



**Energy Science
Technology & Policy**
Carnegie Mellon University
College of Engineering

Energy Science, Technology and Policy Master's Program

Graduate Student Handbook

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Energy Science, Technology and Policy Master's Program
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EST&P GRADUATE STUDENT HANDBOOK

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I) Welcome and Introduction

The Faculty and Staff of the Energy Science, Technology and Policy (EST&P) program welcome you to Carnegie Mellon University (CMU). EST&P is an interdisciplinary Master of Science degree program in the College of Engineering and is an educational initiative of the CMU Scott Institute for Energy Innovation. The three EST&P degrees proudly build upon the significant accomplishments in energy by CMU faculty, researchers, students, and graduates.

Why EST&P:

Effective solutions to energy problems will come from engineers and technical managers who understand the interdisciplinary challenges of energy, and who are well informed on the broad issues of energy supply, demand, storage, utilization, policy, economics, sustainability, and the environment. EST&P addresses this need with distinctive Master of Science degrees based in engineering, aligned with new discoveries in science, attuned to sustainability and the environment, and informed by a broader perspective in economics and public policy.

As a professional master's degree program, EST&P is oriented towards professional career preparation and the three MS degrees are awarded for successful completion of all required coursework. All EST&P graduates share core knowledge from four required courses: Energy Conversion & Supply, Energy Transport & Storage, Energy Demand & Utilization, and Energy Policy & Economics (24 units). Engineering depth is assured through a disciplinary concentration that sets the template for approximately a third of the degree coursework (36 units). Customization and individualization is achieved through breadth electives (36 units). For the Applied Studies degree, further customization and application of knowledge to real world problems occurs in the independent project work or project intensive coursework (24 units). The Integrated Studies in Computer Science degree allows you to build off of your prior experience in programming and implement and practice advanced computational-based methods applied to engineering problems in the energy sector.

EST&P graduates pursue diverse careers where they can lead in the development of new technologies and policies for the production, transport, and efficient use of energy. The curriculum is designed to prepare you for a position of responsibility in energy sectors including: traditional energy utilities and suppliers, alternative and renewable energy, power generation and distribution, energy intensive manufacturing, energy efficiency and sustainability practices, consulting companies, government labs, non-profits, and academic institutions.

Graduate Student Handbook:

This handbook will guide and inform your opportunities and choices in the EST&P program. It contains detailed information about EST&P degree requirements, policies, and procedures, and it supplements the [College of Engineering graduate policies](#) and the [University policies](#). As you join us in this tenth year of CMU's Energy master's program, we hope you have a productive and rewarding academic year, and that you will not hesitate to contact us with any questions.

II) EST&P Degree Options and Requirements

A) Overview of EST&P Degree Options

The College of Engineering EST&P program offers three coursework based professional master's degrees in energy:

- The **M.S. in Energy Science, Technology and Policy (EST&P)** is a degree that requires 96 units of coursework and is completed in two semesters of full-time study.
- The **M.S. in Energy Science, Technology and Policy - Applied Studies (EST&P-AS)** is a degree requires 120 units of coursework (including 24-units of project) and is completed in three semesters of full-time study.
- The **M.S. in Energy Science, Technology and Policy –Applied Studies and Integrated Study in Computer Science (EST&P-CS)** is a 168 unit degree that includes 24 units of project, 60 units in Computer Science, and is completed in four semesters of full-time study.

Prospective students apply to and receive admission offers for one of the three EST&P degrees and one of the six disciplinary concentrations within the EST&P program. Prospective students apply to and receive admission offers directly from the College of Engineering's EST&P program, not one of the affiliated engineering departments. Current students (already admitted to EST&P-AS) CAN NOT switch into the EST&P-AS-CS degree.

All EST&P degrees require a minimum of 96-units of coursework in three categories: Energy Core, Disciplinary Concentration, and Breadth Electives. The EST&P-AS degree requires 24 units of project work and 120 total units. The EST&P-CS degree builds off the EST&P-AS degree and requires 60 units of computer science coursework, with 24 units of required computer science core and 36 units of computer science disciplinary concentration, and 168 total units. The three degrees are compared in the following table. The figures on the following pages graphically illustrate the basic requirements for the three degrees. Further details are given on the pages that follow the figures.

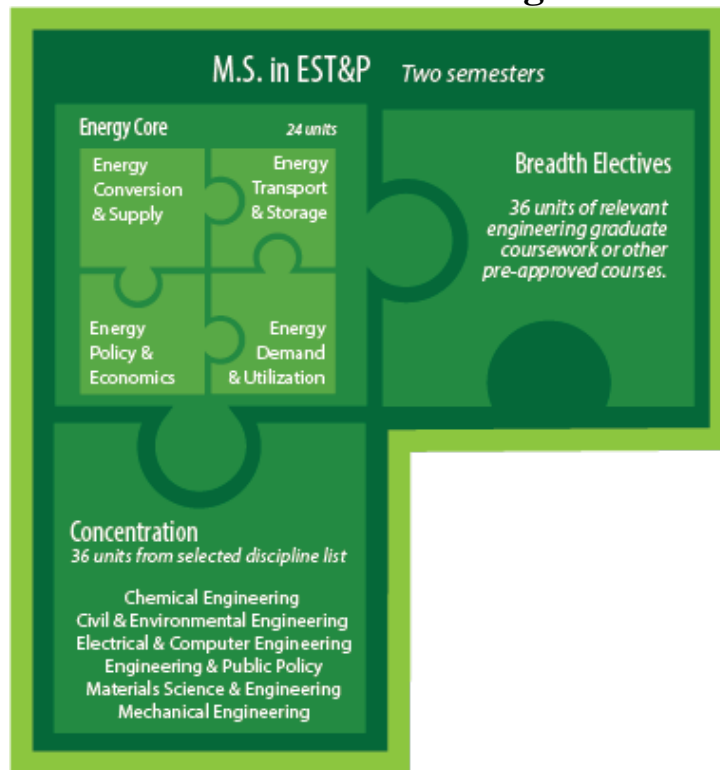
Energy Science, Technology & Policy (EST&P) Degrees

| EST&P Degree (Energy Science, Technology & Policy) | EST&P-AS Degree (EST&P - Applied Studies) | EST&P-CS Degree (EST&P-AS and Integrated Study in Computer Science) |
|--|--|--|
| Master of Science (M.S.) | Master of Science (M.S.) | Master of Science (M.S.) |
| 2 semesters of full-time study | 3 semesters of full-time study | 4 semesters of full-time study |
| 96 total units: | 120 total units: | 168 total units: |
| 96 units EST&P coursework: <ul style="list-style-type: none"> ○ 24 units of required energy core courses: 39-610, -611, -612, -613 ○ 36 units of disciplinary concentration courses: approved courses are set by each concentration department (CHE, CEE, ME, MSE, EPP, ECE) ○ 36 units of breadth elective courses: <ul style="list-style-type: none"> * advisor approved * graduate level courses in engineering * 18 units max of limited non-engineering graduate classes related to energy (Tepper, Heinz, CS, MCS, Architecture) * Up to 12 units of Master's Project / Independent Study | 96 units EST&P coursework: <ul style="list-style-type: none"> ○ 24 units of required energy core courses: 39-610, -611, -612, -613 ○ 36 units of disciplinary concentration courses: approved courses are set by each concentration department (CHE, CEE, ME, MSE, EPP, ECE) ○ 36 units of breadth elective courses: <ul style="list-style-type: none"> * advisor approved * graduate level courses in engineering * 18 units max of limited non-engineering graduate classes related to energy (Tepper, Heinz, CS, MCS, Architecture) * Up to 12 units of Master's Project / Independent Study | 96 units EST&P coursework: <ul style="list-style-type: none"> ○ 24 units of required energy core courses: 39-610, -611, -612, -613 ○ 36 units of disciplinary concentration courses: approved courses are set by each concentration department (CHE, CEE, ME, MSE, EPP, ECE) ○ 36 units of breadth elective courses: <ul style="list-style-type: none"> * advisor approved * graduate level courses in engineering * 18 units max of limited non-engineering graduate classes related to energy (Tepper, Heinz, CS, MCS, Architecture) * Up to 12 units of Master's Project / Independent Study |
| | 24 units M.S. Project <ul style="list-style-type: none"> ○ 24 units of master's project work: <ul style="list-style-type: none"> * may include independent study, internship, and pre-approved project courses * project courses may satisfy more than one requirement, but a total of 120 EST&P units is required | 24 units M.S. Project <ul style="list-style-type: none"> ○ 24 units of master's project work: <ul style="list-style-type: none"> * may include independent study, internship, and pre-approved project courses * project courses may satisfy more than one requirement, but a total of 120 EST&P units is required |

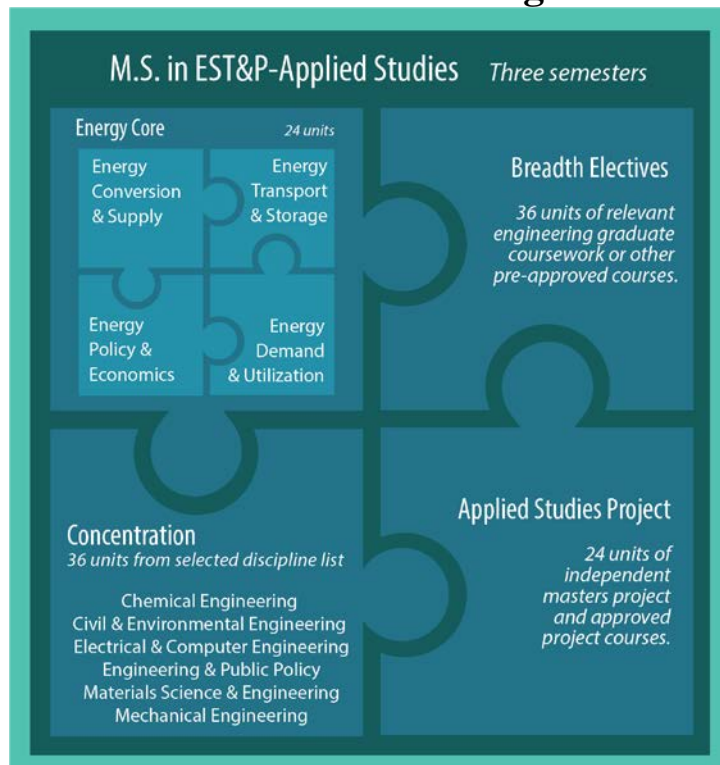
Energy Science, Technology & Policy (EST&P) Degrees (continued)

| EST&P Degree | EST&P-AS Degree | EST&P-CS Degree |
|--------------|-----------------|---|
| | | <p>60 units CS coursework</p> <ul style="list-style-type: none"> ○ 24 units of required computer science core full semester courses: 15-513 and 17-514 ○ 36 units of computer science disciplinary concentration: <ul style="list-style-type: none"> * approved courses set by the School of Computer Science * Up to 12 units of approved CS disciplinary concentration units may be counted as EST&P breadth elective. |

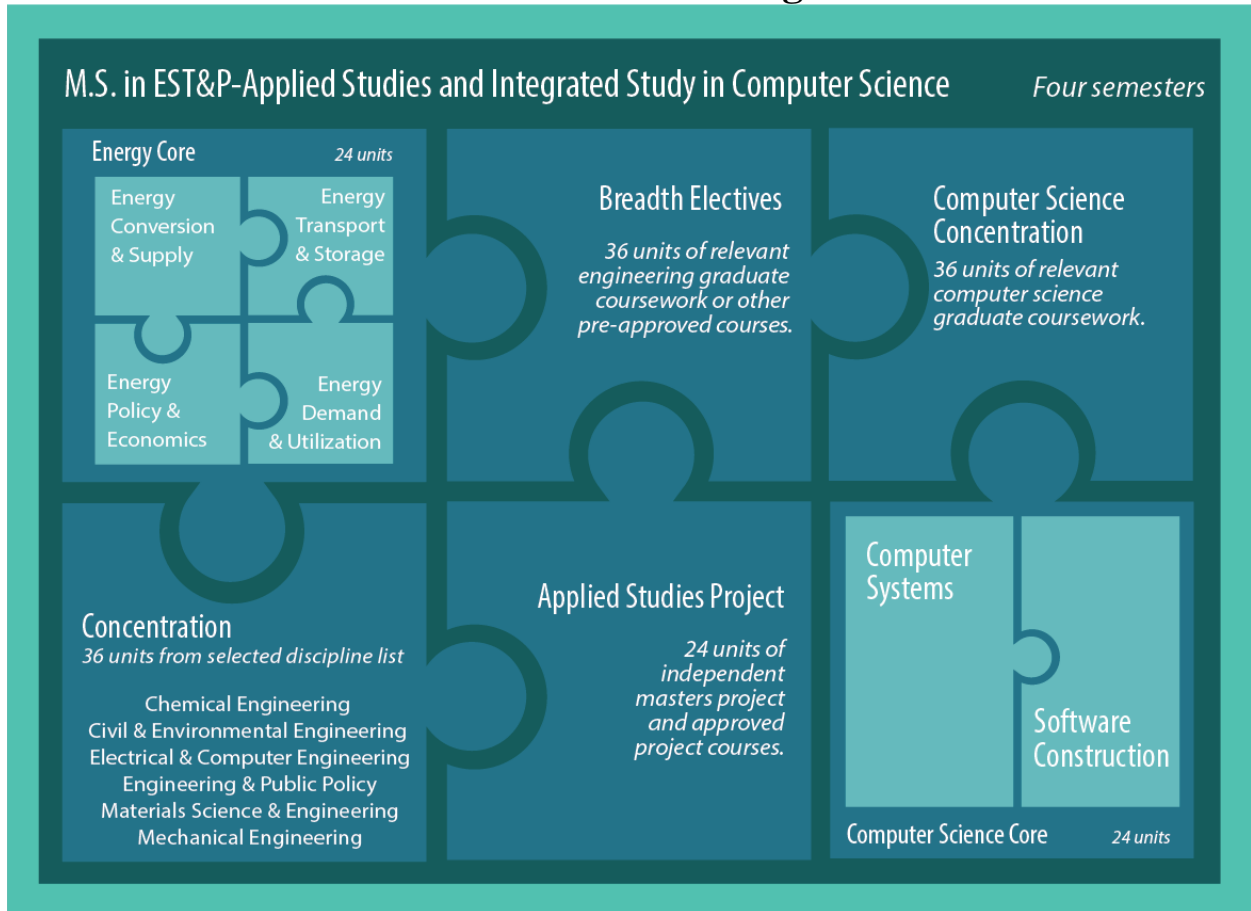
EST&P Master of Science Degree



EST&P-Applied Studies Master of Science Degree



EST&P-Applied Studies and Integrated Study in Computer Science Master of Science Degree



B) EST&P Course Categories and Policies

Core Energy Category (24 total units of required coursework):

Students in all EST&P degrees must take the following four core courses.

