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INTRODUCTION

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. Obtain general information about Carnegie Mellon University by calling 412-268-2000. The Statement of Assurance can also be found on-line at: http://www.cmu.edu/policies/documents/SoA.html.

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: http://www.cmu.edu/student-affairs/theword/code.html

Departmental Contacts

<table>
<thead>
<tr>
<th>Department Head</th>
<th>Yu-li Wang</th>
<th>x8-4442</th>
<th>All issues</th>
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<td>Conrad Zapanta</td>
<td>x8-9061</td>
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<td>GAC Chair</td>
<td>Newell Washburn</td>
<td>X8-2130</td>
<td>Graduate academic requirements &amp; policies</td>
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<tr>
<td>Business Manager</td>
<td>Vanessa Calvin</td>
<td>x8-2580</td>
<td>Administrative supervision, human resources &amp; financial support</td>
</tr>
<tr>
<td>Graduate Program Administrator</td>
<td>Crystal Hall</td>
<td>x8-4707</td>
<td>Graduate admissions, record management, registration, and general assistance</td>
</tr>
<tr>
<td>GBMES</td>
<td>Rebecca Duffy</td>
<td></td>
<td>Graduate student life and peer support</td>
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</table>

University Contacts

**Graduate Student Services**  |  |  | Support for graduate students under complete confidentiality, to help clarify issues and suggest possible solutions to problems as |

Suzie Laurich-McIntyre   | x8-7970 |
Counseling and Psychological Services x8-2922 Counseling of personal or academic concerns in a safe, confidential setting, including but not limited to: problems with family, friends, or school, concerns about the future, feelings of stress, low self-esteem, anxiety, depression, or loneliness.

Office of the Dean of Student Affairs Renee Camerlengo x8-2142 Initiatives related to academic integrity, multicultural programming, and graduate student support.

The Hub x8-8186 Fee and tuition payment, ID cards, financial aid, transcripts and verifications, graduation and diplomas

Abbreviations and Definitions

BME Biomedical Engineering
CIT College of Engineering – also known as Carnegie Institute of Technology
GAC Graduate Affairs Committee
DH Doherty Hall
GBMES The Graduate Biomedical Engineering Society
ICC Intercultural Communication Center
MCS Mellon College of Science
OIE Office of International Education
PTC Off-Campus Site at Pittsburgh Technology Center
SCS School of Computer Science
Semester Fall, Spring, Summer
TA Teaching Assistant
The Hub Enrollment Services

Useful Links*

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<td>Graduate Student Application</td>
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<tr>
<td>College of Engineering</td>
<td><a href="http://engineering.cmu.edu/current_students/graduates/index.html">http://engineering.cmu.edu/current_students/graduates/index.html</a></td>
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</table>
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Ph.D. Student Policies: http://engineering.cmu.edu/current_students/graduates/phd_policies.html
Transfer Credit Request Form: http://engineering.cmu.edu/files/documents/graduate_students/grad_transfer_credit_request.pdf

Carnegie Mellon University

Academic Calendar: http://www.cmu.edu/hub/calendar.html
Campus Map: http://www.cmu.edu/about/visit/campus-map.shtml
Campus Services: http://www.cmu.edu/campus-services/
Computer Store: http://www.cmu.edu/stores/computer/
Computing Services: http://www.cmu.edu/computing/
Dining Services: http://www.cmu.edu/dining
Enrollment Services: http://www.cmu.edu/hub/
Environmental Health and Safety: http://www.cmu.edu/ehs
Health Insurance: http://www.cmu.edu/health-services/student-insurance/
Health Services: http://www.studentaffairs.cmu.edu/HealthServices/
ID Cards: http://www.cmu.edu/idplus/idcards/index.html
Intercultural Communication Center: http://www.cmu.edu/icc/
ITA Test: http://www.cmu.edu/icc/testing/ITA/
University Main Public Portal: http://www.cmu.edu
Internal Portal for Students: http://www.cmu.edu/computing/students/
Office of International Education: http://www.studentaffairs.cmu.edu/oie/
Parking & Transportation Services: http://www.cmu.edu/parking/
Academic Integrity Policy: http://www.cmu.edu/policies/documents/Academic%20Integrity.html
Research Ethics & Responsible Conduct of Research: http://www.cmu.edu/research-compliance/responsible-conduct/training.html
Schedule of Classes: https://enr-apps.as.cmu.edu/open/SOC/SOCServlet
Shuttle & Escort Services: http://www.cmu.edu/police/shuttleandescort/
Tartans (Athletics): http://www.cmu.edu/athletics/
Tartanswiki: http://wiki.contrib.andrew.cmu.edu/wiki/Welcome
University Libraries: http://www.library.cmu.edu/Libraries/
University Police: http://www.cmu.edu/policy/

* To access pages protected by Shibboleth authentication, please Copy Hyperlink and paste the URL into a web browser.
1 ACADEMIC POLICIES

The BME Department offers the following graduate degrees: Doctor of Philosophy (Ph.D.), Research-Option Master of Science (M.S.), Practicum-Option Master of Science (M.S.), joint M.D./Ph.D. with the University of Pittsburgh School of Medicine, and a dual Master of Science degree in Biomedical Engineering and Engineering and Technology Innovation Management (M.S. in BME/ETIM).

Ph.D. students, under the guidance of their academic advisor, are expected to make original scholarly contributions in their area of research and demonstrate the ability to perform at the highest scholarly level by international standards. Examples include having one or more articles past the acceptance stage of publication in a peer-reviewed journal and one or more presentations at a conference by the time of their dissertation defense.

Research-Option M.S. students are expected to demonstrate a strong potential for original research, by submitting a substantial final research report.

Practicum-Option and BME/ETIM dual M.S. students build up the depth and breadth of their knowledge in biomedical engineering through problem-solving, and in many instances, clinical exposure.

The BME Department occasionally changes its program requirements in order to meet the evolving needs of the field. The Department applies a “grandfather” policy for each change, where students may complete their respective programs under the requirements in effect either at the time of their matriculation or at the time of their graduation. This policy does not apply to rule changes at the College or University level.

1.1 Registration

Full-time students must register for at least 36 units per semester. Ph.D. students receiving financial support administered through the BME Department must register for a minimum of 48 combined course and research units each semester.

International students who need to maintain legal visa status must register for a full-time 36 unit or more course load, unless otherwise arranged by the Office of International Education (OIE).

Students interested in auditing a course may register for the corresponding number of units for no grade or academic credit. Course audits require the approval of the course instructor (approval from advisor may also be necessary). MS students will be responsible for tuition of audited courses. The course audit form is accessible online at http://www.cmu.edu/hub/registration/docs/course-audit.pdf

1.1.1 Leave of Absence and Withdrawal

Under extenuating circumstances (financial, academic, or personal), students may need to interrupt their studies. Students have the options of requesting either a leave of absence (a temporary departure from the university with the intention of returning) or withdrawal (leaving the university with no intention of returning). To consider these options students are urged to first consult the University Leave of Absence and Withdrawal policy and understand the procedures as posted on the HUB web site.

When considering a leave of absence or withdrawal, students should contact the Graduate Program Administrator and their Academic Advisor to discuss arrangements, alternatives, and conditions that may be necessary for a smooth return to their studies in Biomedical Engineering and at Carnegie Mellon University.

1.1.2 Statute of Limitations

As outlined in the Doctoral Student Status Policy, Ph.D. students must complete all the degree requirements no later than ten years from their original matriculation date into the Doctoral program. Candidacy for the Ph.D. degree occurs after successful completion of the Ph.D. Qualifying Examination and lasts for a period of six calendar years. If, at the end of this six year period, the student fails to complete the requirements for the degree, he/she must reapply for admission to the Ph.D. program and will be judged competitively against other students applying during the same cycle. Petitions
for extension of the six-year limit may be made to the College of Engineering under extenuating circumstances; such as forced change of advisor, military service, or prolonged illness. The full policy can be found at the College of Engineering Ph.D. Policy Site. A separate, stricter Statute of Limitations governs BME administered financial support (3.1.2).

M.S. students must complete all requirements, as outlined in the College of Engineering Policy on Statute of Limitations for Masters Degree Studies policy, no later than six years from their original matriculation date in the Master’s program. Once this time-to-degree limit has lapsed, the student will need to reapply and gain acceptance to the program to resume work towards his/her M.S. degree. Under extraordinary circumstances, such as leave of absence, military or public service, family or parental leave, or temporary disability, the College of Engineering may extend the statute of limitations for a period commensurate with the duration of that interruption. This extension requires a written petition, approval from the Department Head for Biomedical Engineering and approval from the Dean (or designate) of the College of Engineering.

1.1.3 ABD (All But Dissertation in Residence, for Ph.D. students only)

ABD (All But Dissertation) status applies to Ph.D. students who have completed all formal degree requirements (Section 2.1) except for the completion and approval of the Ph.D. Dissertation. An ABD student maintains student status and privileges, and is expected to remain actively engaged with the University. The ABD policy is governed by the College of Engineering and the University.

To enter the ABD status, the student must complete a Doctoral Student Status Agreement form available through the Graduate Program Administrator or on the HUB web site, typically upon passing the Ph.D. Proposal Examination.

In most cases, ABD students work full-time on their research, and the ABD status affects neither the tuition nor the access to university resources including computing services. Students must continue to register for 42-990, Ph.D. Thesis Research each semester, including the semester of graduation, and will continue to be assessed at the full-time tuition rate. Under exceptional circumstances and through formal petition to the College of Engineering, the tuition for a full-time ABD student may be reduced to that corresponding to 5 units per semester provided that:

- The student has demonstrated financial hardship, e.g. after expiration of the Statute of Limitations for Financial Support (Section 3.1.2).
- The student does not receive any financial support (such as tuition, stipend, fees or health insurance) tied to activities that are integral to his/her doctoral program that is paid by or administered by the University. In addition, the student cannot receive financial compensation from the University such as research assistantship or paid teaching assistantship, except for hourly wages.
- The student has accumulated at least three years of full-time student status.
- The student is in good standing and is making progress towards the Ph.D. degree.
- The student has no more than two semesters of required work; ABD with full-time status and 5 units of tuition will not be allowed for more than two semesters, where summer is considered a semester.

This tuition reduction precludes the student from receiving financial compensation from the University such as research assistantship or paid teaching assistantship, except for hourly wages.

In the final semester, if all the degree requirements are completed, full-time Ph.D. candidates on ABD status may pay a prorated tuition or no tuition if all the graduations requirements are completed by the end of the first full month of the semester (see Section 2.4.5). In either case, there is no waiver of campus fees. See the College of Engineering ABD Policy for additional tuition adjustment information.

1.1.4 ABS (All But Dissertation in Absentia, for Ph.D. students only)

ABS status applies to a Ph.D. student who has left the university with the intent of completing his/her Ph.D. Dissertation but is not actively engaged with the university and does not require university resources as outlined below. A student may request to be in ABS so long as the following three conditions apply:
The student has been enrolled as a full-time graduate student at Carnegie Mellon University for at least one academic year. Part-time graduate enrollment may, at the Department's discretion, be counted pro-rata toward this requirement.

