid programs from which the student received benefits, in proportion to the amount of the benefits received, and any remaining amount shall be paid to the student.
7. **Responsibility for Loan.** If the student obtains a loan to pay for an educational program, the student will have the responsibility to repay the full amount of the loan plus interest, less the amount of any refund. If the student has received Federal student financial aid funds, the student is entitled to a refund of moneys not paid from Federal student financial aid program funds. If the student is eligible for a loan guaranteed by the Federal or state government and the student defaults on the loan, both of the following may occur: 1) The Federal or state government or a loan guarantee agency may take action against the student, including applying any income tax refund to which the person is entitled to reduce the balance owed on the loan. 2) The student may not be eligible for any other Federal student financial aid at another institution or other government assistance until the loan is repaid.

Meeting the cost of a graduate education is a significant investment. Carnegie Mellon University is committed to making it financially possible for graduate students to enhance educational development and reach their career goals. There are many financial aid resources available to students pursuing graduate studies at Carnegie Mellon University. Carnegie Mellon University participates in a number of Federal and state financial aid programs. Information about these financial aid programs can be found on Carnegie Mellon University's website, at <http://www.cmu.edu/finaid/index.html>.

If you obtain a loan to pay for the M.S. in Electrical and Computer Engineering or Software Engineering degree programs on the Silicon Valley campus, you will have the responsibility to repay the full amount of the loan plus interest, less the amount of any refund. If you have received federal student financial aid funds, you are entitled to a refund of moneys not paid from federal student financial aid program funds.

Carnegie Mellon University does not have a pending petition in bankruptcy, is not operating as a debtor in possession, and has not filed a petition in bankruptcy within the preceding 5 years, nor has Carnegie Mellon had a petition in bankruptcy filed against it within the preceding 5 years that resulted in re-organization under Chapter 11 of the United States Bankruptcy Code.

The State of California established the Student Tuition Recovery Fund (STRF) to relieve or mitigate economic loss suffered by a student in an educational program at a qualifying institution, who is or was a California resident while enrolled, or was enrolled in a residency program, if the student enrolled in the institution, prepaid tuition, and suffered an economic loss. Unless relieved of the obligation to do so, you must pay the state-imposed assessment for the STRF, or it must be paid on your behalf, if you are a student in an educational program, who is a California resident, or are enrolled in a residency program, and prepay all or part of your tuition.

You are not eligible for protection from the STRF and you are not required to pay the STRF assessment, if you are not a California resident, or are not enrolled in a residency program.

It is important that you keep copies of your enrollment agreement, financial aid documents, receipts, or any other information that documents the amount paid to the school. Questions regarding the STRF may be directed to the Bureau for Private Postsecondary Education, 2535 Capitol Oaks Drive, Suite 400, Sacramento, CA 95833, (916) 431-6959 or (888) 370-7589.

To be eligible for STRF, you must be a California resident or are enrolled in a residency program, prepaid tuition, paid or deemed to have paid the STRF assessment, and suffered an economic loss as a result of any of the following:

1. The institution, a location of the institution, or an educational program offered by the institution was closed or discontinued, and you did not choose to participate in a teach-out plan approved by the Bureau or did not complete a chosen teach-out plan approved by the Bureau.
2. You were enrolled at an institution or a location of the institution within the 120 day period before the closure of the institution or location of the institution, or were enrolled in an educational program within the 120 day period before the program was discontinued.
3. You were enrolled at an institution or a location of the institution more than 120 days before the closure of the institution or location of the institution, in an educational program offered by the institution as to which the Bureau determined there was a significant decline in the quality or value of the program more than 120 days before closure.
4. The institution has been ordered to pay a refund by the Bureau but has failed to do so.
5. The institution has failed to pay or reimburse loan proceeds under a federal student loan program as required by law, or has failed to pay or reimburse proceeds received by the institution in excess of tuition and other costs.
6. You have been awarded restitution, a refund, or other monetary award by an arbitrator or court, based on a violation of this chapter by an institution or representative of an institution, but have been unable to collect the award from the institution.
7. You sought legal counsel that resulted in the cancellation of one or more of your student loans and have an invoice for services rendered and evidence of the cancellation of the student loan or loans.

To qualify for STRF reimbursement, the application must be received within four (4) years from the date of the action or event that made the student eligible for recovery from STRF.

A student whose loan is revived by a loan holder or debt collector after a period of noncollection may, at any time, file a written application for recovery from STRF for the debt that would have otherwise been eligible for recovery. If it has been more than four (4) years since the action or

event that made the student eligible, the student must have filed a written application for recovery within the original four (4) year period, unless the period has been extended by another act of law.

However, no claim can be paid to any student without a social security number or a taxpayer identification number.

**NOTICE CONCERNING TRANSFERABILITY OF CREDITS AND CREDENTIALS EARNED AT OUR INSTITUTION** The transferability of credits you earn at Carnegie Mellon University is at the complete discretion of an institution to which you may seek to transfer. Acceptance of the M.S. degree you earn in Electrical and Computer Engineering or Software Engineering is also at the complete discretion of the institution to which you may seek to transfer. If the credits or degree that you earn at this institution are not accepted at the institution to which you seek to transfer, you may be required to repeat some or all of your coursework at that institution. For this reason you should make certain that your attendance at this institution will meet your educational goals. This may include contacting an institution to which you may seek to transfer after attending Carnegie Mellon University to determine if your credits or degree will transfer.

Meeting the cost of a graduate education is a significant investment. Carnegie Mellon University is committed to making it financially possible for graduate students to enhance educational development and reach their career goals. There are many financial aid resources available to students pursuing graduate studies at Carnegie Mellon University. Carnegie Mellon University participates in a number of Federal and state financial aid programs. Information about these financial aid programs can be found on Carnegie Mellon University's website, at <http://www.cmu.edu/finaid/index.html>.

Carnegie Mellon University is accredited through a voluntary, peer-review process coordinated by the Middle States Commission on Higher Education (MSCHE or Middle States). MSCHE is one of six regional accrediting agencies in the United States, each accrediting institutions of higher education within a specific geographic region. Middle States is recognized by the U.S. Department of Education. This recognition enables MSCHE's member institutions to establish eligibility to participate in federal financial aid programs (e.g., federal loans, grants, and work-study) administered by the U.S. Department of Education. Carnegie Mellon University has been accredited by Middle States since 1921.

Please visit <http://www.cmu.edu/middlestates/> to learn more about accreditation standards and processes and to view the University's reaccreditation reports.

The address and telephone number for the Middle States Commission on Higher Education is 3624 Market Street, 2nd Floor West, Philadelphia, PA 19104, (267) 284-5000.

Appendix last updated: February 28, 2018



5000 Forbes Avenue

Pittsburgh, PA 15213

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

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