1. 39-610 Energy Conversion and Supply (6 units, mini 1)
2. 39-613 Energy Transport and Storage (6 units, mini 2)
3. 39-611 Energy Demand and Utilization (6 units, mini 3)
4. 39-612 Energy Policy and Economics (6 units, mini 4)

Disciplinary Concentration Category (36 units):

Students in all EST&P degrees must select one of six engineering disciplinary concentrations when applying for admission. The disciplinary concentration sets the template for engineering depth coursework. Note that the concentration is not listed in the degree title and it does not appear on diplomas or transcripts.

Each participating engineering department has identified the courses that are approved to fulfill their concentration requirement. ONLY the departmentally approved courses will count towards meeting the disciplinary concentration degree requirement. Concentrations may include both required and elective courses, and vary in structure from department to department. For complete details please refer to Appendix A of this Handbook and/or pages on the EST&P Website: (www.cmu.edu/engineering/estp/degree-programs)

Links for the individual concentrations are given here:

- [Disciplinary concentration in Chemical Engineering](#)
- [Disciplinary concentration in Civil and Environmental Engineering](#)
- [Disciplinary concentration in Electrical and Computer Engineering](#)
- [Disciplinary concentration in Engineering and Public Policy](#)
- [Disciplinary concentration in Materials Science and Engineering](#)
- [Disciplinary concentration in Mechanical Engineering](#)

The EST&P program works with concentration departments to maintain these lists of approved courses. If courses become available that are not listed in the disciplinary concentrations, please consult your Academic Advisor to discuss the potential inclusion of new courses.

For students that have concerns regarding their disciplinary concentration, it is their responsibility to consult with their Academic Advisor.

Breadth Elective Category (36 units):

Students in all EST&P degrees must take an additional 36 units of graduate level College of Engineering classes, or approved alternatives discussed below, as [breadth electives](#). Students are encouraged to take breadth electives from outside the department associated with their disciplinary concentration. These breadth electives allow for significant customization of the degree toward the specific interests of individual students, and standard policies are listed below. Selection of breadth elective courses is generally made in consultation with an EST&P academic advisor.

Most engineering graduate courses are acceptable as EST&P breadth electives. Graduate courses that satisfy this requirement must not have significant overlap with other courses taken by the student.

Breadth Elective Category (36 units)- continued

Up to 12 units of advisor-approved upper-level undergraduate coursework (400 or 500 level) can be applied toward the breadth elective requirement, when the course is needed as preparation for a graduate class. Classes at the 300 level and below do not count towards the EST&P degree.

Advanced written advisor approval is required.

Up to 18 units of pre-approved graduate level classes at Carnegie Mellon, outside the College of Engineering, can be applied toward the breadth elective requirement. **Advanced written advisor approval is required.** Students in the EST&P-CS degree may count up to 12 units of approved CS disciplinary concentration courses for the breadth elective requirement. All students are **limited** to 18 units of breadth electives from outside the college. EST&P and EST&P-AS students are **limited** to one SCS course per semester.

A maximum of 12 units of advisor-approved directed research / independent study / master's project can be applied toward the 36-unit breadth elective requirement. This is usually taken as 39-660, or equivalent master's project courses in affiliated disciplinary concentrations. To count towards the breadth elective requirement, a factorable letter grade must be assigned for the course. **Advanced written advisor approval is required.** Additionally, **advanced written approval by the supervising faculty member is required.**

A master's project approval request form is available on Canvas. It must be submitted to the EST&P Academic Advisor by the fifth day of classes, and written (email) response will be provided within four business days. (The typical add deadline is the tenth business day of the semester, allowing the project course to be added appropriately.) This form requires a 1-page plan of study describing the project topic, expected outcomes, deliverables and the method of evaluation. This form must be signed by both the student and the supervising College of Engineering faculty member. The completed form will then allow the student to be registered for the appropriate number of units of EST&P master's project course number 39-660. Where a similar process or course number exists in the supervising faculty member's home department, that procedure may optionally be followed. However, copies of the completed departmental form must be submitted to the EST&P office to be included in a student's permanent records.

Applied Studies Project Category (24 units):

EST&P-AS and EST&P-CS students must take an additional 24-units of applied studies project work. These units must be pre-approved and may include (but are not limited to): project-intensive engineering courses, EST&P master's project 39-660 (or similar master's project units in affiliated departments), or appropriately supervised internships.

For any independent study project units to count towards the degree requirements, a factorable letter grade must be assigned to a pre-approved specific course. In all cases, **advanced written advisor approval is required.** For independent projects, **advanced written approval by the supervising faculty member is required.** For independent projects, this is done by filling out the **EST&P master's project approval form**, which must be **signed first by the supervising faculty member and then approved by an EST&P advisor.**

Examples and policies for meeting the EST&P-AS project work requirement are given on the following two pages.

Applied Studies Project Category (24 units): continued

Project-Intensive Engineering Courses:

With advance approval from an EST&P advisor, regularly scheduled project-intensive engineering classes may count towards meeting the EST&P-AS project 24-unit requirement. An up-to-date list is available on Canvas, and examples include:

- 24-722 Energy System Modeling
- 24-618 Computational Analysis of Transport Phenomena
- 12-761 Sensing & Data Mining in Smart Structures and Systems
- 12-718 Environmental Engineering, Sustainability and Science Project
- 12-745 Advanced Infrastructure Systems Project
- 39-605 / 39-606 Engineering Design Projects
- 18-500 ECE Design Experience, 12 units (counting also as the 12 allowed undergraduate units)

In cases where project intensive courses satisfy both disciplinary concentration and project work degree requirements, they can be used to satisfy both; however, the total unit count for the EST&P-AS and EST&P-CS degree requirements must be met at 120 and 168 units, respectively. Typically this is met by taking another approved breadth elective course.

Independent Master's Project Work:

A maximum of 24 units of advisor-approved directed research / independent study / master's project can be applied toward the 24-unit EST&P-AS project requirement. This is usually taken as 39-660, or as the equivalent master's project courses in affiliated departments. To count towards the EST&P-AS project requirement, a factorable letter grade must be assigned for the course. **Advanced written advisor approval is required.** Additionally, **advanced written approval by the supervising faculty member is required.**

Carnegie Mellon faculty are engaged in a wide range of energy related research, in which undergraduate, master's, and doctoral students participate. EST&P students interested in independent project work are encouraged to explore research areas and opportunities on campus by reading the web-pages of EST&P affiliated departments, institutes, and faculty, discussing with EST&P advisors and students, and discussing with individual faculty. Independent project opportunities can be found through agreement with individual College of Engineering faculty members. Once identified and approved by the student, supervising faculty, and EST&P advisor, students will then sign up for 39-660 EST&P Master's Project units, or an equivalent Master's Project or Independent Study course in the supervising faculty member's department.

Approval is obtained by filling out the **EST&P master's project approval form**, available on Canvas. This form must be **signed first by the student and the supervising faculty member, and then approved by an EST&P advisor.** It must be submitted to the EST&P Academic Advisor by the fifth day of classes, and written (email) response will be provided within four business days. (The typical add deadline is the tenth business day of the semester, allowing the project course to be added appropriately.) This form requires a 1-page plan of study describing the project topic, expected outcomes, deliverables and the method of evaluation. The completed form will then allow the student to be registered for the appropriate number of units of EST&P master's project course number 39-660. Where a similar process or course number exists in the supervising faculty member's home department, that procedure may optionally be followed. However, copies of the completed departmental form must be submitted to the EST&P office to be included in a student's permanent records.

Applied Studies Project Category (24 units): continued

Internships:

With advanced advisor and supervising faculty approval, students on summer internship may register and pay for three or more units of 39-660 EST&P Master's Project or equivalent. These units may count towards the Applied Studies project requirement. To count towards the degree requirements, project / course supervision must be provided by an EST&P advisor or affiliated faculty member, a final report must be submitted, and a factorable letter grade must be assigned. All policies described above for project Independent Project Work apply.

Computer Science Core Category (24 units):

EST&P-CS students must take twenty-four units of required Computer Science core full semester courses (12 units each):

1. 15-513 Introduction to Computer Systems
2. 17-514 Principles of Software Construction: Objects, Design, and Concurrency

These two courses must be taken in the first two semesters (one each) of a student's program.

Computer Science Disciplinary Concentration Category (36 units):

EST&P-CS students must take an additional 36 units of graduate level Computer Science concentration courses. These are sets of courses approved by the School of Computer Science. Choosing Computer Science courses should be made in consultation with your EST&P-CS advisor(s). Up to 12 of these CS Concentration units can be counted towards the Breadth Elective Category, upon EST&P advisor approval.

C) Course Registration, Full/Part-Time Status, & Practical Training

Course registration:

Course registration is accomplished through CMU's Student Information Online (SIO) system, accessible through the HUB website. Students are responsible for enrolling in required core courses, pre-approved disciplinary concentration courses, pre-approved breadth electives, and appropriate project work. Students are encouraged to register as early as possible to reduce the chances of being wait-listed in a desired course. Students should refer to the University calendar for official registration dates (mid-November for Spring registration; mid-April for Fall registration - www.cmu.edu/hub/calendar.html).

Before beginning online registration, please carefully review the degree and course requirements summarized in Sections III, IV, and VII (Appendix A) of this handbook. The EST&P degrees have been incorporated into the developing Stellic system; students' degrees and concentrations can be planned, tracked, and audited within Stellic, once fully developed. Pay attention to required courses in your disciplinary concentration. Be aware that most graduate courses are taught only once per academic year. The EST&P Director and Associate Director serve as academic advisors for the program. Academic advisors are available to help students choose courses that meet both stated degree requirements and their personal / professional objectives.

Add / Drop Policies / Deadlines:

Students can modify their registered schedule by adding / dropping courses up until the add/drop deadline. Students taking undergraduate and Master's level courses must follow the procedures and deadlines for adding, dropping, or withdrawing from courses as identified on the academic calendar. Information can be found at <https://www.cmu.edu/hub/registrar/course-changes/index.html>. There is a separate calendar for doctoral level courses. As a courtesy to others, students should drop a course as soon as they decide not to take it. This may allow a waitlisted student to be enrolled and will limit the disruption to any team-based projects.

Add / drop deadlines are usually at the end of the first week of classes, for mini courses, or at the end of the first 10 days of classes, for semester long courses. Add / drop deadlines for engineering courses follow the university wide academic calendar, and specific deadline dates can be found here: <http://www.cmu.edu/hub/calendar.html>. Courses in the Heinz School (policy), Tepper School (business), and School of Computer Science often have their own unique academic calendars (including for add, drop, audit, and pass/fail deadlines), which is often different from the university academic calendar. In addition, doctoral (PhD) level courses may have different add / drop deadlines: such courses are department identified in SIO. EST&P students must adhere to all course-specific deadlines.

A Late Drop Voucher system also exists: the Late Drop Voucher system permits students one late drop voucher during their degree. A late drop voucher allows a student to drop a course after the drop deadline, a so-called "late drop", without a W (for withdrawal) showing on their transcript.

Students should always consult their academic advisor for details and to check the impact that specific add / drop events have on progress towards graduation and student status.

Full-time student status:

Unless admitted as a part-time degree-seeking student, all EST&P students are required to register as a full-time student each semester. Full-time CMU students must register for a minimum of 36 units. Students in the EST&P degree program complete their degree in two full-time semesters of 48 units per semester. Students in the EST&P-AS degree (Applied Studies) complete their degree in three semesters of full-time study with a typical course load of 42 units per semester. Students in the EST&P -CS degree (Applied Studies and Integrated Study in Computer Science) complete their degree in four semesters of full-time study with a typical course load of 42 units per semester. Details on minimum and maximum units are given in Section III(D).

Part-time student status:

Part-time MS EST&P enrollment is an option available for students who have applied and received admission to a part-time degree program of study. This option is made available for students who would like to pursue the EST&P or EST&P-AS degree while maintaining external employment. Note that immigration regulations do not allow Carnegie Mellon University to issue F1 visa documents to a part-time MS degree-seeking student.

Practical Training:

International students in good standing after two full-time semesters in the EST&P-AS or EST&P-AS-CS degree program may be eligible for a Curricular Practical Training (CPT) summer internship. During a CPT internship, the student must register for a minimum of three units of Master's Project / Internship coursework. These units will count towards your degree. Tuition must be paid for these units, and they will be billed at the part-time per-unit graduate tuition rate. International students who enter EST&P in the Spring semester are not eligible (a US student visa regulation) for a CPT in the summer, as they will have only completed one full-time semester by summer.

Pre-completion OPT (Optional Practical Training) is available to international students for US off-campus summer internships, as an alternative to CPT. Students must apply early in spring semester to receive timely OPT approval. Summer course registration is not necessary for OPT.

In either case, international students must consult with the Office of International Education (OIE) for eligibility before seeking an internship or signing an offer contract.

D) Program, Student Status, and Financial Policies

Typical Completion Timelines:

Students typically begin the program in the Fall Semester and graduate at the end of either: their first Spring semester (EST&P degree, 2 semesters), their second Fall semester (EST&P-AS degree, 3 semesters), or their second Spring semester (EST&P-AS-CS, 4 semesters). However, all degree programs can also be completed by entering in the Spring semester, with completion timelines shifting appropriately.