The student does not receive any financial support (such as tuition, stipend, fees or health insurance) tied to activities that are integral to his/her doctoral program that is paid by or administered by the University. In addition, the student cannot receive financial compensation from the University such as research assistantship or paid teaching assistantship, except for hourly wages.

The student does not require substantial use of university resources. Departmental certification of this condition shall be subject to guidelines established by the College. ABS students may continue to use the University library, to enter the buildings for consultation and to obtain University health insurance, but may use computing services only for departmental communications and Ph.D. Dissertation preparation. In cases when an ABS student needs to perform only a few studies to complete the thesis, the student should consult the Department Head to determine the appropriate way to proceed.

The student does not pay any tuition until the final semester for thesis submission, defense, and graduation, when the student is required to pay tuition on her/his own for 5 units. ABS cannot be used for maintaining a full-time student status, and therefore cannot be applied to foreign students who stay on the U.S. on student visa.

1.2 Advisor
Before or soon after entering the program, each Practicum-Option M.S. student will be assigned one or more official academic advisors (referred to in singular throughout the Handbook). Unless otherwise arranged, Ph.D. and Research-Option M.S. students must take the initiative to find an advisor within the first month at Carnegie Mellon University. The Advisor provides guidance for both course planning and research projects. The BME Department is committed to fostering optimal advisor/student interactions by establishing standards and timetables for equitable treatment of students.

1.2.1 Role of the Advisor
The role of the advisor is complex and can vary from student to student, but at least three characteristics can be identified: mentor, evaluator, and colleague.

For Practicum-Option students the advisor is responsible for assisting with course selection, for monitoring and evaluating the student’s progress, and for working closely with the student toward a successful academic and professional outcome.

For Ph.D. and Research-Option MS students, the advisor is responsible for helping the student define a project and build the necessary foundation, for monitoring and evaluating the student’s progress, and for working closely with the student toward successful research and professional outcome.

1.2.2 Searching for Advisors
Advisor search can be pivotal for the success of Ph.D. or Research-Option M.S. education. Given the close working relationship between the student and advisor, the search must take into consideration not only matching research interest but also learning/mentoring styles. A productive relationship can last well after graduation and turn into long-term collaboration and mutual-support. Therefore, the student must take a proactive, thoughtful approach when considering advisor options.

In some cases, students and faculty may identify each other unambiguously as the ideal partner for graduate education during the admission stage. The BME Department, upon receiving notification from both the student and faculty, may make an early match before or soon after the student reaches a decision to accept an admission offer. However, for reasons explained above, such direct match is discouraged unless the student and advisor feel certain that they have gained sufficient understanding to ensure mutual benefit from an early decision.
Otherwise, students should use the first few weeks of the first semester to search for an advisor. Students may interact with multiple potential advisors in whatever way productive for decision making, which may include office visits of the faculty and group members, shadowing for experiments, and attending group meetings. The Department does not dictate the number or schedule of such interactions, and a student may probe multiple groups concurrently. Since the final decision will be made by the Department, not necessarily following the top choice of the student or faculty, students and advisors should avoid discussing or reaching a decision at the matching stage.

Ph.D. students are generally informed of several potential advisors before the matching process. They should submit their preferences from these choices, with remarks as appropriate, to the Graduate Program Administrator confidentially between the end of the second and third week of September (for Fall-entry students). Unless there is a compelling reason, the list should include more than one potential advisor. The Department will then contact the potential advisors for their preferences without revealing the information submitted by the student. Final decision takes into consideration not only the preferences of the student and faculty, but also project needs and optimal use of the advising and supporting resources of the entire Department.

Research-option M.S. students should submit their preference list to the Graduate Program Administrator between early and mid-October (for Fall-entry students). The list should ideally include several faculty members, in case the top choice(s) are unable to accept the student. The Department will not make a decision before early October, thus there is no advantage in rushing the process.

1.2.3 Switching Advisors
Under unusual circumstances, a student may wish to change the advisor; such cases should be discussed as soon as possible with the Department Head or the GAC Chair. For Ph.D. students, finding a new advisor often involves identifying a faculty member with not only matching interest but also available funding for providing financial support. While the Department will make every effort to help, the student bears the responsibility of identifying an acceptable advisor and the Department cannot guarantee continuation of funding past the semester following the current semester counting summer. If a new advisor is found, the student must discuss specific commitments with the current advisor during the transition period, as mediated and monitored by the Department Head. Reasonable tasks may include finishing up experiments, writing up the work, archiving the data, training a new student, etc. The student is expected to show a high level of professionalism and responsibility. If a new advisor cannot be identified by the end of the following semester, then the student must leave the Department and forfeit enrollment in the Ph.D. program. For Direct-Entry Ph.D. students, every effort should be made to complete an M.S degree under such circumstances. Students who cannot find a new advisor are not eligible to stay in the Department as self-supported students.

For Research-Option M.S. students, switching advisors will likely affect progress toward the degree and/or any financial support arranged by the previous advisor; the student must take these factors into consideration. When a new advisor is found, the student is expected to discuss the transition with the current advisor and bring any commitments to a responsible closure. In the event that a Research-Option M.S. student is not able to find a new advisor he/she will be required to switch to the Practicum-Option M.S. program.

An advisor may request that a Ph.D. or Research-Option M.S. student who is not a good fit in the research group switch advisors. For Ph.D. students, the original advisor has the responsibility of continuing any existing financial support for, at most, one semester following the current semester, unless the student is showing an exceptionally poor performance. The Ph.D. student will have to leave the Department at the end of the following semester if he/she fails to find a new advisor. For Direct-Entry Ph.D. students, every effort should be made to complete an M.S degree under such circumstances. Ph.D. students who cannot find a new advisor are not eligible to stay in the Department as self-supported students.
1.3 Switching between M.S. and Ph.D. Programs

1.3.1 Switching from M.S. to Ph.D.
M.S. students who wish to continue with Ph.D. training in BME at Carnegie Mellon University must apply for admission to the Ph.D. program according to the regular admissions policy, using the online application system. The student does not have to pay the application fee or retake any standardized tests unless requested by the Department. The student must request three letters of recommendation with at least two coming from faculty members of Carnegie Mellon University. Acceptance into the program will depend on both qualifications of the student and the availability of financial support. If admitted, financial support for the student will typically begin the first day of the following semester, unless otherwise arranged. The Department Head will make an appropriate assignment of an advisor. Eligible courses taken for the M.S. in BME at Carnegie Mellon University may be counted toward both the M.S. and Ph.D. degree. Even though the student is admitted into the Advanced-Entry Ph.D. program, course requirements will be assessed by applying eligible courses toward the course requirements of Direct-Entry Ph.D. program as described in Section 2.1.4.

1.3.2 Switching from Ph.D. to M.S.
Students initially accepted into the Direct-Entry Ph.D. program are free to switch to the M.S. program at any time within the first year. Direct-entry Ph.D. students who fail the Ph.D. Qualifying or Proposal Examination may switch to the M.S. program, as addressed in Sections 2.2.6 and 2.3.6. Students receiving BME-administered financial support will have the stipend stopped immediately upon switching of the program and tuition support stopped the following semester.

1.4 Performance Review
The GAC reviews the progress of Research-Option M.S. students after the first semester, to ensure that their coursework and research are on track. Feedback may be provided by email. If a student is not meeting the expectations of the advisor/Department he/she will be switched to the Practicum-Option M.S. program at the start of the second semester.

The Department rigorously tracks the progress of Ph.D. students and provides timely and constructive feedback. A secure Ph.D. Performance Review web site (accessible from **Graduate Student Portal**) facilitates this process.

A faculty meeting for Ph.D. Performance Review is held at the beginning of each semester. Materials presented at the Ph.D. Performance Review consist of all academic and advising records to date, a self-assessment written by the student, and a feedback letter drafted by the advisor. The discussion then leads to a letter designation (SP, USP, N-1, M2M; see below) as well as a finalized feedback letter to the student.

At the beginning of each semester (excluding summer) and before the Ph.D. Performance Review, students are required to update the information on the Performance Review web site, including self-assessment, CV, and worksheet of degree requirements. The student is expected to make a thoughtful self-assessment of his/her academic, research, and professional progress. To generate the most constructive feedback from the faculty, the student should include an assessment of his/her general strengths and weaknesses and comment on possible areas of improvement. A laundry list of things accomplished or to be accomplished is not acceptable.

The outcome of Ph.D. Performance Review directly impacts departmental financial support. The assessment of the overall progress is designated as one of the following:

- **SP (satisfactory progress)** indicates that the faculty body is satisfied with the student’s performance. The feedback letter may give specific pointers to help the student’s research.

- **USP (unsatisfactory progress)** indicates that the faculty body is concerned over some areas of the student’s performance. The feedback letter will include specific concerns and expectations. In most cases, it is not difficult to convert the designation of USP to SP in the following semester given appropriate attention to the feedback.

- **N-1 (support not to be continued past the end of the following semester)** indicates that the faculty body is seriously concerned over the student’s performance. The feedback letter will include specific milestones that the student must
reach in order to receive a designation of SP in the following semester. Otherwise, the student’s financial support is terminated at the end of the following semester and the student will be asked to leave the Department.

M2M (support not to be continued past the end of the month) indicates that the faculty body is gravely concerned over the student’s performance or conduct. The feedback letter will include specific milestones that the student must reach in order for the financial support to continue. The progress of the student is monitored closely, and the decision whether to extend the support each month is made by the advisor in consultation with the GAC and the Department Head. In the event that support is terminated the student will be asked to leave the Department.

Should the student wish to formally respond to the feedback letter, he/she may do so in email form to the GAC Chair within two weeks of receiving the feedback. The letter will be distributed to the BME faculty and a response by the Department Head will be sent to the student within two weeks.

### 1.5 Academic Integrity

The BME Department takes academic integrity extremely seriously, and will take strong actions consistent with the College of Engineering and Carnegie Mellon University policy against any student who engages in cheating or plagiarism in courses or research. For details on what constitutes plagiarism, see the [Carnegie Mellon University Policy on Academic Integrity](https://www.cmich.edu/policies/academic-integrity/) and the [College of Engineering Policy on Graduate Student Academic Integrity Violations](https://www.bme.cmu.edu/policies.php). Online resources with examples of plagiarism can be particularly helpful.

All students are required to complete the How to Recognize Plagiarism module. Students must complete the module within the first semester of study and, upon satisfactory completion; the certificate must be submitted to the Graduate Program Administrator. This document will remain in the student file throughout their time at Carnegie Mellon University.

#### 1.5.1 Penalties for Violating Academic Integrity

In cases of suspected violations of academic integrity, the instructor informs the BME Department and may refer the case directly to the Dean of Student Affairs. The student is barred from receiving any financial aid upon the first confirmed violation and may be placed on academic probation. In extreme cases where a first violation is particularly deplorable, a student may be expelled from the University. Upon second violation, the student will be expelled from the University.