Deferred Admission Policy:

At the time of the admission offer, EST&P applicants may petition to defer admission for one semester or one academic year. A petition form submitted to EST&P and a written (email) decision will be returned to the applicant within 14 days. After the deadline to accept or defer admission has passed, applicants wishing to be reconsidered must reapply for admission. In such cases, EST&P sponsors the application fee, and will re-use any official tests scores, transcripts, and other documentation sent in support of the original application, if the applicant chooses.

Switching Degree Programs:

Admitted students that have already accepted admission but wish to change between the EST&P and the EST&P-AS degrees must follow the procedures to transfer to another CMU degree program. The student must apply to the new degree by the posted admission deadline (the EST&P program sponsors the application fee, and will re-use any official tests scores, transcripts, and other documentation sent in support of the original application). The student's application will be reviewed by the appropriate admissions committee. If admission is granted to the new degree, then the necessary degree change paperwork is submitted to the registrar and OIE, as appropriate. Note that current EST&P and EST&P-AS students CANNOT switch into the EST&P-CS degree.

Minimum and Maximum Units per Semester:

Full-time CMU student status requires registering for a minimum of 36 units per semester. However, the minimum course load for full-time students enrolled in the EST&P degree is 48-units of degree satisfying courses per semester, thereby enabling the completion of the 96-unit degree requirement in the allotted two semesters. The minimum course load for full-time students enrolled in the EST&P-AS or EST&P-AS-CS degrees is 42-units of degree satisfying courses per semester, thereby enabling the completion of the 120 or 168-unit degree requirement in the allotted three or four semesters. Deviations from the minimum unit requirement must be approved by an EST&P academic advisor.

As required by F1 visa rules, international students must maintain full-time student status (i.e., registering for at least 36 units) in all semesters, including their last semester, and must make normal progress toward degree completion each semester. Therefore, international students are advised that a semester course load below 48 units towards the EST&P degree or 42 units towards the EST&P-AS or EST&P-AS-CS degrees can affect student visa status, because such students may be deemed as not making normal progress towards degree completion. Therefore, deviations from the minimum unit requirement must be approved by an EST&P academic advisor, after student consultation with the Office of International Education (OIE).

Minimum and Maximum Units per Semester: continued

An EST&P student's schedule is over-loaded when it exceeds 48 units per semester. Official audit or pass/fail units count toward full-time or overload status (but not towards degree requirements). To be eligible for an overload (exceeding 48 units per semester), students must petition their academic advisor for advance approval. An academic advisor will require a minimum Quality Point Average (QPA) of 3.6 or above, as of the prior CMU/EST&P semester.

Courses without Factorable Letter Grades:

Courses taken as "Audit" or "Pass-Fail" will not count toward EST&P degree requirements. Officially auditing a course means being present and participating in a class without receiving academic credit or a letter grade. To audit a course, one must first register for the course and then file a request for audit that requires program and instructor approval. The units of audited courses count toward the maximum course load units, but do not count toward degree requirements. A successfully completed audit course will appear on a transcript with an 'O' audit designation, which is not a factorable letter grade (it does not get factored into the QPA). The scope and extent of a student's participation must be arranged and approved by the course instructor in advance. Auditors are expected to attend class as though they are regular class member. Some faculty may require an auditor to submit homework and to participate in team project work. Students who do not attend the class regularly, or prepare themselves for class, or meet other instructor audit requirements will receive a blank grade.

Under **limited circumstances**, a student may be permitted to convert a course registration to Pass-Fail or Audit with appropriate advisor and instructor approval. To receive EST&P advisor approval, a student must submit a completed petition form that explains why they were taking coursework that does not count towards the degree. Please note that EST&P policy is to DECLINE advisor approval of Course Audit and Pass/Fail forms for any student registered for an overload schedule of more than 48 units. If a student decides they cannot complete a class for letter grade, they must drop the class in SIO prior to the "drop" deadline.

Master's Thesis:

Energy Science, Technology and Policy is a coursework-based professional master's program, and a Master's Thesis option is not available.

Graduate Transfer Credits:

Up to 12 units of graduate work completed at other universities may be considered for transfer credit, provided that the course work is part of a graduate program leading to the degree sought and that the grade in each course is 3.0 or greater. Transfer credit is not granted prior to admission to EST&P and are only approved after the student has satisfactorily completed at least 36 units of graduate courses at Carnegie Mellon. Transfer credit requests will be handled on a case by case basis, with special consideration to whether the transfer credits can be applied toward the EST&P degree requirements. Approval of transfer credits to CMU is not a guarantee that courses count towards the EST&P degree unit requirements. Transfer credits will not substitute for EST&P's core classes. CMU's policy on transfer credit evaluation can be found here: <https://www.cmu.edu/policies/student-and-student-life/transfer-credit-evaluation-and-assignment.html>

Cross-Registration/PCHE:

All full-time Carnegie Mellon graduate students have the option of taking one course per semester at any of the ten PCHE intuitions. EST&P students should discuss with their academic advisor any potential PCHE cross-registered courses for relevance / impact on the EST&P degree. In general, these courses are treated using the rules of graduate transfer units and the rules of courses taken outside the college of engineering. CMU's policy on cross-registration can be found here: <https://www.cmu.edu/hub/registrar/registration/cross/>

CMU Canvas System:

Most instructors use the CMU Canvas web service to manage course communications, assignments, and reference materials. Carnegie Mellon's Canvas homepage is: <https://cmu.instructure.com/>. Login credentials are the CMU single sign in credentials (Andrew ID credentials). Students are expected to check Canvas weekly and respond to requests for Canvas submissions appropriately. Students will also use Canvas to submit onboarding forms required by the program, to access the course syllabi repository, and to submit their resume if they wish to be included in the EST&P Resume Book.

EST&P uses Canvas for program and professional communications in a "course" entitled **EST&P Professional Resources ('19-'20)**. Students are automatically enrolled in the EST&P Professional Resources ('19-'20) "course". Please check this Canvas "course" frequently as it contains important program forms, program and course information, and career related postings. EST&P Professional Resources ('19-'20) will be updated throughout the academic year with announcements, calendar of events, professional resources about jobs and internships, program news and updates, energy links, and a discussion board.

Tuition and Cost of Attendance:

EST&P tuition is charged at the standard College of Engineering master's student rate. Students are billed each semester for one-half of the academic year graduate tuition. The current College of Engineering's graduate tuition and fees are posted on the HUB website's [Graduate Tuition & Fees page](#). An EST&P degree student will complete the program in two semesters of full-time study and must pay full-time tuition for two semesters (one academic year). An EST&P-AS degree student will complete the program in three semesters of full-time study and will pay for three semesters of full-time tuition (most likely with a modest increased rate for the 3rd semester tuition). An EST&P-CS degree student will complete the program in four semesters of full-time study and will pay for four semesters of full-time tuition (most likely with a modest increased rate for the second academic year). The overall cost of attendance is estimated for the College of Engineering on the Hub website [Itemized College of Engineering Cost of Attendance](#) page; costs include activity & technology fees, transportation, off-campus housing, health insurance, etc..

Financial Aid:

Students in the EST&P program are self-funded, are funded by their employer, or are funded by external scholarships, fellowships, and educational loans. General information on [financial assistance for engineering graduate students](#) is available on the College of Engineering site, as is additional information about [graduate student fellowships and assistantships](#). Graduate students should consult the graduate student financial aid information found on the HUB website: <https://www.cmu.edu/sfs/financial-aid/graduate/index.html>. Students will find the Graduate Financial Aid Guide, information about funding options, and how to apply for financial aid, as well as other helpful links. Those who find themselves in need of immediate funds for emergency situations should contact the Office of the Dean of Student Affairs (see also Appendix A) www.cmu.edu/student-affairs/index.html

Emergency Loans:

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

Taxes:

The deadline for local, state, and federal taxes is April 15. Questions about your tax status should be addressed to the [IRS](#) or the [Pennsylvania Department of Revenue](#). Although subject to federal taxes, student stipends are generally not assessed local or state taxes.

III) Academic Standards and Graduation Requirements

A) Course and Minimum QPA

For the 96-unit EST&P degree, the 120-unit EST&P-AS degree, or the 168 unit EST&P-CS degree, all courses that are counted towards the degree requirements must be taken for credit with a factorable letter grade assigned (e.g. A, B, C, D, R). All courses taken as audit or with pass/fail grading DO NOT COUNT towards the 96,120, or 168-unit degree requirement. For each course taken, the policies and procedures of the instructor, the department, and the college in which the course is offered must be followed by EST&P students. The grade assigned by the course professor / instructor is final and cannot be changed. The decision to use plus or minus grading is at the discretion of each course instructor. Mid-semester grades are optional, and Final Grades are posted online to SIO at the end of each semester.

Carnegie Mellon graduate students are graded on a letter grade scale, which can optionally include plus or minus designations at the discretion of the course instructor. The factorable letter grades (and numerical equivalent factor) should be interpreted as:

- A (4.0)-- Excellent; student work exceeds expectations
- B (3.0)-- Good; work is acceptable for an EST&P student
- C (2.0)-- Marginal; student work is not up to EST&P program standards
- D (1.0)-- Unacceptable work for an EST&P student, does not count towards the degree
- R (0.0)-- Unacceptable work for an EST&P student, does not count towards the degree

EST&P students, in any degree program, must maintain a minimum overall QPA of 3.0 (B) or above (in all courses that count towards the EST&P degree) and must maintain a minimum QPA over all of their required courses (including: 39-610, 39-611, 39-612, and 39-613; any additional courses required for the student's selected disciplinary concentration, for those in CHE, MSE, or MEG concentrations; and 15-513 and 17-514 for those in the EST&P-CS degree) of 3.0 (B) or above to remain in good academic standing and satisfy the requirements of the Master's Degree. Students with cumulative QPAs, or current semester QPAs, lower than 3.0 at the end of a semester are placed on academic probation. If a student obtains a grade below a C+ (2.3) in any required course, or a student has below a 3.0 QPA in their core courses, they will be immediately placed on academic probation. Students on academic probation are notified by an EST&P Program Advisor. Students on academic probation must increase their cumulative, current semester, or required course QPA to 3.0 or better during their next full-time academic semester.

No course with a grade lower than C (2.0) may be counted toward the Master's Degree requirements, and no required course (see above) with a grade lower than C+ (2.3) may be counted toward the Master's Degree requirements. When calculating the QPA to meet EST&P (EST&P-AS) (EST&P-AS-CS) graduation requirements, the average grade of the 96, 120, or 168 course units that meet the Core + Concentration + Breadth, Core + Concentration + Breadth + Project, or Core + Concentration + Breadth + Project + CS Core + CS Concentration requirements for the EST&P, EST&P-AS, or EST&P-CS degrees, respectively shall be at least a B — 3.0. If a student has taken more than 96, 120, or 168 total units within these categories for the distinct degrees, then the student may choose any of the 96, 120, or 168 units of the first 120, 144, or 192 units attempted to compute the grade average, providing the courses selected meet all degree requirements. Students must also maintain a minimum QPA of 3.0 (B) or above over all of their required courses including: 39-610, 39-611, 39-612, and 39-613; any additional courses required for the student's selected disciplinary concentration, for those in CHE, MSE, or MEG concentrations; and 15-531 and 17-514 for those in the EST&P-CS degree.

B) Academic Probation

At the end of each semester, after grades have been posted, the academic performance of each student is reviewed. Courses that negatively affect the QPA cannot be removed from the requirement unless another completed course can replace the course with the lower grade, and the student has not reached the maximum number of total units. The QPA for academic review is computed based on the guidelines for graduation requirements.

Any student with a Required Course QPA of less than 3.0, or with a Cumulative QPA of less than 3.0, or with a QPA of less than 3.0 in the most recently completed full semester is immediately placed on academic probation. Additionally, if a student obtains a grade below a C+ (2.3) in any required course, they will be immediately placed on academic probation. The student will receive an electronic notification (email) of their academic probation status, including a description of the specific terms of their probation and the timeframe and requirements to remove probation. All students on probation are subject to the following sanctions:

- The student cannot receive an alumni or director scholarship or program support;
- The student cannot be selected to receive awards, travel / conference funding, etc.;
- The student may not formally represent EST&P as an officer or other positions in a student club or campus organization;

In most cases, a student on academic probation will automatically be removed from probationary status at the end of the subsequent enrolled semester if they qualify to do so. If an EST&P student has a Required Course or Cumulative QPA lower than 3.0 during an initial and subsequent semester, the student may be permanently dropped from the EST&P program and may not graduate. If this occurs, the student will have an opportunity to appeal to the Provost. Unless the decision is overturned, the student is not entitled to a refund of tuition or student fees.

C) Degree Planning and Tracking

It is the responsibility of each student to ensure that she or he are enrolled in courses to remain in good standing with the degree program and to complete all the necessary coursework for graduation according to the degree timelines. Each student is assigned an academic advisor, who is communicated to you via email and is listed in the HUB Student Information Online (SIO).

Stellic:

For the academic 2019-2020 year, the EST&P program will continue its trial use of a degree planning and tracking (auditing) interface called Stellic. Stellic is a student-driven, collaborative academic planning tool that employs the university's undergraduate catalog and degree requirements to assist students with schedule planning and in meeting their degree requirements. The EST&P and EST&P-AS degrees have been incorporated into the Stellic system and all students' degrees and concentrations can be planned and tracked within Stellic, including auditing the courses taken / planned with respect to degree requirements. If you have questions concerning your degree planning or audit, please discuss with your academic advisor. Note that this system is under development, and students should ensure degree audits are accurate with their academic advisor.

D) Graduation Requirements and Statute of Limitations

It is the responsibility of each student to ensure that she or he has completed all the necessary coursework for graduation. The EST&P Director and Associate Director are available to advise students during the semester, but only the student can be held responsible for failure to meet graduation requirements. Note that the EST&P curriculum and graduation requirements may be revised from time to time. However, the requirements in effect at the time of a student's matriculation will dictate the graduation requirements that he or she must follow.