#### 1.5.2 Appeal Process for Violations of Academic Integrity

A student may appeal a penalty against an academic integrity violation, including expulsion, if he/she deems the penalty inappropriate and/or believes that improper procedure has been followed. Within one week of the notification of penalty, the student may submit a written appeal to the Department Head, the Dean of College of Engineering, or the University Provost.

When an appeal is made to the Provost, the Provost will determine the appropriate actions, which may include denying the appeal, remanding the case to the Department Head for further consideration, ordering a new or different penalty, convening a Review Committee for additional investigation of facts and/or determination of sanctions. For details, see the [Carnegie Mellon Academic Disciplinary Actions Policy](https://www.cmich.edu/policies/academic-disciplinary-actions/).

### 1.6 Resolution of Grievances

The policy on the resolution of grievances is set by the College of Engineering (see the [College of Engineering Graduate Student Policy](https://www.bme.cmu.edu/policies.php) site). While the BME Department encourages graduate students to bring up any grievances with the advisor first, there are many alternative or complementary options. Students may seek informal advice from peers, from the Graduate Program Administrator, any faculty member of the BME Department, the Chair of GAC, the Department Head, or the College of Engineering Associate Dean for Academic Affairs. All such discussions with the faculty and staff will be treated as confidential at the request of the student.
Academic grievance or concern may be brought up formally to the Department Head or GAC Chair. If resolution of an academic grievance or concern cannot be reached within the BME Department, students may contact the College of Engineering Associate Dean for Academic Affairs and consider filing an appeal of academic actions with the College. In accordance with the Carnegie Mellon University policy, such appeals will ordinarily be heard and decided by the College of Engineering College Council. Written materials and findings of such appeal processes are considered confidential. If this process cannot reach a resolution, an appeal may be made to the Provost at the request of either the student or the College.

2 ACADEMIC REQUIREMENTS

Students must opt for letter grades for all courses to be counted towards the BME degree with the exception of research or seminar units. Only courses that receive a letter grade of C or better may be counted toward degree requirement. In addition, a Quality Point Average (QPA) of 3.0 or better is required for any graduate degree in BME. Ph.D. and Research-Option M.S. students may count up to 12 units of 42-790, Practicum in BME, as coursework if performed at a medical center with clinical exposure.

BME courses are designated with a 42-xxx course number. Courses that are non-BME but have been pre-approved to count towards degree requirements can be found in the Course Catalog. If a student is interested in counting a course that is not listed in the Course Catalog, he/she must petition the Department by filling out the BME Course and Core Area Petition Form (found under “forms” on the Graduate Student Portal) and submitting it to GAC for approval prior to the first day of classes.

Students should note that, except for the switching from BME M.S. to BME Ph.D. program (see Section 1.3.1), course(s) that has been counted toward a degree cannot be counted toward fulfilling course requirements for the BME degree, unless explicitly authorized for a particular program as set forth in the specified requirements for the program, or by the department head(s) of the primary department(s) of the graduate student.

2.1 Degree Requirements

2.1.1 Academic Requirements for the Research-Option M.S. Degree

Students in the Research-Option M.S. program should expect to spend two academic years in full-time study (21 calendar months) or equivalent. This program does not have a full-time residency requirement, and may be completed entirely on a part-time basis. However, foreign students should check with OIE for legal requirements regarding part-time status.

The first year of Research-Option M.S. education is predominately devoted to satisfying the course requirements and laying the groundwork for the research project, while the summer and the second year is devoted primarily to research. A Research-Option M.S. Completion Worksheet is available at the Graduate Student Portal site to help with planning. The following is a summary of requirements:

1. The student must satisfactorily complete a minimum of 96 units, out of which at least 72 units must be formal coursework in the general area of biomedical engineering. No more than 24 units may be advanced undergraduate level courses (300 or 400 level).
2. Core course requirement – One course each of at least 9 units from three core areas chosen from the following list:
   - Molecular/Cellular Biology
   - Physiology
   - Bioimaging/Bioinformatics
   - Biomaterials
   - Biomechanics
A list of courses for each core area is available at the Graduate Student Portal.

3. A maximum of two courses may be taken through cross registration from outside Carnegie Mellon University. Students should check with Enrollment Services for rules and restrictions of cross registration and contact the Graduate Program Administrator well before the beginning of the semester for arrangement. Additional outside courses may be accepted upon GAC petition and approval (see Section 2.1.8).

4. The student must register and receive a passing grade for 42-701, Biomedical Engineering Seminar, for each semester.

5. At least 24 units out of 96 must be 42-890, M.S. Research. Students are required to enroll in, and satisfactorily pass 42-890, M.S. Research each semester for a minimum of 12 units per semester. Students who failed 42-890 for any semester are disqualified for the Research-Option M.S. degree but may petition GAC to switch to the Practicum-Option M.S. program.

6. The student must take the online training for Responsible Conduct of Research (see Section 2.1.12) and submit the certificate to the Graduate Program Administrator.

7. The student must register for 42-899, M.S. Research Final Report, during the final semester.

8. Course selection must be approved by the faculty advisor or the Graduate Program Administrator. Any course that is not pre-approved for BME must be approved via petition to the GAC before taking the course.

9. The student must submit an original M.S. Research Final Report. The report must meet the approval of the advisor, a BME faculty member as a reader (core, courtesy or adjunct), and the BME Department Head. The report must be in one of the following formats with a signed title page (available at the Graduate Student Portal site):
   - College of Engineering’s thesis format.
   - A submitted journal manuscript of a similar substance to that of an M.S. thesis, with the student as the lead author.
   - A published or accepted official institutional technical report of a similar substance to that of an M.S. thesis, with the student as the lead author.

The report, in PDF format, should be sent to the Graduate Program Administrator, along with the signed title page and the Research-Option M.S. Completion Worksheet found on the Graduate Student Portal, before the final grade due date. The Graduate Program Administrator will verify all the requirements for degree certification. There is no requirement of public presentation or defense.

### 2.1.2 Academic Requirements for the Practicum-Option M.S. Degree

Students in the Practicum-Option M.S. degree should expect to spend one to one and half academic year (9-16 calendar months) in full-time graduate study, although a shorter period may be possible for Carnegie Mellon University students who entered the program under College of Engineering’s Integrated Master’s/Bachelor’s Degree Program. In either case, students must meet a minimal full-time residency requirement of one Fall or Spring semester. A Practicum-Option M.S. Completion Worksheet is available at the Graduate Student Portal site to help with planning. The following is a summary of requirements:

1. The student must satisfactorily complete at least 96 units, out of which at least 84 units must be formal coursework in the general area of biomedical engineering. No more than 27 units may be advanced undergraduate level courses (300 or 400 level).
2. Core course requirement – One course each of at least 9 units from three core areas chosen from the following list:
   - Molecular/Cellular Biology
   - Physiology
   - Bioimaging/Bioinformatics
   - Biomaterials
2.1.3 Academic Requirements for the Dual Master BME/ETIM Degree

Students in the dual Master BME/ETIM degree spend two years in full-time graduate study. The dual degree program starts with the BME Practicum-Option M.S. Program for one (Fall) semester, followed by the ETIM program for two (Spring/Fall) semesters plus a Summer internship. The student then returns to BME to finish the requirements for the BME Practicum-Option M.S. degree. Students may double-count some qualified technical elective courses toward both degrees. Contact the ETIM advisor for specific policy details. The requirements are otherwise identical to those for Practicum-Option M.S.

2.1.4 Academic Requirements for the Direct-Entry Ph.D. Degree

Students who have not already obtained an M.S. degree in a BME-relevant field are accepted into the Direct-Entry Ph.D. program. Students should expect to spend four to five years full-time, or equivalent on Ph.D. training, with a required minimum of one-year full-time residency at Carnegie Mellon University. The first year of study is usually devoted to taking courses and laying the foundation for thesis research (which also serves as the basis for the Qualifying Examination). The coursework is generally completed during the second year, when the effort is shifted predominantly to thesis research through the remaining years of training. It is strongly recommended that Direct Entry Ph.D. students accumulate at least 72 course units by the end of the fourth semester counting summer, and complete 84 units of formal course requirement by the end of the second year. A Completion Worksheet for Direct-Entry Ph.D. students is available at the Graduate Student Portal to help with planning. The following is a summary of requirements:

- Biomechanics
  A list of courses for each core area is available at the Graduate Student Portal site.

3. At most, one course may be taken through cross registration from outside Carnegie Mellon University. Students should check with Enrollment Services for rules and restrictions of cross registration and contact the Graduate Program Administrator well before the beginning of the semester for arrangement. Additional outside courses may be accepted upon GAC petition and approval (see Section 2.1.8).

4. The student must register and receive a passing grade for 42-701, Biomedical Engineering Seminar, for each semester.

5. The student must complete a Practicum in BME, for 12 units, such that the total units from courses and Practicum meet the minimal requirement of 96 units. The Practicum requirement may be met by the following:
   - Taking the Clinical Option of 42-790 at a local medical center
   - Taking one of the courses that meet the practicum requirement (42-699E, 42-699G, 42-699L, 42-735). The course may still count toward core requirement, if so specified in the Core Table, or as an elective course. However, the units may be counted only once toward the total unit requirement
   - For students who plan to graduate in 16 months, performing full-time summer research with a BME faculty advisor upon agreement of the faculty member. The arrangement must be made well ahead of time, and the Graduate Program Administrator must be informed before starting the practicum. No tuition is charged for summer research.
   - For CMU graduates who have done research with a BME faculty mentor previously, continuing the research project upon agreement of the mentor while registering for at least 12 units of 42-790. The student must notify the Graduate Program Administrator before starting the practicum.

6. Eligible Bioengineering courses taken at the University of Pittsburgh as a Carnegie Mellon University undergraduate student and never used for obtaining a degree count as cross-registered courses. See point #3.

7. Course selection must be approved by the assigned advisor or the Graduate Program Administrator. Any course that is not pre-approved for BME must be approved via petition to the GAC before taking the course.
1. The student must satisfactorily complete 192 units, of which 84 units must be formal coursework. No more than 21 units may be advanced undergraduate level courses (300 or 400 level).

2. At least 24 units out of 192 must be Ph.D. Thesis Research (42-990). Students are required to enroll in and satisfactorily pass 42-990, Ph.D. Thesis Research each semester for a minimum of 12 units per semester.

3. Core course requirement – One course each of at least 9 units from three core areas chosen from the following list:
   - Molecular/Cellular Biology
   - Physiology
   - Bioimaging/Bioinformatics
   - Biomaterials
   - Biomechanics

   A list of courses for each core area is available at the Graduate Student Portal site.

4. At most two courses may be taken through cross registration from outside Carnegie Mellon University. Students should check with Enrollment Services for rules and restrictions of cross registration and contact the Graduate Program Administrator well before the beginning of the semester for arrangement (see Section 2.1.8).

5. The student must take the online training for Responsible Conduct of Research (see Section 2.1.12) and submit the certificate via the Graduate Review web site.

6. The student must register and receive a passing grade for 42-701, Biomedical Engineering Seminar, for each semester.

7. Course selection must be approved by the assigned advisor or the Graduate Program Administrator. Any course that is not pre-approved for BME must be approved via petition to the GAC before taking the course.

8. The student must register and receive a passing grade for three semesters of 42-996, Teaching Assistantship, to satisfy the teaching requirement (see Section 2.1.9).

9. The student must register and receive a passing grade for 42-997, Ph.D. Qualifying Examination (see Section 2.2).

10. The student must register and receive a passing grade for 42-998, Ph.D. Proposal Examination by the end of the ninth semester in residence (see Section 2.3).

11. The student must register and receive a passing grade for 42-999, Ph.D. Thesis Defense, during the final semester. The policy governing the preparation of the Ph.D. Thesis and Thesis Defense is given in Section 2.4. Any publication based on the thesis research should be prepared in consultation with the advisor.

2.1.5 Academic Requirements for the Advanced-Entry Ph.D. Degree

Students who have already obtained an M.S. degree or equivalent in a BME-relevant field are accepted into the Advanced-Entry Ph.D. program. Students should expect to spend three to four years full-time or equivalent on Ph.D. training, with a required minimum of one-year full-time residency at Carnegie Mellon University. The first year is usually devoted to taking courses and starting early stages of thesis research. Starting the second year, the effort is devoted principally to thesis research. A Ph.D. Completion Worksheet for Advanced-Entry Ph.D. students is available at the Graduate Student Portal site to help with planning. The following is a summary of requirements:

1. The student must satisfactorily complete 96 units, among which 42 units must be formal coursework and no more than 9 units may be advanced undergraduate level courses (300 or 400 level).

2. At least 24 units out of 96 must be Ph.D. Thesis Research (42-990). Students are required to enroll in and satisfactorily pass 42-990, Ph.D. Thesis Research each semester for a minimum of 12 units per semester.

3. One course of at least 9 units from each of three core areas chosen from the following list:
   - Molecular/Cellular Biology
   - Physiology
- Bioimaging/Bioinformatics
- Biomaterials
- Biomechanics

A list of courses for each core area is available at the Graduate Student Portal site.

4. At most one course may be taken through cross registration from outside Carnegie Mellon University. Students should check with Enrollment Services for rules and restrictions of cross registration and contact the Graduate Program Administrator well before the beginning of the semester for arrangement. Additional outside courses may be accepted upon GAC petition and approval (see Section 2.1.8).

5-11. The same as those in Section 2.1.4 except that the Ph.D. Proposal Examination must be passed by the end of the eighth semester in residence.

2.1.6 Academic Requirements for the M.D.-Ph.D. Degree

The BME Department participates in a combined M.D.-Ph.D. Program with the University of Pittsburgh School of Medicine to give selected medical students the opportunity to receive both a Doctor of Medicine (M.D.) from the University of Pittsburgh and a Ph.D. in Biomedical Engineering from Carnegie Mellon University.

Students formally enter Ph.D. studies after completing their second year of medical school training at the University of Pittsburgh School of Medicine. The student may elect to begin his/her research at Carnegie Mellon University during the summer before and/or after the first year, and after the second year of medical school, provided a qualified advisor agrees to supervise the research. The student may also choose to rotate through up to three different laboratories of potential interest at Carnegie Mellon University or University of Pittsburgh during these summers to facilitate the selection of research groups. Completion of the Ph.D. portion of the program is targeted at three to four years of full-time study. After receiving the Ph.D. Degree, the student resumes his/her M.D. training, completing the last two years at the University of Pittsburgh School of Medicine.

The requirements for the Ph.D. degree are identical to those for the Advanced-Entry Ph.D. program (see Section 2.1.5) in terms of coursework, thesis research, TA responsibilities, and seminar attendance, except that there is no core area requirement although all courses must remain BME relevant. The student may discuss with his/her advisor to determine the most beneficial courses to take according to his/her background and research interests.

2.1.7 Waiver of Core Areas

If a student believes he/she is already proficient in a core area due to prior training he/she may petition to have the core area waived. Students may petition to have up to two core areas exempt from the requirements. To be eligible for exemption, the course must be at a graduate level with a grade of B or better.

To file a petition the student must complete and submit the Petition to Waive Core Area form (see Graduate Program Administrator) and all corresponding materials as instructed on the form. Course petitions should be filed before the course starts. Retro-active petitions will not be considered for approval.

Petition for core area waiver alone does not transfer the course units or reduce the total unit requirement. Instead the student gains the flexibility to apply the units intended for a core course to an elective course, which must remain relevant to biomedical engineering to be counted toward the degree. If the units earned for the course(s) under petition have never been used to satisfy any prior degree, the student may petition to be both exempt from a core area(s) and to have the units counted towards graduate degree requirements thus reducing the required number of units for graduation. This is explained in the next Section.

2.1.8 Transfer of Course Credits

Students requesting to transfer credits from any institution other than Carnegie Mellon University must receive special approval first from the BME Department then from the College of Engineering. Students may petition to transfer a
maximum of 24 units of coursework. In order to be eligible for petition the course must be at the graduate level and the grade must be B or better. In addition to the College of Engineering Credit Transfer Request form the student must also submit a course syllabus, proof that course is graduate level, official transcript, documentation from previous institution that the course was not counted towards a previous degree. If the student wants to use the transferred course to meet a core requirement he/she should see the Graduate Program Administrator to discuss the procedure. The GAC will inform the student of its initial decision within two weeks of receipt. Final approval by the College of Engineering Dean’s Office will be sought by the GAC on the student’s behalf.

Carnegie Mellon University students who entered the Practicum-Option M.S. program under College of Engineering’s Integrated Master’s/Bachelor’s Degree Program or MCS/SCS students applying via the streamlined application form may count all eligible BME (42-xxx) courses that have not been used for fulfilling the B.S. degree requirements. The Department issuing the B.S. degree must send a written notification to the Graduate Program Administrator confirming that courses have not been counted for the previous degree. All transferred courses must be approved by the Graduate Program Administrator well in advance of graduation.

2.1.9 Teaching Assistant Assignment and Teaching Requirement for Ph.D. Students

All Ph.D. students must register and receive a passing grade for three semesters of 42-996, Teaching Assistantship. Ph.D. students are expected to take the Teaching Assistantship seriously even though it is not directly linked to a student’s financial support. The units received from this course are not counted toward Ph.D. unit requirement. Poor performance will be discussed during the Ph.D. Performance Review. Assignments are made by the Department Head and Associate Department Head and announced at the beginning of each semester. A student may volunteer to assist in teaching after fulfilling his/her three-semester requirement, with permission of his/her advisor and with possible financial compensation in addition to the stipend. This can be done at most two times after the teaching requirement has been fulfilled.

M.S students may apply for a teaching assistant position by completing the M.S. Teaching Assistant Application found on the Graduate Student Portal (under the “forms” section). M.S students are not guaranteed teaching positions and it is not required for degree completion. M.S students who work as a T.A will receive financial compensation.

The average workload of a teaching assistant is approximately 5-6 hours per week. Teaching Assistants provide help and advice to students, grade homework assignments and projects, supervise lab exercises, and occasionally deliver lectures. Teaching Assistants should work closely with the course instructor to understand and fulfill expectations. To be an effective teaching assistant, the student should be familiar with the course material, and should obtain copies of the class notes and solutions of problem sets. If the teaching assistant is uncertain if he/she has enough background in any part of the course, he/she should audit the course, thereby putting additional time and effort into the assignment.

2.1.10 ITA Test for Nonnative English Speakers

Both Pennsylvania State Law (English Fluency in Higher Education Act) and Carnegie Mellon University policy require that all nonnative speakers of English pass a test before they can work as a Teaching Assistant (T.A.). Upon arriving on campus, nonnative English speaking Ph.D. students must check-in with the Intercultural Communication Center to schedule a placement interview, which assesses what actions may need to be followed before qualifying the student as a Teaching Assistant. The placement interview is followed by an official International Teaching Assistant (ITA) Test. The rules on who must take the ITA Test and the level of performance required for various teaching duties are specified at the ITA web site. The Department will arrange for Ph.D. and M.S. students to take the ITA test as appropriate.

2.1.11 Seminar Requirement

BME students are required to enroll in and attend BME Seminar 42-701 or 42-801 each semester (Fall and Spring). Students registering for the 0-unit option 42-701 are expected to attend at least 10 seminars per semester. Part-time students should attend an equivalent number. Students must submit notes to the Graduate Program Administrator after each seminar, which are used for assigning a passing/not passing grade. Students registering for the 3-unit option 42-
801 are expected to attend all the regular seminars and to submit a written report after conducting a follow-up self-study, which is used for assigning a letter grade.

Students with schedule conflicts may substitute a BME seminar with a BME-relevant seminar at Carnegie Mellon University or another local institution (i.e. University of Pittsburgh). Students should still register for 42-701 even if they must substitute the seminars regularly. The date, title, speaker, and location of the alternative seminar attended must be included in the notes submitted to the Graduate Program Administrator. Students attending fewer than 10 seminars in a semester will receive a grade of Incomplete until additional BME-relevant seminars are attended to reach 10. Seminars attended before the beginning of a semester cannot count, and extra seminars may not be carried forward.

Students registering for 42-801 are expected to attend all BME seminars regularly as for other classes. Substitution is allowed only under unexpected circumstances, and must receive prior approval of the instructors. Students with multiple absences may receive a grade below C, such that no unit may be counted toward degree requirements.

2.1.12 Responsible Conduct of Research Requirement
In compliance with the requirement of various granting agencies, College of Engineering requires Ph.D. and Research-Option M.S. students to finish an online course on Responsible Conduct of Research (RCR). Each student must take at least one base-level module, which may be Physical Science RCR, Biomedical RCR, or RCR for Engineers. The first are suitable for most students while RCR for Engineers delves deeper into issues of intellectual properties and work with industry. Students doing research on human subjects should take Biomedical Research Refresher. The student may consult with the advisor on which course to take. The training must be completed no later than the beginning of the second semester in residence. Upon the completion of the training, the electronic version of the certificate should be sent to the Graduate Program Administrator or uploaded onto the Performance Review site for Ph.D. students.

2.2 Ph.D. Qualifying Examination
The purpose of the Ph.D. Qualifying Examination is to assess the student’s potential as an independent researcher, as well as general communication skills and knowledge of biomedical engineering. Successfully passing the Qualifying Examination admits students to the candidacy of Ph.D. and qualifies students for subsequent stages of degree qualification. Students should register for 42-997, Ph.D. Qualifying Examination, only in the semester when they are taking the Ph.D. Qualifying Examination for the first time, and should not register for any retakes.