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 the student enrolled in the program. This statutory period can be extended by the College of Engineering's Associate Dean for Graduate and Faculty Affairs for special circumstances that do not make it possible for the student to complete the requirements within the statutory period. Any request for a waiver of the statute of limitations for master's degree studies must be approved by the EST&P Director and by the College of Engineering's Associate Dean for Graduate and Faculty Affairs. The waiver request must explain the exceptional circumstances that warrant an extension. For cases in which a waiver is granted, the waiver will cover specific courses and will specify a time period for completion of the program.

For more details on the University's Statute of Limitations policy, visit here:

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

E) Leave of Absence, Withdrawals & Enrollment Verification

Students in the EST&P program are expected to attend all classes and participate in program activities. This excludes any defined academic break periods, and official University holidays. For the most up-to-date University calendar please see www.cmu.edu/hub/calendar.html.

Leave of absence:

A student may need to take a temporary leave of absence for many reasons. This is done by filing a Leave of Absence form with the HUB after securing the appropriate signature approvals. The leave will take effect on the date that the form is signed by the Dean of Engineering. Return from a voluntary leave of absence requires program approval through a Request for Return from Leave of Absence form. Students in good standing in all courses, and with no current or pending academic action when taking a Leave of Absence, will be reinstated with the same standing as prior to the leave. Students in poor standing, on academic probation, or with an academic integrity violation at the time of their Leave of Absence, must submit a written request for reinstatement. This request will be evaluated by the EST&P admissions committee, who will respond in writing to the request within two weeks. Requests for reinstatement must be submitted within the time limit imposed by the 6-year statute of limitations.

Withdrawal:

A student who decides to leave the university with no intentions of returning is required to file a Withdrawal form with the HUB. A student cannot return from a Withdrawal. For more information visit the University's [Student Leave](#) and [Student Return](#) policies.

Withdrawal of Degree:

The university reserves the right to withdraw a degree even though it has been granted should there be discovery that the work upon which it was based or the academic records in support of it had been falsified. In such a case, the degree will be withdrawn promptly upon discovery of the falsification. The complete reference to this university policy is available at:

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

Enrollment Verification:

Enrollment Services is the only University office that can provide an official letter of enrollment, an official transcript, or an enrollment verification. Enrollment verification can be requested online through [The HUB](#).

A student can request the EST&P program to provide a letter certifying their disciplinary concentration, as this information is not specified on either the diploma or transcript.

IV) Student Responsibilities, Resources

A) Degree and Program Requirement Knowledge

Students are responsible for successfully completing the program, being aware of the rules and policies, and swiftly resolving any issues. When questions arise, students should first consult this student handbook, the official CMU website, the EST&P Canvas pages, the HUB, SIO and Stellic, and other appropriate official references. If further clarification is needed, students should consult with EST&P staff, including the student's academic advisor. Students must always verify informal and unofficial sources of information, such as word of mouth from fellow classmates, through the official sources listed above, including verifying with their academic advisor.

Changing Academic Requirements and Policies:

The EST&P program changes requirements sometimes, to continually improve the program. EST&P uses a "grandfather" policy with regard to these changes; that is, every student has the right to graduate (a) under the policies in effect at the time of entry into the graduate program or (b) under the policy in force at the time of receiving the degree.

Student Handbook:

It is the responsibility of each student to read and understand the contents of this handbook. This handbook is not exhaustive and is subject to change, clarification, and revision at any time.

B) Academic Advisor

The role of the Academic Advisor is complex and can vary from student to student. At least three primary roles can be identified: evaluator, permissions grantor, and mentor. The Academic Advisor is responsible for evaluating the student's progress toward degree completion, for granting written approval for specific degree requirements / exceptions, and for providing guidance to assist individuals achieve successful degree and career outcomes. As such, students should meet with their advisors to obtain specific information on course options and degree progress, discuss or obtain written approval required for courses or degree exceptions, or to get career and professional advice. Advisors do his/her best to provide information and point students to relevant resources.

Keep in mind:

- The EST&P Advisor is a cooperative partner, along with other CMU resource partners, helping each student stay on track towards academic and professional career success.
Students are ultimately responsible for their own success.
- Conversations with your advisor do not count as "written approval". Written approval is defined as: a signed form, notes in the official student file, a letter, or an email.
When required, permission is granted only by written approval.
- An Advisor may provide broad context and specific positive and negative aspects related to a particular decision path: an Advisor does not "make a decision for students".
Decisions are made exclusively by the student.

Change of Advisor:

The Director and the Associate Director serve as academic advisors for all EST&P students. It is the responsibility of both the Advisor and Student to seek accommodations of differences in good faith. If a student wishes to change their academic advisor, this can be done via an email request to the Program Coordinator, who will make the update to the student's file.

C) Academic Calendar, Registration, Pre-Requisites, Degree Planning

EST&P and the [College of Engineering](#) adhere to the official CMU Academic Calendar. The Academic Calendar can be found at <https://www.cmu.edu/hub/calendar/index.html> and provides information on all deadlines including registration dates, class start dates, add/drop deadlines, exam dates and more. Note that BS/MS courses and PhD courses may have different specific calendars (especially add/drop deadlines). The [Heinz College](#) and the [Tepper School of Business](#) follow their own calendars, with dates that differ from the university's calendar for add, drop, audit, and pass/fail deadlines. EST&P students must adhere to these deadlines if they are taking courses from those colleges.

Registration for courses begins in April (November) for the Fall (Spring) semester. **CMU students are not permitted to register for two courses that conflict in time.** It is not uncommon to be waitlisted from some classes at the time of registration up until the tenth day of class. This is common practice across the university to ensure that students within their home department have priority to register for courses. Individual departments and instructors control and manage waitlists. As a courtesy to others, students should drop a course as soon as they decide not to take it. This may allow a waitlisted student to be enrolled and will limit the disruption to any team-based projects.

Courses at CMU generally have specified pre-requisites, which limit the ability of students without pre-requisites to register for such courses. As a graduate student, SIO may allow you to register for courses without having the published prerequisite. It is each student's responsibility to ensure they have adequate background knowledge to be successful in the courses they take.

Students are responsible to track their progress towards completion of EST&P degree requirements by monitoring course registration and degree progress in Student Information On-Line (SIO) and Stellic. If further clarification is needed, students should consult with their academic advisor.

D) Semester Timeframes and Attendance Requirements

All EST&P students must be physically present and attend classes from the beginning to the end of each semester. All EST&P students must attend final exams as scheduled by the university and individual course instructors. Neither the EST&P program nor course instructors have control over the university exam schedule. Students should keep this in mind when arranging travel at the end of a semester. Having purchased airline tickets is not an acceptable excuse for missing a final exam.

Proper registration for appropriate courses, attending courses and exams throughout the semester and finals, and maintaining an appropriate QPA (discussed elsewhere herein) are necessary conditions to stay in good standing with the program. Delays caused by failing or dropping a class, or academic probation due to poor grades, are not allowable reasons for extending a program of study.

E) Petitions for Exceptions and General Requests

General Petition Form:

If an EST&P student wants to petition an exception to a degree requirement rule or policy, the student must first set a meeting with their academic advisor to discuss which rule is being petitioned and their unique curricular circumstances. After this meeting, a petition form will be released for the student to submit for review by either the curriculum committee and/or appropriate department representative, as appropriate. The academic advisor will do this on the student's behalf. Students will be notified promptly concerning the decision on their petition.

Petition to Change Disciplinary Concentration:

EST&P students are admitted into a degree program with a disciplinary concentration as requested at the time of application. To petition for a change in disciplinary concentration, the following rules must be followed. EST&P students must complete their first semester under their admitted concentration before petitioning to change concentrations. EST&P students must first meet with their academic advisor to discuss the feasibility of a disciplinary concentration change, and then the student will be given the petition to change disciplinary concentration form with required attachment(s). After this meeting, the petition form will be released for the student to submit for review by either the curriculum committee and/or appropriate department representative(s), as appropriate. The academic advisor will do this on the student's behalf. The form must be submitted before the end of the first week of class in the semester the student will graduate. Also note that, if approved, this petition may result in changes to your transcript for cross-listed courses and cannot be reversed. Students will be notified promptly concerning the decision on their petition.

F) Miscellaneous Responsibilities

Change of Address:

Students are responsible for notifying EST&P and the HUB of all address changes in a timely manner. Students will be held responsible for any failure to receive official college notices due to having an incorrect address on file; F-1 students may jeopardize their status if address information is not kept current. Students can change their address using SIO, which is available via the HUB website: <http://www.cmu.edu/hub/index.html>.

Timing for Requests and Replies:

Please allow a minimum of 24 hours (one business day) to process a required form or to respond to an email request. EST&P Staff may occasionally accommodate a "last minute" request, but cannot guarantee availability or appropriate processing.

Suggestions for Success:

A few general guidelines / expectations for students to have a successful tenure within the EST&P program are that students:

- participate in the EST&P program, energy activities, and CMU community.
- take responsibility for their learning, decision-making, actions, and well-being.
- be respectful of fellow students, professors, and EST&P staff members and their time.

G) Professional Development and Other Resources and Opportunities

Carnegie Mellon University and the EST&P program offer a number of professional development opportunities and benefits, such as: on-campus career fairs, professional networking opportunities, workshops, career counseling, conference registration and travel funds, professional development support, service scholarships, and Graduate Student Assembly (GSA) representation. The following list identifies opportunities and application procedures.

The Carnegie Mellon Career and Professional Development Center (CPDC):

The Carnegie Mellon [Career and Professional Development Center](#) (CPDC) provides numerous career preparation and job search resources. These include guidance in preparation of resumes and cover letters, interviewing skills, offer negotiation and career networking, and career fair opportunities.

CPDC staff hold a weekly office hour in the EST&P study lounge and teach a 3-unit course entitled “Career & Professional Development for Engineering Master’s Students” (39-699).

CPDC sponsors an Energy Career Fair in association with Energy Week, sponsored by the Scott Institute of Energy Innovation. Information about the Energy Career Fair and Energy week will be communicated during the year.

Be sure to sign up for [Handshake](#) for full access to CPDC resources.

The CMU Graduate Education Office:

The CMU Graduate Education office provides numerous programs, workshops, and services of value to EST&P professional master’s students. Check their [Professional Development page](#) for up-to-date listing of events.

EST&P Professional Development Allocation:

EST&P students may apply to receive up to \$50 per semester in professional development expense reimbursement, during each semester of full-time enrollment in the EST&P program. Expenses MUST be pre-approved and allocated by the EST&P directors. Expenses must meet CMU guidelines for allowable non-employee expense reimbursement. Typical allowed expenses include: student-registration fee for an energy conference, professional certification exams, poster printing, and the like.

EST&P Conference Travel Supplemental Reimbursement:

There are opportunities throughout the academic year to attend energy related conferences, present posters or papers, and represent the EST&P program. If you wish to attend and participate in a professional meeting or conference, and to represent EST&P, you may request partial support for your travel by submitting a Conference Travel Application to EST&P requesting financial support. This form must be **submitted for review at least three weeks in advance of the travel date.**

Awards are contingent on availability of program funds, and priority is given for those making a paper or poster presentation, and for those making cost efficient travel plans. Your professional development allocation will be used as part of any awarded conference funding, and preference is given to supplement GSA conference funding awards. Only one supplemental request for travel support per student will be considered. Submission and approval of a Conference Travel Application is separate from but related to the travel reimbursement process.

You are responsible for reading and abiding by the University's Business and Travel Expense Policy. Receipts and justifications must be submitted within one week of purchase date or return from travel. Failure to follow University policy can lead to disciplinary action and/or non-payment of travel. For both professional development and travel reimbursement process, please contact the EST&P program coordinator for further detail and instructions.

EST&P Alumni & Director Scholarships:

A limited number of alumni and director scholarships are offered to incoming EST&P students having exceptional qualifications. Alumni and director scholarship offers are made by the admissions committee at the time that admission is offered; recipients currently receive ~17-50% reduction in their semester tuition. Alumni and director scholarship recipients must be full-time EST&P students. Scholarships may be extended for an additional semester if funding is available and if the student is in good academic standing (as judged by QPA and collaboration with faculty). Alumni and director scholarships are not offered at any time other than admission.

EST&P Intern Opportunities:

Several intern opportunities with the EST&P program are available throughout the year. Opportunities are announced during the academic year. These may include requests for a Course Assistant for an EST&P related class or for a Student Ambassador to support EST&P development and marketing, etc. When available, EST&P will advertise these opportunities to all eligible students and provide details on the application process.

EST&P Business Cards:

EST&P students have the option to request CMU business cards, during a select period of time that will be announced. The EST&P program sponsors the first 100 cards. Business cards can be requested online [here](#).

Graduate Student Assembly (GSA):

The GSA is a University-wide branch of student government that represents all graduate students at Carnegie Mellon. EST&P students elect their own representative to GSA, who serves as their contact regarding GSA issues and events.

GSA returns a portion of EST&P students' fees to the EST&P student group, if there is an EST&P representative. These funds can be used to support social and educational events, as decided by the EST&P students (and following CMU spending policies).

EST&P GSA representatives may be elected by students or appointed by the EST&P program office. Current representatives often assist to find their successor(s). Note that EST&P asks each GSA representative to sign a responsibilities agreement.

Responsibilities of the EST&P GSA representative include: attending GSA meetings, organizing at least one social event per semester (i.e., rock climbing, bowling, ice skating, etc.), sitting on the funding award committee, acting as a liaison between EST&P program staff and students, and helping with EST&P events.

Graduate Student Conference Funding:

[Graduate Student Conference Funding](#) is available through the Graduate Student Assembly and the Provost's Office, and is managed by the Office of the Assistant Vice Provost for Graduate Education. Award amounts are up to \$750 per student or up to \$1,500 per group. Preference is given to students making presentations. The open application periods and deadlines are listed on the [graduate education website](#). To obtain funding, students must read and follow all directions and ensure they meet all criteria for acceptance, including required post-conference activities of reporting and publicity participation.