2.2.1 Timetable
Both Direct-Entry and Advanced-Entry Ph.D. students are required to take the examination after the first three semesters of residence (summer counts as a semester). Students who are initially admitted into the BME M.S. program and then transferred to the Ph.D. program may complete the examination at an earlier date upon the student’s request. The examination is scheduled centrally by the Department to take place within the second and third weeks of the Fall and Spring semester.

2.2.2 Examination Committee
The Ph.D. Qualifying Examination Committee consists of three BME core, courtesy or adjunct faculty members, with at least one of them in the general area of research. The GAC makes the ultimate decision on the committee membership; however, the advisor may send suggestions, along with the title of the written document, to the GAC for consideration. GAC is under no obligation to honor the recommendation. The advisor will participate in the examination as a silent observer.

2.2.3 Written Document
The written document for the Ph.D. Qualifying Examination is based on the research performed since the student entered the Ph.D. program. An electronic version of the document must be submitted to the Graduate Program Administrator and all the committee members by the last business day before classes begin. Printed documents should
be delivered at committee member’s request. The student may solicit no more than editorial comments from their advisor. The format for the document is as follows:

- A cover page with the title of the document, the student’s name, the name of the student’s advisor, and an abstract of 300 words or less.
- A maximum of ten pages, including tables, figures, and literature cited but not counting the cover page, describing the work on which the student’s oral presentation is to be based. The document should include an introduction of pertinent background, the methods and results of research performed, and a discussion that covers interpretation of the results in addition to future development and potential broad impact.
- Format specifics: letter-size paper, 1-inch margins on top, bottom, right and left, 12-point Times Roman font, double spacing with no more than 23 lines per page.

2.2.4 Oral Presentation and Examination

The oral examination starts with a 30-minute presentation by the student, followed by up to 45 minutes of Q&A by the Committee. Questions for the examination must be relevant at least in a broad sense to the written document or oral presentation. The student should demonstrate a thorough understanding of the purpose and significance of the research, the fundamental principles involved in the research, the literature appropriate to the research, the meaning of the research results, and the broad context of prior work in similar areas. The student should demonstrate complete understanding of the material included in the written document. The ability to communicate in written and oral formats will also be assessed.

This examination is not intended to evaluate a research proposal or a project in completion. The intention is to gauge the student’s understanding of basic issues and concepts relevant to any materials included in the written document and/or oral presentation, as well as the inquisitiveness and general proficiency in logical thinking relevant to the research. Thus, pertinent coursework, its extensions into the research realm, life/medical science issues applicable to the written document, are all appropriate question topics and thus study areas. The advisor and fellow graduate students may participate in the preparation exercises.

2.2.5 Outcome of the Examination

Following the examination, the student is asked to leave during a brief committee discussion. A decision about the outcome of the examination is not reached at this point. Deliberation of the outcome of the examination involves all the BME faculty members who participate in a subsequent faculty meeting, when the committee members present their observations and recommendations. The ensuing discussion then leads to a decision of Pass, Retake, or Fail.

The evaluation process requires each committee member to assign a grade to the student’s performance, on a scale of 1-5 where 1 represents Clear Fail and 5 Excellent. Grades will be assigned to each of the following aspects and to the overall performance.

- Student can express him/herself well in written form as demonstrated by written report
- Student can express him/herself well in oral form as demonstrated by oral presentation
- Student is poised under pressure as demonstrated by student’s management of Q&A session
- Student clearly understands project
- Student clearly understands the relevant science & engineering background
- Student can set project in the context of what has been done by others
- Student is productive
- Student understands results/expected results
- Student can go beyond the surface level in explaining phenomena
- Student can see the path forward
The advisor may inform their advisees of the final decision after the faculty meeting. An official email from the Department Head will follow shortly afterwards, which will include a summary feedback for the student prepared by the Chair of the Qualifying Examination Committee.

The grade for 42-997, Ph.D. Qualifying Examination, is entered as follows: students who receive a Pass for the examination receive a “P” (passing). Students with a Retake or Fail receive an “I” (Incomplete). Depending on the outcome of the retake and/or the decision of the student to retake or not to retake the examination, the “I” is then changed to either a “P” or “N” (Not Passing).

2.2.6 Recourse upon Failure

If the student is unsuccessful in the initial round of the examination, he/she is permitted to retake the examination within one semester, with the timing determined by the BME faculty. The same written document and oral presentation used in the first round may be revised appropriate and used for the second round, or the student may elect to change the topic. In most cases there is no change in committee membership for the retake. Oral presentation for the retake may be shortened as appropriate.

If the student is unsuccessful in the retake, he/she may be offered the option of pursuing a Research-Option M.S. degree with the consent of advisor. To facilitate this transition, tuition and stipend support as administered by the Department will continue, but possibly at a reduced level (see Section 1.3.2). If the student cannot complete all of the requirements necessary for the terminal M.S. degree after up to one semester of provisional funding, he/she may continue the M.S. training with the consent of the advisor but without financial support. Alternatively, students who fail the Ph.D. Qualifying Examination may pursue the Practicum-Option M.S. degree. In this case, any tuition support administered by the Department is terminated immediately, and the stipend ends the month after the student fails the Ph.D. Qualifying Examination.

If a student is unsuccessful in the initial round of the examination and does not wish to exercise the option to retake the examination, any tuition support administered by the Department ends immediately and the stipend ends the month after the student fails the examination. The student is responsible for any outstanding balance due the University and this amount may be deducted from the student’s final stipend.

2.3 Ph.D. Proposal Examination

The Ph.D. Proposal Examination represents the second stage of qualification towards a Ph.D. degree. The student should regard the Ph.D. Proposal Examination as both a test of his/her fitness to complete the Ph.D. research on the chosen topic, as well as an opportunity to receive early input from the prospective Ph.D. Thesis Committee on the proposed research. The knowledge necessary for conducting the research, a clear conception of the scope of the work, and familiarity with the methods to be used will be assessed at the Proposal Examination. Students should register for 42-998, Ph.D. Proposal Examination, only in the semester when they are taking the examination for the first time, and should not register for any retakes.

2.3.1 Timetable

The Ph.D. Proposal Examination occurs when a student has completed around one third of the Ph.D. research, which amounts to approximately one chapter in the body of a typical Ph.D. thesis. It is the responsibility of the student and the advisor to ensure that the examination take place at this strategic juncture. In most cases the Ph.D. Proposal Examination takes place during the seventh or early part of the eighth semester counting summers. In all cases the examination must be PASSED before the end of the ninth semester for Direct-Entry students, or the end of the eighth semester for Advanced-Entry students. When planning for the Ph.D. Proposal Examination, the student must take into account the possibility of a scheduling delay or retake in relation to this firm deadline.
2.3.2 Ph.D. Proposal Committee

As soon as a student is ready to take the Ph.D. Proposal Examination, well ahead of the final deadline stated above, he/she should consult the advisor to identify suitable members for the Ph.D. Proposal Committee, which most often also serves as the student’s Ph.D. Thesis Committee. The Ph.D. Proposal Committee is assembled by the student and advisor. The student must contact prospective members to seek their consent to serve on the committee. The student is advised to start scheduling the Ph.D. Proposal Examination a few months in advance of the desired date, as it can be difficult to find a suitable time for all the committee members especially during the summer. The Ph.D. Proposal Committee consists of:

- Student’s advisor plus a minimum of two faculty members from the BME Department. Courtesy and adjunct faculty members count towards this requirement.
- One member from outside the BME Department, who may be within or outside Carnegie Mellon University.

2.3.3 Written Document

An electronic version of the proposal must be submitted to the Graduate Program Administrator and all the committee members two weeks before the Proposal Examination. Upon request by any committee members, the printed document should be delivered by the student. Discussions between the student and the advisor are allowed during the preparation of both the written document and the oral presentation.

The written document for the Proposal Examination should define the thesis problem and include an outline for the plan of attack, which the student should be prepared to defend. While the outcomes of an investigation may be impossible to predict, the student should be aware of various possibilities and contingencies, and address the necessary research alternatives. An organizational table outlining the time to be allotted to various facets of the problem is helpful.

The document follows the format of the standard NIH R01 grant application:

- Thirteen pages is the upper limit for the proposal document including one page of Specific Aims and twelve pages for research strategy (see below). Figures, tables and references do NOT count towards the 12-page limit, unlike the NIH format where only references are not counted.
- The document should be in Arial, Helvetica, Palatino Linotype, or Georgia typeface, with a black font color and a font size of 11 points or larger. A Symbol font may be used to insert Greek letters or special characters, following the same font size requirement. Type density, including punctuation marks and spaces, must be no more than 15 characters per inch. Type may be no more than six lines per inch. Use letter paper size (8 ½” x 11), with at least one-half inch margins (top, bottom, left, and right) for all pages. No information should appear in the margins, including the student’s name and page numbers. Use only a standard, single-column format for the text.

Sections (adapted from NIH SF424 R&R/PHS 398 Version B):

A. Specific Aims: State concisely the goals of the proposed research and summarize the expected outcome(s), including the expected impact of the results on the research field(s) involved. List succinctly the specific objectives of the research proposed, e.g., to test a stated hypothesis, create a novel design, solve a specific problem, challenge an existing paradigm or clinical practice, address a critical barrier to progress in the field, or develop a new technology. Specific Aims are limited to one page.

B. Research Strategy: Organize the Research Strategy in the order and following the instructions below. Start each section with the appropriate section heading – Significance, Innovation, Approach. Cite published experimental details in the Research Strategy section and provide the full reference in the Bibliography and References Cited section. Research Strategy is limited to twelve pages.

  a. Significance
     - Explain the importance of the problem or the critical barrier to progress in the field that the proposed project addresses.
 Explain how the proposed project will improve scientific knowledge, technical capability, and/or clinical practice in one or more broad fields.
 Describe how the concepts, methods, technologies, treatments, services, or preventative interventions that drive this field will be changed if the proposed aims are achieved.

d. Innovation
 Explain how the application challenges and seeks to shift current research or clinical practice paradigms.
 Describe any novel theoretical concepts, approaches or methodologies, instrumentation or interventions to be developed or used, and any advantage over existing methodologies, instrumentation, or interventions.
 Explain any refinements, improvements, or new applications of theoretical concepts, approaches or methodologies, instrumentation, or interventions.

c. Approach
 Describe the overall strategy, methodology, and analyses to be used to accomplish the specific aims of the project. Include how the data will be collected, analyzed, and interpreted.
 Discuss potential problems, alternative strategies, and benchmarks for success anticipated to achieve the aims.
 If the project is in the early stages of development, describe any strategy to establish feasibility, and address the management of any high-risk aspects of the proposed work.
 Point out any procedures, situations, or materials that may be hazardous to personnel, and precautions to be exercised.
 Discuss the preliminary studies and data pertinent to this project. Preliminary data can help to establish the likelihood of success of the proposed project.

2.3.4 Oral Presentation and Examination
The student and his/her advisor should establish a date and time for the examination and inform the Graduate Program Administrator, who may assist with the reservation of the conference room and required audio-visual equipment. The student should also inform the Graduate Program Administrator of the proposed thesis title and the committee membership, for the preparation a yellow signature card that the student should collect before the examination.

The presentation has two parts: open and closed. The open part starts with a 45-minute presentation by the student, based on the written document, followed by a 15-minute Q&A session with the audience. The closed part is reserved for up to 45-minutes of Q&A by the committee. The student is then asked to leave the room during committee-only deliberation. Unlike the Ph.D. Qualifying Examination, the advisor participates actively in the process of Ph.D. Proposal Examination. In addition, a decision is typically reached by the Committee during the deliberation without the involvement of the rest of the BME faculty, and is conveyed to the student immediately afterwards.

2.3.5 Outcome of the Examination
The outcome of the examination is a Pass/Retake/Fail decision by the Ph.D. Proposal Committee. As for the Qualifying Examination, the grade for is entered as follows: students who receive a Pass for the examination receive a “P” (passing). Students with a Retake or Fail receive an “I” (Incomplete). Depending on the outcome of the retake and/or the decision of the student to retake or not to retake the examination, the “I” is then changed to either a “P” or “N” (Not Passing).

Students who pass the examination should promptly bring the following to the Graduate Program Administrator:
 The yellow signature card with committee members’ signatures.
 Filled out ABD form.
Updated Ph.D. Completion Worksheet (available at the [Graduate Student Portal site](#)).

### 2.3.6 Recourse upon Failure

The Ph.D. Proposal Committee may reach a Fail decision if it perceives significant weaknesses in knowledge and/or a low probability for scholarly contributions in the proposed area.

If the Ph.D. Proposal Committee reaches a decision of Retake, financial support administered by the Department may continue at the normal level subject to approval by the advisor, until the deadline for the completion of the Ph.D. Proposal Examination as specified in Section 2.3.1.

If the Ph.D. Proposal Committee reaches a decision of Fail, the student must terminate the Ph.D. training. Financial support administered by the Department may continue at the discretion of the GAC but not beyond the semester in which the termination has been recommended.

Failure to take or retake the Ph.D. Proposal Examination by the deadline is designated as a Fail. The student may petition the GAC under unusual circumstances such as serious illness.

Students who fail the Ph.D. Proposal Examination may receive a Research-Option M.S. degree if he/she has fulfilled all the requirements by the end of the semester. No extension is allowed.

### 2.3.7 Thesis Assessment

The student should keep the Ph.D. Proposal/Thesis Committee abreast of the development after passing the Ph.D. Proposal Examination, holding periodic committee meetings in consultation with the advisor. At the minimum, one meeting, referred as the Thesis Assessment Meeting, must be scheduled with the Ph.D. Thesis Committee within 6 months of the intended defense date, to review the progress, seek input on the completion of research, and set a timeframe for the thesis defense. The student is responsible for coordinating the Thesis Assessment Meeting.

The meeting may follow any format or length deemed productive for evaluating the progress. Committee members may participate either in person or via telecommunication. The meeting should lead to a consensus on the timeframe for thesis defense and any additional research to be completed beforehand. Additional meeting(s) is required if this timeframe is determined as more than 6 months away. The student must file a report, using a posted form, after the meeting if the timeframe for thesis defense is confirmed as within 6 months. A limited grace period may be granted upon petition to the GAC if thesis defense cannot take place within 6 months, e.g. due to scheduling difficulties. Otherwise a new meeting must be organized.

Consistent with the grievance policy (Section 1.6), students may contact the Department Head or the GAC Chair if they experience unusual obstacles in arranging the Thesis Assessment Meeting, or if the requests from the meeting appear unreasonable. The student may request that a GAC representative be present at the meeting as an observer.

### 2.4 Ph.D. Dissertation and Thesis Defense

The Ph.D. Dissertation is the capstone of the Ph.D. research experience and a key requirement for the Ph.D. degree. Students should register for 42-999, Ph.D. Thesis Defense, only in the semester when they are taking the defense for the first time. Since it is an official record of work and achievements, there are special College of Engineering guidelines for its preparation and approval as described below.

The Ph.D. Thesis must embody the results of extensive research, be an original contribution to knowledge, and include materials worthy of publication. It should demonstrate the candidate’s ability to conduct an independent investigation, to logically interpret facts and phenomena revealed by the research, and to abstract principles upon which predictions and/or further developments can be made.

#### 2.4.1 Timetable

The time limit for the Ph.D. Thesis Defense is defined in Section 1.1.2, while the time limit for the financial support administered by the Department is governed by the separate Statute of Limitations for Financial Support (see Section
3.1.1.). The student is encouraged to contact members of the Ph.D. Thesis Committee and set the date of the Ph.D. Thesis Defense well in advance of the desired date.

2.4.2 Ph.D. Thesis Committee

In most cases, the Ph.D. Thesis Committee is the same as the Ph.D. Proposal Committee (Section 2.3.2). Changes in membership are allowed with the approval of the advisor, but must remain compliant with the guidelines for the Ph.D. Proposal Committee. The student is encouraged to keep the Ph.D. Proposal/Thesis Committee abreast of the development after passing the Ph.D. Proposal Examination. It is not uncommon to schedule meetings with the Ph.D. Thesis Committee between the Ph.D. Proposal Examination and the Ph.D. Thesis Defense, to review the progress and seek additional input from the Committee during the final stage of training.

2.4.3 Ph.D. Dissertation

The standards for the Ph.D. Dissertation are set by the College of Engineering and described at the College of Engineering Ph.D. policies site. Students who have been supported by an external fellowship or research grant must acknowledge the support on an Acknowledgements page. An electronic version of the Ph.D. Dissertation must be submitted to all the committee members at least two weeks before the Ph.D. Thesis Defense. Printed document should be delivered upon request by committee members.

2.4.4 Ph.D. Thesis Defense

The Ph.D. Thesis Defense is the opportunity for the student to highlight his/her accomplishments in an open presentation, and to answer detailed questions from the Ph.D. Thesis Committee and the public. The presentation should state the motivation of the research, put results in the broad context of biomedical engineering, and justify the conclusions of the research. The student must demonstrate that the accomplishments are original and meet international standards of excellence.

The student and his/her advisor should contact members of the Ph.D. Thesis Committee well in advance of the projected date of Ph.D. Thesis Defense and settle a time block of three hours on the agreed date. All committee members must participate in the Ph.D. Thesis Defense and at most one committee member may participate via teleconferencing. The student should reserve an appropriate room and required audio-visual equipment, with the help of the Graduate Program Administrator. At least two weeks prior the Thesis Defense, the student must provide the Graduate Program Administrator with a title and abstract for the Dissertation, the date and time of the Ph.D. Thesis Defense, and names of committee members. Any other materials required during the Ph.D. Thesis Defense should be coordinated beforehand with the Graduate Program Administrator. Any food or drink should be provided by the student.

The Graduate Program Administrator will create and post the announcement around campus and distribute an electronic notice to the university community. The student should obtain a yellow signature card from the Graduate Program Administrator before the Ph.D. Thesis Defense for collecting committee signatures upon successful completion of the Ph.D. Thesis Defense.

The Ph.D. Thesis Defense has two parts. The first part is a 45-minute presentation by the student, followed by a Q&A session with the audience and committee, which may last for up to two hours. Both parts of the examination are open to the public. The committee then privately deliberates on the outcome without the presence of the student, who will be informed of the decision immediately afterwards.

Students returning from ABS must register for at least five units of 42-990 Ph.D. Thesis Research for the semester of graduation. Foreign students should consult the Graduate Program Administrator and/or the Office of International Education to ensure the maintenance of a legal visa status.
2.4.5 Final Preparation of the Dissertation

The following table shows the due dates for the submission of Ph.D. Dissertation to the Ph.D. Thesis Committee, the BME departmental Office, and the College.

<table>
<thead>
<tr>
<th>Semester</th>
<th>Submission to the Thesis Committee</th>
<th>Submission of Final Document to the BME Office</th>
<th>Submission of Final Document to the College of Engineering Dean’s Office, for Graduation in the Current Semester</th>
<th>Submission of Final Document to the College of Engineering Dean’s Office, for Graduation in the Following Semester without Tuition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring</td>
<td>At least two weeks prior to the Ph.D. Thesis Defense</td>
<td>At least one week before the College of Engineering deadline</td>
<td>10 days before the Final Grades Due date (May 5, 2014)</td>
<td>NA</td>
</tr>
<tr>
<td>Summer</td>
<td>shown to the right, but no more than two weeks after the defense</td>
<td>Final Grades Due date (Aug. 12, 2014)</td>
<td>End of September</td>
<td></td>
</tr>
<tr>
<td>Fall</td>
<td></td>
<td>Final Grades Due date (Dec. 19, 2013)</td>
<td>End of January</td>
<td></td>
</tr>
</tbody>
</table>

The format of the electronic dissertation submission must follow the College of Engineering Dissertation Standard. Title and signature pages should follow exactly the format described in the College of Engineering Dissertation Standards. After completing the final revision of the Ph.D. Dissertation, the student should collect the signature(s) of the advisor for the signature pages before submitting the finalized Ph.D. Dissertation and the title and signature pages to the Graduate Program Administrator, who will collect the signature of the Department Head and the Dean on the signature page.

Students must submit their dissertation as an electronic file to the Graduate Program Administrator following the guidelines of Research Showcase (Carnegie Mellon institutional repository) as documented in the library Submission Procedures. Submitting a dissertation to ProQuest is optional; the university library will make the arrangement while the student pays a fee. Students must submit the Dissertation Checklist for Electronic Submission to the Graduate Program Administrator along with an electronic copy of their dissertation in .PDF format and hardcopies of title and signature pages.

No bound copy of the dissertation is required, but the Department will pay for the binding of up to three copies upon request; the student should check with the advisor to determine if any copies are needed, e.g., for the sponsor. The student is responsible for providing the hardcopies for bounding. An alternative format may be adopted by the student or the advisor for these bound copies. Copies of bound dissertation will be mailed to the address provided by the student.

If the submission of Ph.D. Dissertation is not completed in time for the current semester, the student must register for the following semester. However, tuition charged will be credited in full if the student is on official ABD status and if the Ph.D. Dissertation is submitted to College of Engineering Dean’s Office near the beginning of the following semester, as specified in the table above.

The following checklist is provided for the students’ convenience.

Dissertation Preparation and Submission Checklist:

- Send a copy of the Ph.D. Dissertation to members of the Ph.D. Thesis Committee at least 2 weeks prior to the examination date.
- Email the Graduate Program Administrator the title and abstract of the Ph.D. Dissertation, the names of the Ph.D. Thesis Committee members, and the time, date and location of the Ph.D. Thesis Defense at least 2 weeks prior to the examination.
- Obtain the yellow signature card from the Graduate Program Administrator before the Ph.D. Thesis Defense.
- After the Ph.D. Thesis Defense, complete any revisions as recommended by the committee.
- Have the advisor sign two copies of the signature page.
Bring the following to the Graduate Program Administrator:

- A digital copy of the dissertation as a single .PDF file (emailed or delivered in a memory device to the Graduate Program Administrator)
- Two copies of the title page
- Two copies of the abstract
- Two copies of the signature page containing the advisor(s) signature.
- One original signature page
- Signed yellow signature card, which should contain an address for mailing any bound Dissertation.
- Completed Dissertation Checklist for Electronic Submission form with signature and waiver of embargo period.