H) Safeguarding Educational Equity**CMU Policy Against Sexual Harassment and Sexual Assault:**

Sexual harassment and sexual assault are prohibited by CMU, as is retaliation for having brought forward a concern or allegation in good faith. The policy can be viewed in its entirety at: www.cmu.edu/policies/documents/SA_SH.htm. If you have been impacted by any of these issues, you are encouraged to make contact with any of the following resources:

- Office of Title IX Initiatives, <http://www.cmu.edu/title-ix/>, 412-268-7125, tix@cmu.edu
- University Police, 412-268-2323
- University Health Services, 412-268-2157
- Counseling & Psychological Services, 412-268-2922

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

Maternity Accommodation Protocol:

Students whose anticipated delivery date is during the course of the semester may consider taking time away from their coursework and/or research responsibilities. All female students who give birth to a child while engaged in coursework or research are eligible to take either a short-term absence or formal leave of absence. Students in course work should consider either working with their course instructor to receive incomplete grades, or elect to drop to part-time status or to take a semester leave of absence. Students engaged in research must work with their faculty to develop plans for the research for the time they are away. Students are encouraged to consult with relevant university faculty and staff as soon as possible, as they begin making plans regarding time away. Students must contact the Office of the Dean of Student Affairs to register for Maternity Accommodations. Students will complete an information form and meet with a member of the Dean's Office staff to determine resources and procedures appropriate for the individual student. Planning for the student's discussion with her academic contact(s) (advisor, associate dean, etc.) will be reviewed during this meeting. For additional information, please visit the [Student Maternity Accommodation Protocol](#) webpage.

I) Problems, Graduate & University Ombudsperson, Grievance Resolution

Graduate students are expected to discuss any concerns or grievances with members of their academic program, including the Director, Associate Director, Academic Advisor, and/or Program Ombudsperson, as appropriate. If a student wishes, the Associate Dean for Graduate and Faculty Affairs of the College of Engineering is also available for consultation. All such discussions will be considered confidential provided no laws are broken and unless otherwise told by the graduate student.

EST&P Ombudsperson:

Within the EST&P program, students are encouraged to work with the Director and Associate Director when problems arise. However, situations may occur where students need advice on some aspect of their activities or interactions with others in the EST&P program, yet may not feel it is appropriate to speak with their advisor or another member of the EST&P staff or faculty. While close friends and family are important resources in such situations, it is also true that their scope of experience might not include working toward a Master's degree in Engineering at CMU. For this reason, EST&P relies on a Graduate Ombudsperson from our administrative home department.

The Materials Science and Engineering Ombudsperson is Neetha Khan and EST&P students may contact her at neetha@andrew.cmu.edu. She is available to consult with students about any situation that affects their work and, where appropriate, offer advice or attempt to resolve a problem. Conversations with the Ombudsperson are confidential (provided no laws are broken and unless otherwise told by the graduate student) and the Ombudsperson will not communicate information to the EST&P program office, Director, or Associate Director, Engineering Department Heads, or other faculty/staff members without the student's consent.

University Ombudsperson:

The Assistant Vice Provost for Graduate Education, Suzie Laurich-McIntyre, is the university Ombudsperson for graduate students. EST&P students may contact her at 412-268-7307 or suzannel@andrew.cmu.edu. The Ombudsperson's role is to provide support for graduate students under complete confidentiality (provided no laws are broken and unless otherwise told by the graduate student). The Ombudsperson will assist and support graduate students to help clarify issues and suggest possible solutions to problems, as well as direct students to the appropriate departmental and college processes and resources for handling conflicts.

Grievance Resolution:

If resolution of an academic grievance or concern cannot be obtained within their academic departments, graduate students may file a formal appeal of academic actions to the Associate Dean for Graduate and Faculty Affairs of the college. If a resolution cannot be reached by this process, an appeal may be made to the Provost at the request of either the student or the college.

A summary of the graduate student appeal and grievance procedures is available at the following link: www.cmu.edu/graduate/policies/appeal-grievance-procedures.html

V) EST&P Administrative Information

The EST&P administrative offices and study lounge are located on the 5th floor of Scott Hall. [Maps of campus](#) are available on the CMU website. **Directions:** From “the mall” between Baker Hall and Doherty Hall, walk past Wean Hall until you see the Sherman and Joyce Bowie Scott Hall on your right- this is an all glass building. Go through the main doors of Scott Hall and continue walking straight down the hallway in front of you. The EST&P offices are located on your right. The EST&P study lounge (5101) is the first room on the right, office 5103 (Nora/Justin) is in the middle, and 5105 (Prof. Salvador) is at the end of the hall. The 5th floor of Scott Hall is also home to the Scott Institute for Energy Innovation.

A) EST&P Affiliated Faculty and Staff Contact Information

| <u>Last, First Name</u> | <u>Office</u> | <u>Phone</u> | <u>email</u> |
|--|-------------------|--------------|--|
| Khan, Neetha - Ombudsperson | A309 Doherty Hall | 412-268-2332 | neetha@andrew.cmu.edu |
| Koval, Bryan - Student Life Coordinator | Morewood Grdn. | 412-268-2142 | bkoval@andrew.cmu.edu |
| Puglisi, Justin - Program Coordinator | 5103 Scott Hall | 412-268-2947 | jpuglisi@andrew.cmu.edu |
| Muller, Nicholas – EPP Professor (39-612) | 254C Posner Hall | 412-268-8121 | nzm@andrew.cmu.edu |
| Ohodnicki, Paul - MSE Professor (39-613) | N/A | 412-268-7200 | pohodnic@andrew.cmu.edu |
| Salvador, Paul - Director (39-610) | 5105 Scott Hall | 412-268-7672 | paulsalvador@cmu.edu |
| Samaras, Costa - CEE Professor (39-611) | 103 Porter Hall | 412-268-1658 | csamaras@cmu.edu |
| Siewiorek, Nora - Assoc. Director | 5103 Scott Hall | 412-268-6072 | norann@andrew.cmu.edu |
| Vietmeier, Crystal - Career Consultant | 252 West Wing | 412-268-2064 | cvietmeier@cmu.edu |

For the extended list of EST&P-associated faculty from the College of Engineering departments, please see the [EST&P About Us: Affiliated Faculty](#) page.

College of Engineering Department Locations and Department Head Contacts

| | | | |
|---|-------------------|--------------|--|
| College of Engineering | 110 Scaife Hall | | www.engineering.cmu.edu |
| Cagan, Jonathan | 412-268-5090 | | |
| Interim Dean of Engineering & George Tallman and Florence Barrett Ladd Professor in Engineering | | | |
| Chemical Engineering | 1107 Doherty Hall | 412-268-2230 | www.cmu.edu/cheme |
| Robinson, Anne | 1111 Doherty Hall | 412-268-2232 | |
| CHE Department Head & Professor of Chemical Engineering | | | |
| Civil & Environmental Engineering | 119 Porter Hall | 412-268-2940 | www.cmu.edu/cee |
| Dzombak, David | 119D Porter Hall | 412-268-2946 | |
| CEE Department Head & Hamerschlag University Professor of Civil & Environmental Engineering | | | |
| Electrical & Computer Engineering | Hamerschlag Hall | 412-268-7400 | www.ece.cmu.edu |
| Pileggi, Larry | 1106 Hamerschlag | 412-268-3299 | |
| ECE Department Head & Tanoto Professor of Electrical & Computer Engineering | | | |
| Engr. & Public Policy | 129 Baker | 412-268-2670 | www.cmu.edu/epp |
| Adams, Peter | 129 Baker Hall | 412-268-2838 | |
| EPP Interim Department Head & Professor of EPP and Civil and Environmental Engineering | | | |
| Materials Science & Engr. | 3325 Wean Hall | 412-268-2700 | www.cmu.edu/engineering/materials |
| Rohrer, Gregory | 3327 Wean Hall | 412-268-2696 | |
| MSE Department Head & W.W. Mullins Professor of Material Science & Engineering | | | |
| Mechanical Engineering | 4th Floor Scaife | 412-268-2500 | www.cmu.edu/me |
| Robinson, Allen | 401 Scaife Hall | 412-268-3657 | |
| MEG Department Head & Raymond J. Lane Distinguished Professor of Mechanical Engineering | | | |

C) EST&P Study Lounge Information

The Scott Hall 5101 door to the EST&P student study lounge can be accessed by swiping your CMU Student ID. This door must remain closed at all times: it should never be propped open. The kitchen area in the EST&P study lounge is available for student use, so long as everyone works together to maintain a clean and safe area. CMU custodial services will only empty trash and occasionally vacuum the floor. EST&P's professional staff do not provide custodial services. Each student is responsible to leave the lounge in reasonable order upon departing. Unrestricted access to the study lounge requires responsible adult behavior by each and every EST&P student. If the room is not kept in good condition and becomes a health and safety hazard, access to the study lounge will be restricted, such as: access only during business hours or only when EST&P staff are present. Examples of health and safety hazards include: cups, dirty dishes, or other items in the sink; unclean surfaces or furniture; food containers or other trash, or any personal items, left in the study lounge. Any items left in the lounge will be discarded. Students will be notified by email of any change to the access policies to the Study Lounge.

Mailboxes are not available for EST&P students, neither for academic nor personal use. If a student plans to have something shipped to themselves at EST&P, please notify the staff in advance and use the following address:

Your Name, c/o EST&P Program
Carnegie Mellon University
5000 Forbes Ave, Scott Hall 5103
Pittsburgh, PA 15213-3890

Printing:

As a CMU graduate student you have an assigned Andrew printing quota of \$40 per semester. Please see <https://www.cmu.edu/computing/services/endpoint/printing/quota.html> for printing information. A laser printer is currently available in the EST&P study lounge for limited black and white printing. This printer is a HP LaserJet Pro 400 model M401dne, and you can print by connecting your laptop to the printer's USB cable, or from the on-campus network using the printer's static IP address [172.22.51.11]. Low cost poster printing service is available through the Sorrells Engineering and Science Library in 4400 Wean Hall. Contact the library or see the reference instructions on the [Canvas](#) site- EST&P Professional Resources.

Computing:

Each student is assigned a single-sign-on account (Andrew account) that is used to access campus-wide and EST&P computing resources. Andrew accounts can be managed by visiting the Computing Services website at www.cmu.edu/computing/accounts. Students may contact the Computing Services Help Center if you have any IT issues (i.e., computers, phones, printers, etc.) at 412-268-4357 or it-help@cmu.edu.

VI) Academic Integrity

Carnegie Mellon maintains the highest ethical standards and makes continuous efforts to identify and create the kind of academic environment that its members wish to enjoy. As a CMU graduate student, you are an important participant in our University partnership that includes all faculty, staff, administrators, undergraduates, and graduate students. Thus, you are responsible for academic integrity, honesty, and fairness, as are all university community members.

The [CMU Office of Research Integrity and Compliance website](#) describes the university's position on ethical research, and this applies to research and project work that EST&P students conduct as part of their degree coursework.

“Carnegie Mellon University is responsible for the integrity of research conducted at the university. As a community of scholars, in which truth and integrity are fundamental, the university must establish procedures for the investigation of allegations of misconduct of research with due care to protect the rights of those accused, those making the allegations, and Carnegie Mellon University. Furthermore, federal regulations require the university to have explicit procedures for addressing incidents in which there are allegations of misconduct in research. Research misconduct is defined as fabrication, falsification, or plagiarism in proposing, performing, or reviewing research, or in reporting research results...”

Please review the University Policy on Academic Integrity

(<https://www.cmu.edu/policies/studentand-student-life/academic-integrity.html>). The policy includes the University expectations around academic integrity and provides definitions of cheating, plagiarism, and unauthorized assistance. A review of the University's Academic Disciplinary Actions procedures (<https://www.cmu.edu/student-affairs/theword/academic-discipline/index.html>) is also recommended. These procedures outline the process for investigating, reporting, and adjudicating violations of the University Policy on Academic Integrity. The procedures also outline the appeal process.

In support of the university's position, EST&P encourages EVERY incoming student take the CMU/CIT recommended training offered by the Collaborative Institutional Training Initiative (CITI). Furthermore, **ALL students in the EST&P-AS degree, and EST&P degree students taking Independent Study or Master's Project course work, are REQUIRED to complete the training by the end of their first semester— December 6, 2019—** and to submit their certificate of successful completion to the EST&P Program Coordinator.

The CIT Graduate Student Policy provides the following instructions. “For CIT graduate students, the CITI physical science module package is recommended, rather than the module package for engineers, although both are acceptable. The courses are available at CITI's website: www.citiprogram.org/. Select Carnegie Mellon University as your participating institution when you create your account. This topic is described fully in the CIT Graduate Student Policy page under [Responsible Conduct of Research \(RCR\)](#).”

REQUIRED Plagiarism Quiz:

The University of Indiana has an exceptional website that provides examples and a quiz to determine if you understand the difference between proper and improper attribution of text. **All EST&P students are required** to complete this quiz before the end of the first week of classes, and print and submit the certification provided when the quiz is passed. Certifications will be submitted via the EST&P Canvas site and collected by the EST&P Admissions and Program Coordinator. Submitting this certification indicates that you have learned and understand the

approved processes for text attribution. You will be held responsible for this information if a conflict arises in the academic year. Please complete the plagiarism quiz using the following link: www.indiana.edu/~istd/plagiarism_test.html

Academic Integrity violations:

Academic Integrity violations may arise when a student misinterprets course syllabus instructions prohibiting group collaboration on graded homework, or from blatant falsification of submitted work. Both situations result in disciplinary action, so please review carefully the policy on academic integrity at <https://www.cmu.edu/policies/student-and-student-life/academic-integrity.html>. While you should view the threat of disciplinary action as a serious one, it is equally important that you take up the ideal of Academic Integrity as foundational to your educational experience at CMU. We encourage you to embrace this part of the intellectual thread that binds you with the University community. Accordingly, the complete CMU Statement on Academic Integrity is quoted here.

Policy on Academic Integrity - DATE OF ISSUANCE: This policy was approved by President's Council on April 11, 2013 and replaces the University's Policy on Cheating and Plagiarism, which was originally issued to campus on June 16, 1980 as Organization Announcement #297, and then revised in 1990.

“ABSTRACT:

Academic credit awarded to an individual should represent the work of that individual. Therefore, students at Carnegie Mellon are expected to produce their own original academic work. Collaboration or assistance on academic work to be graded is not permitted unless explicitly authorized by the course instructor(s). The citation of all sources is required. When collaboration or assistance is permitted by the course instructor(s), the acknowledgement of any collaboration or source of assistance is likewise required. Failure to do so is dishonest and is the basis for a charge of cheating, plagiarism, or unauthorized assistance. Such charges are subject to disciplinary action.

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. Honesty and good faith, clarity in the communication of core values, professional conduct of work, mutual trust and respect, and fairness and exemplary behavior represent the expectations for ethical behavior for all members of the Carnegie Mellon community.

A) University Policy Statement

In any manner of presentation, it is the responsibility of each student to produce her/his own original academic work. Collaboration or assistance on academic work to be graded is not permitted unless explicitly authorized by the course instructor(s). Students may utilize the assistance provided by Academic Development, the Global Communication Center, and the Academic Resource Center (CMU-Q) unless specifically prohibited by the course instructor(s). Any other sources of collaboration or assistance must be specifically authorized by the course instructor(s).

In all academic work to be graded, the citation of all sources is required. When collaboration or assistance is permitted by the course instructor(s) or when a student utilizes the services provided by Academic Development, the Global Communication Center, and the Academic Resource Center (CMU-Q), the acknowledgement of any collaboration or assistance is likewise required.

This citation and acknowledgement must be incorporated into the work submitted and not separately or at a later point in time. Failure to do so is dishonest and is subject to disciplinary action.

Instructors have a duty to communicate their expectations including those specific to collaboration, assistance, citation and acknowledgement within each course. Students likewise have a duty to ensure that they understand and abide by the standards that apply in any course or academic activity. In the absence of such understanding, it is the student's responsibility to seek additional information and clarification.

B) University Policy Violations

Cheating occurs when a student avails her/himself of an unfair or disallowed advantage that includes but is not limited to:

1. Theft of or unauthorized access to an exam, answer key, or other graded work from previous course offerings.
2. Use of an alternate, stand-in, or proxy during an examination.
3. Copying from the examination or work of another person or source.
4. Submission or use of falsified data.
5. Using false statements to obtain additional time or other accommodation.
6. Falsification of academic credentials.

Plagiarism is defined as the use of work or concepts contributed by other individuals without proper attribution or citation. Unique ideas or materials taken from another source for either written or oral use must be fully acknowledged in academic work to be graded. Examples of sources expected to be referenced include but are not limited to:

1. Text, either written or spoken, quoted directly or paraphrased.
2. Graphic elements.
3. Passages of music, existing either as sound or as notation.
4. Mathematical proofs.
5. Scientific data.
6. Concepts or material derived from the work, published or unpublished, of another person.

Unauthorized assistance refers to the use of sources of support that have not been specifically authorized in this policy statement or by the course instructor(s) in the completion of academic work to be graded. Such sources of support may include but are not limited to advice or help provided by another individual, published or unpublished written sources, and electronic sources. Examples of unauthorized assistance include but are not limited to:

1. Collaboration on any assignment beyond the standards authorized by this policy statement and the course instructor(s).
2. Submission of work completed or edited in whole or in part by another person.
3. Supplying or communicating unauthorized information or materials, including graded work and answer keys from previous course offerings, in any way to another student.
4. Use of unauthorized information or materials, including graded work and answer keys from previous course offerings.
5. Use of unauthorized devices.
6. Submission for credit of previously completed graded work in a second course without first obtaining permission from the instructor(s) of the second course. In the case of concurrent courses, permission to submit the same work for credit in two courses must be obtained from the instructors of both courses.”

C) Penalties for Academic Integrity & Community Standards Violations

Violations will be handled on a case by case basis. In addition to the course-level action imposed by the instructor, students with academic integrity & community standards violations will be subject to the same sanctions as with academic probation:

- Students cannot receive an alumni or director scholarship or program support;
- Students cannot be selected to receive awards, travel/conference funding, etc.;
- Students may not formally represent EST&P as an officer or other positions in a student club or campus organization;

In addition, sanctions for academic integrity & community standards violations will include:

- Any awards provided by EST&P will be rescinded immediately, including retroactive rescinding of awards received in previous semesters.

In accordance with university policy, a student who violates the academic integrity and community standards policy will not be permitted to drop the course in which the offense occurred to avoid the penalty. If the student attempts to drop the course, he/she will be re-enrolled. If the student retakes the course or an equivalent course to fulfill the program requirement or prerequisite, he/she will be charged additional tuition. Students who want to appeal an academic integrity action must state in writing to the Provost their intention to do so, within one week of the penalty date in questions, and then must submit their written appeal to the Provost no later than two weeks after said penalty date. Appeals must be in writing, with appropriate documentation.

In extreme cases where the first violation is particularly deplorable, as determined by the EST&P Director and Associate Director, a student may be permanently dropped from the EST&P program. Upon a second academic integrity violation, the student will immediately be dropped from the EST&P program.

University-wide Academic Disciplinary Protocol:

Procedures for dealing with allegations of these policy violations are detailed in the university's Academic Disciplinary Action Procedures for Graduate Students: <https://www.cmu.edu/student-affairs/ocsi/academic-integrity/documents/academic-disciplinary-actions-overview-for-graduate-students.2013.pdf> which is published as part of The WORD student handbook.

Periodic review of these procedures will be overseen by the Dean of Student Affairs, or her/his designee, in consultation with Faculty Senate and the relevant student governing bodies. Any amendments to these procedures are subject to the approval of Faculty Senate. Additional guidelines and procedures for graduate students may exist at the college/department/program level, in which case they are communicated in the college/department/program graduate student handbook.

VII) Miscellaneous Items and University Policies

A) Acknowledgements

This handbook was prepared with the help and support of our partner engineering departments: Chemical Engineering, Civil & Environmental Engineering, Electrical & Computer Engineering, Engineering & Public Policy, Materials Science & Engineering, and Mechanical Engineering. Portions of the text herein are copied with permission from some of their graduate student handbooks. Every attempt is made for EST&P program policies to conform with [The Word](#) and [College of Engineering graduate policies](#). These include policies on intellectual property, freedom of expression, student privacy, academic disciplinary actions, and academic integrity.

B) Consumer Information

Students in the EST&P program are self- or family-funded, funded by their employer, or by external scholarships, fellowships, and educational loans. Students are permitted to enroll in project-based classes, as well as independent study and master's project research courses, but only EST&P-Applied Studies and EST&P-Applied Studies and Integrated Study in Computer Science degree students are required to do so. The [CMU HUB website consumer information page](#) provides access to information that current and prospective students of the University may need in order to be informed consumers. The CMU website also provides student consumer information linked on their [Middle States Accreditation](#) pages.

C) Carnegie Mellon University Statement of Assurance

Carnegie Mellon University does not discriminate in admission, employment, or administration of its programs or activities on the basis of race, color, national origin, sex, handicap or disability, age, sexual orientation, gender identity, religion, creed, ancestry, belief, veteran status, or genetic information. Furthermore, Carnegie Mellon University does not discriminate and is required not to discriminate in violation of federal, state, or local laws or executive orders. Inquiries concerning the application of and compliance with this statement should be directed to the vice president for campus affairs, Carnegie Mellon University, 5000 Forbes Avenue, Pittsburgh, PA 15213, telephone 412-268-2056. Persons may obtain general information about Carnegie Mellon University by calling 412-268-2000. This Statement of Assurance can also be found at: www.cmu.edu/policies/administrative-and-governance/statement-of-assurance.html.

D) Assistance for Individuals with Disabilities

The Office of Disability Resources at Carnegie Mellon University (<http://www.cmu.edu/education-office/disability-resources/>) has a continued mission to provide physical and programmatic campus access to all events and information within the Carnegie Mellon community. They work to ensure that qualified individuals receive reasonable accommodations as guaranteed by the Americans with Disabilities Act (ADA) and Sections 503 and 504 of the Rehabilitation Act of 1973. Students who would like to receive accommodations can begin the process through [Disability Resources secure online portal](#) or email access@andrew.cmu.edu to begin the interactive accommodation process.

For more information, please see <http://www.cmu.edu/education-office/disability-resources/>. Students with disabilities are encouraged to self-identify with the Office of Disability Resources and request needed accommodations. Any questions about the process can be directed to Catherine Getchell, 412-268-6121, getchell@cmu.edu.

E) University Policies & Expectations

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

- The Word/Student Handbook: www.cmu.edu/student-affairs/theword
- Academic Integrity Website: <https://www.cmu.edu/policies/student-and-student-life/academic-integrity.html>
- University Policies Website: www.cmu.edu/policies
- College of Engineering Graduate Student Policy website: <https://engineering.cmu.edu/education/academic-policies/graduate-policies/index.html>
- Graduate Education Website: www.cmu.edu/graduate/policies
- Computing Services Website: www.cmu.edu/computing/guideline
- Carnegie Mellon's policy on alcohol and drugs.
All students should be aware of university policies: <https://www.cmu.edu/policies/administrative-and-governance/alcohol-and-drug-policy.html>

International Students must register and attend the mandatory Office of International Education (OIE) international student orientation. If you are unable to attend orientation, you may make an appointment to meet with an advisor in the Office of International Education in Posner Hall 3rd floor. You must check in with OIE **by the 10th day of classes** or face administrative withdrawal.

F) The Carnegie Mellon Code

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

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

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

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

The commitment of its faculty, staff, and students to these standards contributes to the high respect in which the Carnegie Mellon degree is held. Students must not destroy that respect by their failure to meet these standards. Students who cannot meet them should voluntarily withdraw from the university.

The Carnegie Mellon Code can also be found on-line at:
<https://www.cmu.edu/student-affairs/theword/>.

G) University Health Requirements

As a full-time student, you must have medical insurance and required immunizations that meet the university's minimum requirements. Please see 2019-2020 student health insurance criteria at www.cmu.edu/health-services/student-insurance.

All full-time students must meet the university's immunization requirements posted at www.cmu.edu/health-services/immunization. Students must complete an online immunization form and/or waiver **by July 1, 2019** documenting that you have either had the required vaccines or have had blood tests proving immunity to certain diseases. Students can complete the immunization form in HealthConnect, accessible at www.cmu.edu/health-services. Failure to submit the online immunization form or meet the requirements before the start of classes will result in disenrollment from classes and removal from university housing.

Students must also confirm enrollment in the required health insurance plan, or certify compliance with mandatory health insurance coverage at Student Health Services: **by September 9, 2019.**

VIII) APPENDICES

A) Highlighted University Resources for Graduate Students

i) Key Offices for Graduate Student Support

Graduate Education Office

www.cmu.edu/graduate; grad-ed@cmu.edu

The Graduate Education Office provides central support for all Master's and Doctoral students with a focus on their academic experience at Carnegie Mellon. Our goals are to support, advise and guide individual graduate students as they work to complete their degrees and to provide resources which will enhance their professional development experience.

Resources offered through the Graduate Education Office include- but are not limited to:

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

The Graduate Education Office is directed by Suzie Laurich-McIntyre, Ph.D., Assistant Vice Provost for Graduate Education, who offers personalized consultations with graduate students to support their academic success, connects them with relevant resources, and clarifies university level policies.

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

Office of the Dean of Students

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

The Office of the Dean of Students provides central leadership of the metacurricular experience at Carnegie Mellon including the coordination of student support. Vice President of Student Affairs and Dean of Students Gina Casalegno leads the division of student affairs which includes the following offices and departments (not an exhaustive list):

- Athletics, Physical Education and Recreation
- Career and Professional Development Center (CPDC)
- Center for Student Diversity and Inclusion
- Cohon University Center
- Counseling & Psychological Services (CaPS)

- Dining Services
- Office of Community Standards and Integrity (OCSI)
- Office of Student Leadership, Involvement, and Civic Engagement (SLICE)
- University Health Services (UHS)
- Wellness Initiatives

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

The Office of Community Standards and Integrity provides consultation, support, resources and follow-up on questions and issues related to Academic Integrity: <https://www.cmu.edu/student-affairs/ocsi/students/index.html>

College Liaisons are senior members of the Division of Student Affairs who work with departments and colleges addressing student concerns across a wide range of issues. College Liaisons are identified on the student SIO page in the Important Contacts list.

Center for Student Diversity & Inclusion

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

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

The Center offers resources to enhance an inclusive and transformative student experience in dimensions such as access, success, campus climate and intergroup dialogue. Additionally, the Center supports and connects historically underrepresented students and those who are first in their family to attend college in a setting where students' differences and talents are appreciated and reinforced, both at the graduate and undergraduate level. Initiatives coordinated by the Center include, but are not limited to:

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

Assistance for Individuals with Disabilities

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

The Office of Disability Resources at Carnegie Mellon University has a continued mission to provide physical and programmatic campus access to all events and information within the Carnegie Mellon community. We work to ensure that qualified individuals receive reasonable accommodations as guaranteed by the Americans with Disabilities Act (ADA) and Sections 503 and 504 of the Rehabilitation Act of 1973. Students who would like to receive accommodations can begin the process through [Disability Resources secure online portal](#) or email access@andrew.cmu.edu to begin the interactive accommodation process.

Students with disabilities are encouraged to self-identify with the Office of Disability Resources and request needed accommodations. Any questions about the process can be directed to Catherine Getchell, 412-268-6121, getchell@cmu.edu.

Eberly Center for Teaching Excellence & Educational Innovation

www.cmu.edu/teaching

We offer a wide variety of confidential, consultation services and professional development programs to support graduate students as teaching assistants or instructors of record during their time at Carnegie Mellon University and as future faculty members at other institutions.