### 2.4.6 Recourse Upon Failure of Ph.D. Thesis Defense

Failure of the Ph.D. Thesis Defense is dealt with by the GAC on a case-by-case basis.

### 2.5 Checkout Procedure

Before leaving Carnegie Mellon University, the student should:

- Leave forwarding address, which may be home or work address, and name of the employer, for the Graduate Program Administrator. Ph.D. students may place the information on the yellow signature card.
- Return the keys and the Carnegie Mellon ID to the Graduate Program Administrator.
- Check with the Student Health Office regarding arrangements upon graduation.
- Make sure any outstanding balance is cleared through Student Accounts; the degree will be put on hold until this is done.
- Log onto the Commencement website in SIO and verify that the graduation information is correct. Pay special attention to the spelling of the name, the thesis title, the advisor name(s), the degree, and the forwarding address. Make any changes online.
- Complete the survey sent by Career Services.

### 3 FINANCIAL POLICIES

#### 3.1 Support

All Ph.D. students receive tuition and stipend support through the BME Department or external funding agencies. Students are guaranteed continued support, subject to successful progress evaluated each semester (see section 1.4). Students with externally administered financial support may receive partial support from the Department.

Upon entry to the M.S. program, students do not receive Departmental financial support. Research-Option M.S. students may receive partial financial support for research or teaching assistantship upon matriculation. Practicum-Option M.S. students may be considered for financial support through teaching assistantships only.

##### 3.1.1 Payday

Students receiving financial support must file an I-9 form, with proper documentation, with Human Resources on Henry Street as soon as possible upon arrival. Foreign students must also apply for and receive a U.S. Social Security before they are allowed to receive any financial support. The University makes monthly payments on the last working day of the month. Payment may be made as direct deposit into a bank account, or as a bank debit card carrying the equivalent credit. The latter should be picked up from the student’s mailbox in DH 2100 or PTC after 10:00 a.m. on paydays. Any problems should be reported promptly to the Graduate Program Administrator.
3.1.2 Statute of Limitations for Financial Aid

Ph.D. applicants whose highest level of education is a B.S. degree are admitted into the Direct-Entry program. The statute of limitations for financial support for Direct-entry Ph.D. students is fourteen (14) semesters of full-time residence with summers counting as semesters (equivalent to 4½ calendar years). Ph.D. applicants who have already obtained an M.S. degree may be admitted into the Advanced-Entry program. The statute of limitations for financial support for Advanced-Entry Ph.D. students is twelve (12) semesters of full-time residence with summers counting as semesters (equivalent to 4 calendar years).

In all cases, continuation of financial support is dependent upon satisfactory progress, evaluated through the Ph.D. Performance Review process (Section 1.4). If the Statute of Limitations for financial support expires, the student must submit the Application for Financial Support Beyond Statute of Limitations form (found under “forms” on the Graduate Student Portal) to the GAC to justify why additional funds should be provided. If approved, funding will be provided one semester at a time such that the student must submit a new petition each semester for further support. Students who lose financial support as a result may petition for reduced tuition (Section 1.1.3) or finishing the degree in absentia (Section 1.1.4). Financial support is terminated at the end of the month in which the student successfully defends his/her Ph.D. thesis.

3.2 Payment of Tuition and Health Insurance

Tuition and required fees are charged to student accounts before the start of each semester. Ph.D. and Research-Option M.S. students are expected to do research during the summer without taking courses, in which case they do not pay for summer tuition. In addition, courses such as 42-890, 42-792, 42-990, and various 0-unit graduate milestones do not invoke tuition, but other courses do. Some Practicum-Option may engage in full-time summer research, without tuition, as an option to fulfill the practicum requirement (see Section 2.1.2).

Department-administered financial support for Ph.D. students is provided in the form of a monthly stipend payment. As monthly stipend payment is received year-round (12 months), this payment also includes a portion of the tuition. The tuition portion is immediately deducted from the paycheck and applied to the student’s tuition balance. This process decreases the balance on the student account incrementally over the academic year such that at the end of each semester the tuition balance will reach zero. Any remaining balance on the student account then reflects unpaid health insurance, required fees, and other incidental charges such as library fines and health services visits, all of which are the responsibility of the student to settle directly with Enrollment Services. Partial financial support may be handled either in a similar manner or paid once in total. Students should routinely review their student accounts and contact the BME Business Manager or Associate Business Manager promptly to resolve any discrepancy. It is also crucial for the student to inform the Business Manager promptly of address changes, so that payment and tax information can be updated appropriately.

Carnegie Mellon University requires all graduate students to enroll in the University’s health insurance program. An insurance waiver must be filed if the student is covered as a dependent elsewhere. The enrollment year for health insurance runs from August 1st through the following July 31st. Full-time students who do not file an insurance waiver are automatically enrolled in the standard plan with the lowest premium. The premiums for various options of health, dental, and vision insurance, together with details of coverage, are listed at the Carnegie Mellon Health Insurance site.

3.3 Policies on Employment, Fellowships, Internships and Vacations

3.3.1 Policy on Outside Employment

Full-time Ph.D. and Research-Option M.S students are expected to devote complete attention and energy to their educational and research endeavors. Coursework and research assignments are planned to completely occupy full-time student’s time. Therefore, full-time research students are advised to avoid outside employment and concentrate on their graduate studies.
In exceptional cases, there may be opportunities for outside consulting or employment that would provide helpful experience complementary to graduate training, in addition to financial remuneration. Before assuming such commitments, including those within Carnegie Mellon University, Ph.D. and Research-Option M.S students must seek Department approval. All Ph.D. students, and M.S. students receiving department-administered financial support including teaching assistantship, are required to obtain consent from both their academic advisor and the Department Head. The Department may make adjustments to the financial support if the employment affects the time or effort of the student’s commitment.

Practicum-Option M.S. students that are not receiving any financial support from the Department may accept employment within or outside of the Carnegie Mellon University community without permission.

3.3.2 Policy on External Fellowships
A student receiving any kind of fellowship that is not administered through the BME Department must notify the Department of such support through the Graduate Program Administrator. The Department may make appropriate adjustments to the departmental financial support to maintain equitable treatment of students. This does not apply to financial awards provided by family or prior investments.

3.3.3 Policy on Internships
Internships often provide students with unique training opportunities. Research-Option M.S. students are permitted to accept paid or unpaid internship opportunities during summer months with the advisor’s permission. Ph.D students are permitted to accept paid or unpaid internship opportunities, during either summer months or academic year, with the permission of advisor and GAC with a petition sent through the Graduate Program Administrator. After receiving the permission and finalizing the arrangement, the Ph.D. student should inform the Graduate Program Administrator of any financial support so that stipend support may be adjusted as necessary. International students must consult with OIE to complete the appropriate paperwork to maintain legal Visa status. While participating in an Internship students should register for 42-792 Extramural Practicum.

3.3.4 Policy on Vacation Time
Students receiving full financial support through the Department are expected to continue with their research during academic breaks, including summer months, with the exception of official University holidays. Such support does not include paid time off for personal business or vacations. Students who intend to take a vacation for one or two weeks must seek prior approval from his/her advisor and possibly make up the work. Students wishing to take longer periods of personal time off must do so without financial support and must receive approval from their advisor at least four weeks prior to the planned departure except for emergencies. The student must then inform the Graduate Program Administrator, who will coordinate an appropriate adjustment of the stipend. Foreign students should consult with OIE before planning any extended vacation to ensure legal visa status and/or re-entry into the U.S.

4 FACILITIES, SERVICES AND SAFETY PROCEDURES

4.1 BME Department Facilities and Services
The BME Department Student Affairs office is located in Doherty Hall (DH) room 2100 and is open from 8:30-4:30, Monday through Friday during the academic year. The Department maintains a separate office in the Pittsburgh Technology Center (PTC) Building, at 700 Technology Drive. All students should use the Student Office as the point of contact with the Department.

4.1.1 Equipment and Supplies
The Student Affairs Office has one copier, which is not intended for personal or extensive copying, and other office equipment available for student use. Equipment is not available outside of regular office hours. There are numerous
University Copy centers throughout campus including Wean Hall 4602. For a full list see the Carnegie Mellon Campus Services. Large-scale copying is available at the Kinko’s Copy Center in the University Center and in the Publications and Printing Building.

Office supplies are not provided for student use. Supplies necessary for the student’s research should be either provided by the advisor or the student. Most items may be found at the Campus Bookstore located in the University Center.

### 4.1.2 The Student’s Office

Desk space is guaranteed to full-time Ph.D. graduate students and assigned to them by their advisor. For students involved in experimental research, the desk may be located in or near the laboratory. For students involved in theoretical research, the desk is generally in a shared office. The Department and its faculty make an effort to accommodate the desk needs of Research-Option M.S. students.

When assigned a key the office, the student should not, under any circumstances, pass on his/her keys to another student or lend them to anyone. The student is responsible for the keys issued and a record is kept in the student’s file until all keys are returned. At the termination of the studies, the student should return all keys to the Graduate Program Administrator or the appropriate facilities manager.

In most of the buildings, only the most basic janitorial services are provided. Therefore, many of the housecleaning chores in the space assigned to the student are the student’s responsibility. The Department may revoke desk assignment upon persistent negligence to maintain the desk/office space in good order. Maintenance requests should be managed through the advisor and his/her personnel. For an emergency repair after hours, call the Service Response Center directly at x8-2910 or Security at x8-2323. The Service Response Center manages emergency requests only.

### 4.1.3 Phone and Mail

To make business calls, the student should make arrangements with the advisor. For campus calls, dial 8 + the 4-digit extension (denoted 8-XXXX).

Each graduate student has a mailbox or folder in the mailroom of DH 2100. There is also a box for outgoing campus mail and outgoing stamped mail in both office locations. Mail is delivered and picked up at the mailroom once each day before 10 a.m. The student is responsible for the postage for personal mail.

The gray mailboxes on campus are for campus mail only; delivery is guaranteed the following day if mail is deposited before 6 p.m. There is a U.S. Post Office branch on the lower level of the University Student Center, open Monday through Friday from 8:30-4:00. In addition, the U.S. mailbox outside Baker Hall or the University Center has a 5:00 p.m. pick up.

To send packages for business, the student should make arrangements with the advisor and designated Administrative Assistant. The Department or building staff sends email notifications for packages, which should be picked up immediately. The packing slip should be sent to the Administrative Assistant if it is to be charged to the Department.

### 4.1.4 Travel

Students planning to travel for departmental business, with the advisor’s consent, may purchase the travel ticket(s) through a university-approved travel agent and charge directly to the Department. The student should contact the designated BME Administrative Assistant to complete the necessary forms. Otherwise, reimbursement should be coordinated through the designated BME Administrative Assistant.
4.2  Campus Facilities and Services

Student IDs are necessary for many university services including the use of athletic facilities, purchasing meal plans, special events, etc. More information can be found at the Carnegie Mellon ID Card site. Courtesy cards are available for spouses for a fee.

4.2.1  Computer Services

Each student is assigned an Andrew account automatically upon matriculation from the University's computing services. The Andrew account and password are used for email, secure Internet access, and logging on to many university computers.

4.2.2  Dining Services

A dining plan can be purchased through the University by accessing Carnegie Mellon Dining Services. Hours of operation may be verified by calling x8-8090. Some of the locations include: The University Center, Resnik Hall, food carts scattered around campus, including Wean Hall, Newell-Simon Hall, GSIA, and the Mellon Institute. There are also vending machines for snacks and drinks in various buildings across the campus.

4.2.3  Libraries

Students are invited to use the collections in the Roger Sorrells Engineering & Science Library, Mellon Institute Library and Hunt Library. For more information, see the Carnegie Mellon University Libraries site, which also lists information on online journals and interlibrary loans. Circulating material may be borrowed by presenting a valid Carnegie Mellon ID card. Each library has a reserve book form for professors to reserve books as assigned reading in his/her class. Members of Carnegie Mellon University also have access to the University of Pittsburgh libraries. Online journals from the University of Pittsburgh may be accessed by requesting a one-day login and password at the Hillman Library.

4.2.4  Athletic Facilities

Students are welcome to use the athletic and recreational facilities in the University Center, including the swimming pool, handball courts, weight room, golf room and main gym, as well as the tennis courts. These facilities may be used during scheduled periods when they are not in use for instructional purposes. A student may be asked to show a Carnegie Mellon I.D. card for identification or for obtaining a permit. There is a charge for use of some facilities. See the Carnegie Mellon Tartans site for more details.

4.2.5  Counseling & Psychological Services

Counseling & Psychological Services (CAPS) affords the opportunity for students to talk privately about issues that are significant for them in a safe, confidential setting. Students sometimes feel confused about why they are feeling upset and perhaps confused about how to deal with it. An initial consultation with a CAPS therapist will clarify options and provide a recommendation to the appropriate mental health resource at Carnegie Mellon or the larger Pittsburgh community. CAPS services are provided at no cost. There are, however, limits on the number of sessions. Follow-up psychiatric services and off-campus referrals for longer term therapy are at the client’s expense. Appointments can be made in person or by telephone, 412-268-2922.

4.2.6  Health Services

University Health Services (UHS) is staffed by physicians, advanced practice clinicians and registered nurses who provide general medical care, allergy injections, first aid, gynecological care and contraception as well as on-site pharmaceuticals. There is a small visit fee to see the physicians and advanced practice clinicians; nurse visits are free of charge. Fees for prescription medications, laboratory tests, diagnostic procedures and referral to the emergency room or specialists are the student’s responsibility. UHS also has a registered dietician and health promotion specialist 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. It also covers most of the fees for care at Student Health Services. Graduate students should contact UHS to discuss options for health insurance for spouses, domestic partners and dependents. Appointments can be made by visiting UHS’s website or by telephone, 412-268-2157.

4.2.7 Parking Facilities
Parking & Transportation Services manages parking passes and parking fines. Fines are given for illegal parking violations. Many of the local streets near the campus have parking limited to residents.

Due to the inconvenience of transport, students with office in PTC receive substantial subsidy for purchasing the PTC parking permit, which may also be used for waiving parking fee at the East Campus garage after validating the ticket at the Parking Services office in the garage. Students in PTC should contact the Business Manager for the arrangement before purchasing the parking permit.

4.2.8 Publications and Web Resources
The following regular Carnegie Mellon University communications are available online or at the information desk in the University Center.

- Tartan: The Carnegie Mellon student weekly publication that highlights campus activities such as athletic schedules and scores, lectures, seminars, meetings, concerts art exhibits, and other information.
- Tartanswiki: Campus resource initiated by the Student Body President and intended to be an all-inclusive information source for students, staff, and faculty—any member of the Carnegie Mellon community. Login with the Andrew ID to create, edit and share campus knowledge.
- Campus Calendar: A weekly listing of current campus events (plays, concerts, recitals, seminars, etc.) and local events of special interest to the academic community.
- 8½ x 11 News: A single-sheet weekly update of news about campus events.
- The Word: 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 their full potential as a member of the Carnegie Mellon community.

4.2.9 University Police
The University Police Department is located at 300 South Craig Street, Room 199 (entrance is on Filmore Street; 412-268-2323 emergency only, 412-268-6232 non-emergency). The department’s services include police patrols and call response, criminal investigations, shuttle and escort services (additional information included in the Parking and Transportation section of the handbook below), fixed officer and foot officer patrols, event security, and crime prevention and education programming. Visit the department’s website for additional information about the staff, escort and shuttle, emergency phone locations, crime prevention, lost and found, finger print services, and annual statistic reports.

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.
4.3 Safety Procedures

What follows is a brief summary of Safety Practices and Procedures. All students working in laboratories should have appropriate laboratory training. See the Carnegie Mellon Environmental Health and Safety site for more details. Upon entering a laboratory, students should familiarize themselves with the safety features available in case of emergency. These are the locations of:

- Fire extinguishers, their type and method of operation and fire escape routes;
- Emergency eyewash fountains and safety showers;
- Emergency telephone contact; to report a fire or obtain help in other emergencies call Security, x8-2323.
- Nearest emergency exit.

If the student feels that additional safety equipment is needed, or if the existing equipment is not working properly, the student should talk to the advisor about acquisition or replacement of the safety items. The following safe practices should be observed in the laboratory:

- Students should wear proper eye protection as required by Carnegie Mellon safety rules. Repeated violation may lead to dismissal from the laboratory.
- No eating, drinking, applying cosmetics, or wearing ear buds in the laboratory.
- Students should follow all the laboratory safety procedures as established by the Department or Carnegie Mellon University.

4.3.1 Working Alone

Working in a laboratory alone can be hazardous. When working alone outside the hours of 7 a.m. to 10 p.m., Monday through Friday, the student is recommended to arrange periodic checks with Security (x8-2323). This helps in dealing with emergency experimental situations as well as in discouraging potential assailants.

4.3.2 Operating Machines and Equipment

The student must receive instructions in operating machinery or equipment by a qualified person such as the advisor or senior laboratory technician/researcher. The student should never use a piece of equipment without the permission of the person responsible. Secure hair and loose clothing (ties, sleeves, etc.) when working around moving machinery.

A special problem occurring frequently is that of unidentified chemicals in unmarked containers. Such a situation should be corrected immediately. Graduate students are responsible for the disposal or proper storage of all chemicals they have been using. Each student who has worked in a laboratory must complete a checkout form signed by the advisor before leaving or graduating.

The telephone numbers of the laboratory supervisor and personnel designated as emergency contact, plus any other pertinent information regarding the operation and shutdown of equipment, should be posted inside the laboratory. Equipment for which failures can result in a fire, spill of material, explosion, or flood must be attended at all times or provision made for periodic inspections.

5 KEY OFFICES FOR GRADUATE STUDENT SUPPORT

5.1 Office of the Assistant Vice Provost for Graduate Education

The Office of the Assistant Vice Provost for Graduate Education, AVPGE (grad-ed@cmu.edu), directed by Suzie Laurich-McIntyre, Assistant Vice Provost for Graduate Education, provides central support for graduate students in a number of roles. These include: being an ombudsperson and resource person for graduate students as an informal advisor; resolving formal and informal graduate student appeals; informing and assisting in forming policy and procedures relevant to graduate students; and working with departments on issues related to graduate students and implementation of programs in support of graduate student development.
The Office of the AVPGE often partners with the division of Student Affairs to assist graduate students with their Carnegie Mellon experience. Senior members of the student affairs staff are assigned to each college and are often consulted by the Assistant Vice Provost for Graduate Education and departments on an individual basis to respond to graduate student needs.

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

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

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

5.2 Office of the Dean Student Affairs

The Office of the Dean of Student Affairs provides central leadership of the metacurricular experience at Carnegie Mellon. The offices that fall under the division of Student Affairs led by Dean of Student Affairs, Gina Casalegno, include:

- Career and Professional Development Center
- Counseling & Psychological Services (CAPS)
- Housing & Dining Services
- Orientation & First Year Programs (note: for undergraduate students)
- Office of International Education (OIE)
- Student Activities
- Student Life

Holly Hippensteel, Assistant Dean of Student Affairs, serves as the point person in the division for graduate student resources and concerns. Graduate students will find the enrollment information for Domestic Partner Registration in the Office of the Dean of Student Affairs and on the website. The Office of the Dean of Student Affairs also manages the Emergency Student Loan (ESLs) process. The Emergency Student Loan service is made available through the generous gifts of alumni and friends of the university. The Emergency Student Loan is an interest-free, emergency-based loan repayable within 30 days. Loans are available to enrolled students for academic supplies, medication, food or other expenses not able to be met due to unforeseeable circumstances.

5.3 Assistance for Individuals with Disabilities

Students with disabilities are encouraged to self-identify with Equal Opportunity Services by contacting Larry Powell, 412-268-2013, lpowell@andrew.cmu.edu to access the services available at the university and initiate a request for accommodations.
5.4 **Eberly Center for Teaching Excellence & Educational Innovation**

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

5.5 **Graduate Student Assembly**

The Carnegie Mellon Student Government consists of an Executive Branch and a Legislative Branch. This is the core of traditional student government, as governed by the Student Body Constitution. The Executive Branch serves the entire student body, graduate and undergraduate, and consists of one president and four vice-presidents. The Legislative Branch for graduate students, The Graduate Student Assembly (GSA) passes legislation, allocates student activities funding, and otherwise acts on behalf of all graduate student interests. GSA also plans various social opportunities for graduate students and maintains a website of graduate student resources on and off-campus, [www.cmu.edu/stugov/gsa/resources/index.html](http://www.cmu.edu/stugov/gsa/resources/index.html). Each department has representation on GSA and the department rep(s) is the main avenue of graduate student representation of and information back to the graduate students in the department.

5.6 **Intercultural Communication Center (ICC)**

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

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

Carnegie Mellon hosts international graduate and undergraduate students who come from more than 90 countries. Office of International Education (OIE) is the liaison to the University for all non-immigrant students and scholars. OIE provides many services including: advising on personal, immigration, academic, social and acculturation issues; presenting programs of interest such as international career workshops, tax workshops, and cross-cultural and immigration workshops; supporting international and cultural student groups such as the International Student Union and the International Spouses and Partners Organization; maintaining a resource library that includes information on cultural adjustment, international education and statistics on international students in the United States; posting pertinent information to students through email and the OIE website, and conducting orientation programs.