Regardless of one's current or future teaching context and duties, our goal is to disseminate evidence-based teaching strategies in ways that are accessible and actionable. Programs and services include campus-wide Graduate Student Instructor Orientation events and our Future Faculty Program, both of which are designed to help participants be effective and efficient in their teaching roles. The Eberly Center also assists departments in creating and conducting customized programs to meet the specific needs of their graduate student instructors. Specific information about Eberly Center support for graduate students is found at www.cmu.edu/teaching/graduatestudentsupport/index.html.

Graduate Student Assembly

www.cmu.edu/stugov/gsa/index.html

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

GSA offers an expanding suite of social programming on and off-campus to bring graduate students from different departments together and build a sense of community. GSA is the host of the Graduate Student Lounge on the 3rd floor of the Cohon University Center- a great place to study or meet up with friends. GSA also maintains a website of graduate student resources on and off-campus. Through GSA's continued funding for professional development and research conferences, the GSA/Provost Conference Funding Program and GSA/Provost GuSH Research Grants are able to run, as managed by the Graduate Education Office. As we move forward,

GSA will continue to rely on your feedback to improve the graduate student experience at CMU. Feel free to contact us at <gsa@cmu.edu> to get involved, stop by our office in the Cohon University Center Room 304 or become a representative for your department.

Intercultural Communication Center (ICC)

www.cmu.edu/icc/

The Intercultural Communication Center (ICC) is a support service for nonnative English speakers, both newly arrived international students as well as students who attended high school and/or undergraduate programs in the US. The ICC offers seminars, workshops, and 1-1 consultations that develop the language and cross-cultural skills needed to succeed in academic programs at Carnegie Mellon University. The ICC provides International Teaching Assistant (ITA) testing, a required test indicating a nonnative speaking TA has the language proficiency required to work with students in classes, labs or individual meetings. The ICC also supports International Teaching Assistants in developing fluency and cultural understanding to teach successfully at Carnegie Mellon University.

Office of International Education (OIE)

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

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

Veterans and Military Community

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

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

Carnegie Mellon Ethics Hotline

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

The health, safety and well-being of the university community are top priorities at Carnegie Mellon University. CMU provides a hotline that all members of the university community should use to confidentially report suspected unethical activity relating to areas below:

- Academic and Student Life
- Bias Reporting
- Environmental Health and Safety

- Financial Matters
- High-Risk Incident
- Human Resource Related
- Information Systems
- Research
- Threat of Business Interruption
- Threat of Violence or Physical Harm
- Title IX

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

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

Policy Against Retaliation

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

Additional details regarding the Policy Against Retaliation are available at <https://www.cmu.edu/policies/administrative-and-governance/whistleblower.html>

ii) Key Offices for Academic & Research Support

Academic Coaching/Consulting - The Office of Academic Development

<https://www.cmu.edu/acadev/coaching/index-grad.html>

The Academic Coaching Program is a student assistance program that supports graduate students in the development and/or improvement of skills, strategies, and processes that are necessary for a productive and successful experience at CMU and beyond. Support for graduate students comes in two forms: Individualized Sessions and Group Workshops. Individualized Sessions are the primary focus and can be best understood as working with a personal consultant. Academic Coaches/Consultants meet with students regularly, in a one-on-one capacity, in order to assess a student's needs and implement strategies to satisfy those needs, while providing a variety of support throughout the process. Areas of focus include, but are not limited to:

- Self-Management
 - Developing and/or adjusting your organizational system
 - Managing time and combating stress and procrastination
 - Prioritization and decision making
 - Advancing mindset, self-efficacy, and belongingness
 - Balancing coursework, research, and professional development opportunities
- Study Skills
 - Identifying and modifying your learning process
 - Metacognition
 - Test-taking and note-taking strategies
 - Content comprehension and retention

Computing and Information Resources

www.cmu.edu/computing

Computing Services maintains and supports computing resources for the campus community, including the campus wired and wireless networks, printing, computer labs, file storage, email and software catalog. As members of this community, we are all responsible for the security of these shared resources. Be sure to review the Safe Computing (<https://www.cmu.edu/computing/safe/>) section and the University Computing Policy (<https://www.cmu.edu/policies/information-technology/computing.html>)

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

Global Communication Center

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

The Global Communication Center offers free one-on-one tutoring and workshops for native and non-native English speakers from any academic discipline. Our tutors are trained to provide research-backed communication strategies on written, oral, and visual communication projects, in the sciences and the humanities. We can help you improve the effectiveness of your communication in any academic project, including the following:

- Technical reports
- Dissertations
- Research posters

- Oral presentations
- Journal articles
- Grant proposals
- Class essays

You can visit us at any stage in the project—whether you are just getting started and need to talk through ideas or are putting the finishing touches on a final draft.

We also offer workshops on topics including crafting professional emails, team communication, PowerPoint slide design, data visualization, and job application materials.

For more information, to view our resources, or to schedule an appointment, visit our website.

Research at CMU

www.cmu.edu/research/index.shtml

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

Office of Research Integrity & Compliance

www.cmu.edu/research-compliance/index.html

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

iii) 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 uncertain about why they are feeling upset and perhaps confused about how to deal with those feelings. 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 also provides workshops and group sessions specifically for graduate students on campus. CaPS services are provided at no cost. Appointments can be made in person or by telephone, 412-268-2922.

Health Services

www.cmu.edu/HealthServices/

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

UHS also has a registered dietician and health promotion specialists on staff to assist students in addressing nutrition, drug and alcohol and other healthy lifestyle issues. In addition to providing direct health care, UHS administers the Student Health Insurance Program. The Student Health Insurance plan offers a high level of coverage in a wide network of health care providers and hospitals. Appointments can be made by visiting UHS's website, walk-in, or by telephone, 412-268-2157.

Campus Wellness

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

At the university, we believe our individual and collective well-being is rooted in healthy connections to each other and to campus resources. The university provides a wide variety of wellness, mindfulness and connectedness initiatives and resources designed to help students thrive inside and outside the classroom. The BeWell@CMU e-newsletter seeks to be a comprehensive resource for CMU regarding all wellness-inspired events, announcements and professional and personal development opportunities. Sign up for the Be Well monthly newsletter via bit.ly/BeWellatCMU or by contacting the Program Director for Student Affairs Wellness Initiatives, at alusk@andrew.cmu.edu.

Religious and Spiritual Life Initiatives (RSLI)

www.cmu.edu/student-affairs/spirituality

Carnegie Mellon is committed to the holistic growth of our students, including creating opportunities for spiritual and religious practice and exploration. We have relationships with local houses of worship from various traditions and many of these groups are members of

CMU's Council of Religious Advisors. We also offer programs and initiatives that cross traditional religious boundaries in order to increase knowledge of and appreciation for the full diversity of the worldview traditions. Our RSLI staff are here to support students across the spectrum of religious and spiritual practice and would be more than happy to help you make a connection into a community of faith during your time at CMU.

University Police

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

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

The University Police Department is located at 300 South Craig Street (entrance is on Filmore Street). The department's services include police patrols and call response, criminal investigations, fixed officer and foot officer patrols, event security, and crime prevention and education programming as well as bicycle registration. Visit the department's website for additional information about the staff, emergency phone locations, crime prevention, lost and found, finger print services, and annual statistic reports.

Carnegie Mellon University publishes an annual campus security and fire safety report describing the university's security, alcohol and drug, sexual assault, and fire safety policies and containing statistics about the number and type of crimes committed on the campus and the number and cause of fires in campus residence facilities during the preceding three years. Graduate students can obtain a copy by contacting the University Police Department at 412-268-6232. The annual security and fire safety report is also available online at <https://www.cmu.edu/police/annualreports/>.

Shuttle and Escort Services

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

iv) The WORD

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

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

Carnegie Mellon Vision, Mission

Statement of Assurance

Carnegie Code

Academic Standards, Policies and Procedures

Educational Goals

Academic and Individual Freedom

Statement on Academic Integrity Standards for Academic & Creative Life

Assistance for Individuals with Disabilities

Master's Student Statute of Limitations

Conduct of Classes

Copyright Policy

Cross-college & University Registration

Doctoral Student Status Policy

Evaluation & Certification of English Fluency for Instructors

Final Exams for Graduate Courses

Grading Policies

Intellectual Property Policy

Privacy Rights of Students

Student's Rights

Research

Human Subjects in Research

Office of Research Integrity & Compliance

Office of Sponsored Programs

Policy for Handling Alleged Misconduct of Research

Policy on Restricted Research

Tax Status of Graduate Student Awards

Campus Resources & Opportunities

Alumni Relations

Assistance for Individuals with Disabilities

Athletics, Physical Fitness & Recreation

Carnegie Mellon ID Cards and Services

Cohon University Center

Copying, Printing & Mailing

Division of Student Affairs

Domestic Partner Registration
Emergency Student Loan Program
Gender Programs & Resources
Health Services
Dining Services
The HUB Student Services Center
ID Card Services
Leonard Gelfand Center
LGBTQ Resources
Multicultural and Diversity Initiatives
Opportunities for Involvement
Parking and Transportation Services
Shuttle and Escort Services
Spiritual Development
University Police
Student Activities
University Stores

Community Standards, Policies and Procedures

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

Carnegie Mellon's Guide to an Ethical Job Search

GUIDELINES & POLICIES

The mission of the Carnegie Mellon Career & Professional Development Center (CPDC) is to maximize the career and life potential of our students. One of the ways we accomplish this is by creating opportunities for our students that connect them to employers with whom we have developed relationships. It is important for the development of each student that they conduct themselves in an ethical manner. Not honoring agreements with recruiters reflects poorly on the university and impacts the organization's actions regarding future recruiting activities at Carnegie Mellon.

It is for these reasons that we hope that you represent CMU in a positive manner when conducting your job search. In order to make use of our services, we at the CPDC expect all of our students/job seekers to adhere to the following ethical standards. All students are expected to read and familiarize themselves with these guidelines, in addition to the [consequences for violating these guidelines](#). For any additional questions regarding our policy, please contact your Career Consultant

Students are expected to:

1. Attend all scheduled campus interviews:

Missing or canceling less than 24 hours prior to an interview or 12 hours before an appointment uses/blocks a time slot that could have been filled by another student.

Interview Cancellation and No-Show Policy: If you need to cancel an on-campus interview, you can do so in Handshake before the cancellation end date listed for that interview, as found in the job description. Students who fail to cancel their interview before the interview cancellation date found in Handshake will be subject to the offense policy.

If an emergency occurs and you must cancel after Handshake's cancellation end date, please do so by calling Gerry Marnell in the Career Center at 412-268-1646. Students who do not show up for interviews will be subject to the offense policy. In addition, the student will be required to send a letter of apology to the recruiter. The letter must be approved by the student's career consultant.

2. Be on time for campus interviews:

Please arrive in the Career Center, 10-15 minutes before your interview. Being late reflects poorly on a candidate and disrupts the appointment times of other candidates on the schedule.

3. Present qualifications in a truthful manner:

This expectation applies to information on Handshake, application materials and responses in interviews including, but not limited to, listing accurate GPA (not rounding up), major, degree level and experiences information on a resume and online profiles, as well as being truthful in all interview responses.

4. Honor all agreements made with recruiters regarding site visits:

Accepting an on-site interview with a company sets into motion a series of events: travel arrangements, scheduling, hotel reservations and a host of other details. If that student subsequently fails to follow through with the site visit without giving the company enough advance notice, it costs the company a considerable amount of wasted time and money, as well as denies another student the opportunity to interview.

5. Understand employers' hiring and offer policy

The CPDC works with employers to provide students with sufficient time to consider offers of employment. For more information, view the [Employer Hiring & Offer Policy](#).

6. Accept job/internships in an ethical manner:

When a student accepts a full-time or internship position, that student is expected to stop all recruiting activities, including applying and interviewing for employment opportunity. Students are expected to notify all other employers with whom they have scheduled or pending interviews of their need to be removed from consideration for those opportunities.

Reneging:

Accepting an employment offer after you previously accepted an offer with another employer is defined as 'reneging' and is considered dishonest and unethical and carries serious implications. Reneging reflects poorly on the candidate and potentially damages Carnegie Mellon's reputation and relationships with employers. Instances of reneging that are reported by an employer will be investigated by the CPDC and may result in loss of recruiting privileges for the student.

Offense Policy:

- **First Offense:** Removal of job search and interviewing access on Handshake for six months.
- **Second Offense:** Removal of job search and interviewing access on Handshake for one year.
- **Third Offense:** Removal of job search and interviewing access on Handshake for five years.

Note: Depending on the severity of the offense, the CPDC reserves the right to refer the student's case to the Office of the Dean of Student Affairs for further review and judicial proceedings.

Appeal Process:

Any student wishing to appeal his or her revocation of Handshake privileges is entitled to utilize our formal appeal process. To request an appeal contact your career consultant at the CPDC.

B) Approved Disciplinary Concentration Courses

Disciplinary concentration in Chemical Engineering (CHE):

The CHE disciplinary concentration is defined as 36 units of approved CHE graduate-level courses (other than independent study or graduate project courses).

Disciplinary Required Course:

06-665 Process Systems Modeling Spring 12 units

Disciplinary Electives:

Any combination of course from this list 24 units

| <i>M.S. level courses recommended as CHE disciplinary concentration</i> | | |
|---|---|--------------|
| 06-623 | Mathematical Modeling of Chemical Engineering Processes | FA: 12 units |
| 06-625 | Chemical and Reactive Systems | FA: 12 units |
| 06-663 | Analysis and Modeling of Transport Phenomena | SP: 12 units |
| <i>PhD courses permitted as CHE disciplinary concentration</i> | | |
| 06-702 | Advanced Reaction Kinetics | SP: 12 units |
| 06-703 | Advanced Fluid Dynamics | FA: 12 units |
| 06-704 | Advanced Heat and Mass Transfer | SP: 12 units |
| 06-705 | Advanced Chemical Engineering Thermodynamics | FA: 12 units |
| 06-713 | Mathematical Techniques in Chemical Engineering | FA: 12 units |
| 06-720 | Advanced Process Systems Engineering | SP: 12 units |

Disciplinary concentration in Civil and Environmental Engineering (CEE):

The CEE disciplinary concentration is defined as 36 units of approved CEE graduate-level courses (other than independent study or graduate project courses).

Approved courses are available in sustainability, water quality, air quality, advanced infrastructure systems, mechanics, and other areas.

Disciplinary Electives:

Any combination of course from this list

36 units

| | | |
|--------------|---|------------------|
| 12-704 | Probability and Estimation Methods for Engineering Systems | FA: 12 units |
| 12-706 | Civil Systems Investment Planning and Pricing | FA: 12 units |
| 12-712 | Introduction to Sustainable Engineering | FA: 12 units |
| 12-714 | Environmental Life Cycle Assessment | SP: 12 units |
| 12-740 | Data Acquisition, Sensing, and Instrumentation | FA-A1: 6 units |
| 12-741 | Data Management and Analysis | FA-A2: 6 units |
| 12-745 | AIS Systems Project Course | SP: 12 units |
| 12-747 | Sustainable Buildings | FA-A1: 6 units |
| 12-749 | S. T.: Climate Change Adaptation | SP: 6 units |
| 12-750 | Infrastructure Systems | SP: 12 units |
| 12-751 / 651 | Air Quality Engineering | SP: 12 / 9 units |
| 12-752 | S.T. Data-Driven Building Energy Management | FA-A2: 6 units |
| 12-761 | S.T. Sensing and Data Mining for Smart Structures and Systems | SP: 12 units |
| 12-766 | S.T. Climate Change, Science and Adaption | SP: 12 units |

Disciplinary concentration in Electrical and Computer Engineering (ECE):

The ECE disciplinary concentration is defined as 36 units of approved ECE graduate-level courses (other than independent study or graduate project courses).

Disciplinary Electives:

Any combination of course from this list 36 units

| | | |
|---------|--|--------------|
| 18-418 | Electric Energy Processing: Fundamentals and Applications (counts as undergrad course) | SP: 12 units |
| 18-618 | Smart Grids & Future Electric Energy Systems | FA: 12 units |
| 18-631 | Introduction to Information Security | FA: 12 units |
| 18-649 | Distributed Embedded Systems (occasional) | FA: 12 units |
| 18-730 | Introduction to Computer Security | FA: 12 units |
| 18-731 | Network Security | SP: 12 units |
| 18-743 | Energy Aware Computing | FA: 12 units |
| 18-771 | Linear Systems | FA: 12 units |
| 18-777 | Complex Large-Scale Dynamic Systems (occasional) | 12 units |
| 18-875 | Economics and Engineering of Electric Energy Systems | SP: 12 units |
| 18-879M | S.T. in Systems & Controls: Optimization in Energy Networks | SP: 12 units |
| 18-879S | S.T. in Systems & Controls: Networked Control Systems (occasional) | 12 units |
| 18-882 | S.T. in Energy Systems: Power Electronics | FA: 12 units |

Disciplinary concentration in Engineering and Public Policy (EPP):

The EPP disciplinary concentration is defined as 36 units of approved EPP graduate-level courses (other than independent study or graduate project courses).

Disciplinary Electives:

Any combination of course from this list

36 units

| | | |
|---------------------------------------|---|--------------|
| 19-424 (cross-listed/c.l. MEG 24-424) | Energy and the Environment (<i>undergrad course; grad. enrollment limited; counts as 9 of the allowed 12 undergrad units</i>) | FA: 9 units |
| 19-472 (c.l. ECE 18-372) | Fundamentals of Electric Power Systems (<i>undergrad course; counts as allowed 12 undergrad units towards EST&P degree</i>) | 12 units |
| 19-617 (CEE 12-750) | Infrastructure Management | |
| 19-624 | S.T. Emerging Energy Policies | FA: 12 units |
| 19-625 | Sustainable Energy for the Developing World | SP: 12 units |
| 19-626 (occasional) | Climate Science and Policy | 12 units |
| 19-638 | Smart Grids & Future Electric Energy Systems | FA: 12 units |
| 19-653 (MEG 24-640) | S.T. Climate Change Mitigation | SP: 12 units |
| 19-655A | S.T. Climate Change, Impacts and Adaptation | FA: 12 units |
| 19-655C | S.T. Design, Innovation and Strategy | FA: 12 units |
| 19-656 | S.T. CO2 Capture and Sequestration | SP: 6 units |
| 19-683 | S.T. Science, Technology & Innovation Policy | FA: 6 units |
| 19-688 (occasional) | Innovation for Energy and the Environment | 12 units |
| 19-696 | S.T. Sustainable Development & Innovation | FA: 9 units |
| 19-714 (CEE 12-714) | Environmental Life Cycle Assessment | SP: 12 units |
| 19-717 (CEE 12-712) | Introduction to Sustainable Engineering | FA: 12 units |
| 19-724 (MSE 27-724) | Materials for Energy Storage | 6 units |

| | | |
|------------------------|---|--------------|
| 19-736 (MSE 27-726) | Energy and Materials in Policy Making | 6 units |
| 19-739 (ECE18-875) | Engineering & Economics of Electric Energy Systems | SP: 12 units |
| 19-740 (MEG 24-740) | Combustion & Air Pollution Ctrl | SP: 12 units |
| 19-751 (CEE 12-751) | Air Quality Engineering | SP: 12 units |
| 19-881 / 19-882 | 1. Electric Market Restructuring 2.Low Carbon Electric Pwr | FA/SP: 6 |

Disciplinary concentration in Materials Science and Engineering (MSE):

The MSE disciplinary concentration is defined as 36 units of approved MSE graduate-level courses (other than independent study or graduate project courses).

Disciplinary Required Courses:

| | | | |
|--------|-------------------|----------|---------|
| 27-798 | Thermodynamics I | Fall-A1 | 6 units |
| 27-799 | Thermodynamics II | Fall-A2: | 6 units |

Disciplinary Electives:

Any combination of course from this list 24 units

| | | |
|--------|--|----------------|
| 27-705 | Nanostructured Materials | SP: 12 units |
| 27-718 | Soft Materials | FA: 12 units |
| 27-721 | Processing Design | FA: 12 units |
| 27-724 | Materials for Energy Storage | SP-A4: 6 units |
| 27-725 | Materials in Nuclear Systems | 6 units |
| 27-727 | Mechanical Behavior in Extreme Environments | SP: 6 units |
| 27-728 | Materials for Future Energy Systems | 6 units |
| 27-729 | Solid State Devices for Energy Conversion | FA: 6 units |
| 27-730 | Energy Consumption and Minimization in Metals Production | FA: 6 units |
| 27-750 | Advanced Characterization and Microstructural Analysis | SP: 12 units |
| 27-752 | Foundations of Semiconductor Nanostructures | 12 units |
| 27-765 | Special Topics: Materials and Society | |
| 27-766 | Diffusion in Materials | FA: 6 units |
| 27-770 | Electronic, Magnetic, and Optical Properties | SP: 12 units |
| 27-771 | Special Topics: Materials and Devices for Energy Efficiency Applications | SP: 12 units |
| 27-788 | Defects in Materials | FA: 6 units |
| 27-794 | Chemical Stability of Materials in Extreme Environments | 6 units |
| 27-796 | Structure of Materials | FA: 6 units |
| 27-797 | Bonding of Materials | FA: 6 units |

Disciplinary concentration in Mechanical Engineering (MEG or MechE)

The MEG disciplinary concentration is defined as 36 units of approved MEG graduate-level courses (other than independent study or graduate project courses).

Disciplinary Required Course:

24-722 Energy System Modeling Fall 12 units

Disciplinary Electives:

Any combination of course from this list 24 units

| | | |
|--------|--|--------------|
| 24-616 | Tribology - Friction, Lubrication & Wear | 12 units |
| 24-618 | Computational Transport Phenomena | SP: 12 units |
| 24-628 | Special Topics: Energy Trans & Conv. at Nano Scale | SP: 12 units |
| 24-629 | Special Topics: Direct Solar & Thermal Energy Conversion | FA: 12 units |
| 24-640 | Special Topics: Climate Change Mitigation | SP: 12 units |
| 24-644 | Special Topics: Advanced Power Plant Design | SP: 12 units |
| 24-711 | Fluid Mechanics | 12 units |
| 24-718 | Computational Fluid Dynamics | SP: 12 units |
| 24-721 | Advanced Thermodynamics | FA: 12 units |
| 24-730 | Advanced Heat Transfer | FA: 12 units |
| 24-731 | Conductive Heat Transfer | 6 units |
| 24-732 | Convective Heat Transfer | 6 units |
| 24-733 | Radiative Heat Transfer | 6 units |
| 24-736 | Two-Phase Flow & Heat Transfer | |
| 24-642 | Fuel Cell Systems | FA: 12 units |
| 24-740 | Combustion and Air Pollution Ctrl | SP: 12 units |

C) EST&P, EST&P-AS or EST&P-CS Degree Audit

Note that this audit can now be done in Stellic, using CMU login credentials:
<https://academicaudit.andrew.cmu.edu/>

Academic Year 2019-2020

NAME: _____ **Andrew ID:** _____

Degree (EST&P, EST&P-AS, or EST&P-CS): _____

Disciplinary Concentration _____

CORE COURSES: EST&P, EST&P-AS and EST&P-CS— 24 units of required Energy Core

| Semester | Year | Grade | Course # | Units | Title |
|----------|------|-------|----------|-------|-----------------------------|
| FALL | | | 39-610 | 6 | Energy Conversion & Supply |
| FALL | | | 39-613 | 6 | Energy Transport & Storage |
| SPRING | | | 39-611 | 6 | Energy Demand & Utilization |
| SPRING | | | 39-612 | 6 | Energy Policy & Economics |

TOTAL = 24 units

DISCIPLINARY CONCENTRATION: EST&P, EST&P-AS and EST&P-CS— 36 units required:

Must be from approved concentration course list given in Appendices (and in Stellic)

| Semester | Year | Grade | Course # | Units | Title |
|----------|------|-------|----------|-------|-------|
| | | | | | |
| | | | | | |
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| | | | | | |
| | | | | | |

TOTAL ≥ 36 units

BREADTH ELECTIVES: EST&P, EST&P-AS and EST&P-CS— 36 units required:

College of Engineering graduate courses and/or pre-approved CMU graduate courses (see exceptions in Handbook / Stellic)

| Semester | Year | Grade | Course # | Units | Title |
|----------|------|-------|----------|-------|-------|
| | | | | | |
| | | | | | |
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| | | | | | |
| | | | | | |
| | | | | | |

TOTAL ≥ 36 units

PROJECT COURSES: EST&P-AS and EST&P-CS Degrees ONLY— 24 units required:

| Semester | Year | Grade | Course # | Units | Title |
|----------|------|-------|----------|-------|-------|
| | | | | | |
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TOTAL ≥ 24 units

COMPUTER SCIENCE CORE: EST&P-CS Degree only— **24** units required:

| Semester | Year | Grade | Course # | Units | Title |
|----------------|--------------------------|-------|----------|-------|--|
| Fall or Spring | First or second semester | | 15-513 | 12 | Introduction to Computer Systems |
| Fall or Spring | First or second semester | | 17-514 | 12 | Principles of Software Construction: Objects, Design and Concurrency |

TOTAL = 24 units

COMPUTER SCIENCE CONCENTRATION: EST&P-CS Degree only— **36** units required:

Computer Science graduate courses and/or pre-approved by your advisor (see exceptions in Handbook / Stellic)

| Semester | Year | Grade | Course # | Units | Title |
|----------|------|-------|----------|-------|-------|
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TOTAL ≥ 36 units

D) EST&P Handbook Acknowledgement Form



**Energy Science
Technology & Policy**
Carnegie Mellon University
College of Engineering

The Energy Science, Technology and Policy (EST&P) program Graduate Student Handbook has been prepared to inform you about program policies, philosophies and practices. Please read the entire handbook carefully, giving special attention to the section on academic integrity.

To maintain your status as a master's student seeking an EST&P degree, you must complete your review of this handbook during the first week of classes and then sign a copy of this acknowledgement (using the online jotform given below).

By signing, you affirm that you have read a copy of the 2019-2020 EST&P Graduate Student Handbook, that you understand the information contained therein, and that you agree to comply with the policies and procedures contained in the handbook. The handbook should be followed as your general guide to the goals, policies, practices, and expectations of the Energy Science, Technology and Policy Master's Program. Note that this handbook is not intended to cover every situation that may arise during your course of study and is that the handbook is not a contract between you and the EST&P program.

Sign Handbook Acknowledgement form, here: <https://form.jotform.com/81696111706154>

E) **Fall 2019 Checklist for EST&P Students**

Submit these items by the due date.

Should you have any issues, please contact Justin Puglisi, Admissions and Program Coordinator,
at jpuglisi@andrew.cmu.edu

| Item: | Due Date: |
|--|--|
| EST&P Student Handbook Acknowledgement Form – Review/Sign/Submit | 9/6/19 (Jotform) |
| Media Consent Form – Review/Sign/Submit | Orientation or 9/6/19 (Jotform) |
| Plagiarism Quiz – Complete/Submit More info: Plagiarism Quiz 2019.pdf | 9/6/19 (submit certification to Justin via e-mail) |
| CMU Business Cards- Request online | 9/6/19 (Google Form) |
| Resume for the EST&P Fall Resume Book – Complete/Submit | 9/13/19 (Handshake) |
| Professional Photo Day (one time only) | Time & Location - TBA |
| CITI's Responsible Conduct of Research (EST&P-AS students or those taking master's project/ independent study course)- Complete/Submit More info: RCR Training 2019.pdf | Before registering for project/independent study courses OR by 12/6/19 (submit certification to Justin via email) |
| Sexual Assault Prevention for Graduate Students | 9/6/19 (submit screenshot of “Course Progress” to Justin via e-mail) |