



# TABLE OF CONTENTS

## Contents

1. Welcome to Mechanical Engineering _____	1
2. University Policies, CMU Statement of Assurance, & CMU Code _____	3
3. Mechanical Engineering Department Structure _____	5
4. The Ph.D. Degree _____	6
5. Advising _____	21
6. Financial Support _____	22
7. Department Policies _____	29
8. Additional University Policies/Protocols _____	32
9. Appendix A: Department Resources _____	41
10. Appendix B: Selected University Resources and The WORD, Student Handbook _____	46
11. Appendix C: Important Information and Resources for International Students _____	54
12. Appendix D: Math Requirement _____	58
13. Appendix E: Requirement Tracking Sheets _____	60
14. Index _____	62

## 1. Welcome to Mechanical Engineering

We thank you for choosing the Mechanical Engineering Department and hope your time here will be both successful and enjoyable.

The Mechanical Engineering Department at Carnegie Mellon University offers an intellectually stimulating, collaborative environment in which to advance your learning as a graduate student. Today's mechanical engineers work across technologies and disciplines to solve some of society's toughest problems. The department answers the need for professional skills with a comprehensive program that provides depth in mechanical engineering fundamentals and breadth in emerging multidisciplinary topics. Academic activities are balanced with hands-on research opportunities that give our graduates the ability to frame complex problems and collaborate widely across organizations.

Our diverse student body currently includes over 300 full-time graduate students, post-doctoral researchers, and part-time students. At the graduate level, the department offers both Master of Science Course Work and Research options, as well as Direct and Advanced Entry Ph.D. degrees.

This handbook describes the Department policies that govern the Ph.D. programs in Mechanical Engineering ("MechE"). It is not an exhaustive list of all applicable policies. College of Engineering (CIT) and University policies supercede Department policies. The handbook provides links, where appropriate, to relevant College or University policies, including [The Word](#) (the student handbook). Information from the Office of the Assistant Vice Provost for Graduate Education, and from the Office of the Dean of Student Affairs and others are included in [Appendix B](#). Students should consult these external resources to familiarize themselves with all policies that apply to Carnegie Mellon University Ph.D. students.

### 1.1 DEPARTMENT PERSONNEL

- Mechanical Engineering Department Head – Allen Robinson  
<http://www.cmu.edu/me/people/allen-robinson.html>  
Assistant – Katherine Tucker – 412-268-3860 (SH 426)
- Head of Graduate Education Committee (GEC) – Prof. Alan McGaughey  
<http://www.cmu.edu/me/people/alan-j-h-mcgaughey.html>
- Head of Ph.D. Subcommittee of GEC – Prof. Jonathan Malen  
<http://www.cmu.edu/me/people/jonathan-a-malen.html>
- Mechanical Engineering Graduate Administrators
  - Chris Hertz, Manager of Academic Programs, 412-268-3175 (SH 404), [chertz@andrew.cmu.edu](mailto:chertz@andrew.cmu.edu)
  - Melissa Brown, Graduate Academic Advisor, 412-268-1562 (SH 407), [mlb2@andrew.cmu.edu](mailto:mlb2@andrew.cmu.edu)

# MECHANICAL ENGINEERING PHD HANDBOOK

- The Graduate Administrators are also able to assist with academic or personal situations that graduate students may not have the resources to resolve. If you have questions or concerns, please schedule an appointment: <https://booknow.appointment-plus.com/1hgky36e/10>. Additionally, students may confer with the university graduate student ombudsperson, Suzie Laurich-McIntyre, [slaurichmcintyre@cmu.edu](mailto:slaurichmcintyre@cmu.edu), on issues of process or other concerns as they navigate conflicts. Suzie Laurich-McIntyre is the Assistant Vice Provost for Graduate Education.
- Manager of Communications: Lisa Kulick, 412-268-5444, [lkulick@andrew.cmu.edu](mailto:lkulick@andrew.cmu.edu)
- Travel & Expense Coordinator: Christopher Sickler, 412-268-2932, [sickler@cmu.edu](mailto:sickler@cmu.edu)
- Faculty: <http://www.cmu.edu/me/people/faculty.html>
- Department Points of Contact: <http://www.cmu.edu/me/people/who-to-call.html>
- Department Directory (Faculty and Staff): <http://www.cmu.edu/me/people/index.html>
- Department location: Scaife Hall 402
- Department phone: 412-268-2500
- Department fax: 412-268-3348

## 1.2 COLLEGE PERSONNEL

- Dean, College of Engineering (CIT) – James H. Garrett Jr.  
[http://engineering.cmu.edu/about/dean/garrett\\_bio.html](http://engineering.cmu.edu/about/dean/garrett_bio.html)
- Assistant – Sue Haslett – 412-268-6196 (SH 110)
- Associate Dean for Graduate and Faculty Affairs – Vijayakumar Bhagavatula  
412-268-2478 or 3026 (SH 110)

## 2. University Policies, CMU Statement of Assurance, & CMU Code

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

- The Word/Student Handbook: [www.cmu.edu/student-affairs/theword//index.html](http://www.cmu.edu/student-affairs/theword//index.html)
- Academic Integrity Website: [www.cmu.edu/academic-integrity](http://www.cmu.edu/academic-integrity)
- University Policies Website: [www.cmu.edu/policies/](http://www.cmu.edu/policies/)
- Graduate Education Website: <http://www.cmu.edu/graduate/policies/index.html>
- Carnegie Institute of Technology (CIT) Website: <http://engineering.cmu.edu/>

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

### 2.1 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/administrative-and-governance/statement-of-assurance.html>.

## 2.2 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>.

## 3. Mechanical Engineering Department Structure

The Department of Mechanical Engineering (“MechE”) is part of Carnegie Mellon University’s College of Engineering, the Carnegie Institute of Technology (“CIT”). The MechE Graduate Education Committee (“GEC”) administers the MechE graduate programs.

### 3.1 GRADUATE EDUCATION COMMITTEE

The GEC and its subcommittees (Ph.D. and M.S.) establish graduate curricula and requirements, policies, and course changes and additions. The GEC coordinates graduate student advising, admission and financial aid decisions, the Ph.D. qualifying exams, and provides major support for the graduate recruitment process.

Graduate student concerns, suggestions, and feedback should be directed to the Graduate Committee Chair through the Graduate Administrator (see [\*Department Personnel\*](#)) or through the Mechanical Engineering Graduate Student Organization (MEGSO).

## 4. The Ph.D. Degree

Specific requirements for attainment of the Ph.D. degree are found in this section of the handbook. The Ph.D. has two primary components: course-work and research. Additional requirements are seminar, the qualifying exam, teaching assistantships, thesis proposal, oral defense, and submission of a written thesis.

Ph.D. students should meet with their faculty advisor and program administrator periodically throughout their matriculation to ensure that they are meeting all of the degree requirements. It is ultimately the student's responsibility to satisfy all of the requirements for graduation. Students should utilize the [requirement tracking sheet\(s\)](#) provided by the graduate program administrator to track progress.

The Ph.D. degree prepares students for research careers in academia or industry. Students typically complete the Ph.D. degree requirements in four to five years, but the duration will vary depending on research progress and the specific field of study.

Early in the program, students focus on course-work that enhances their fundamental knowledge of mechanical engineering and their chosen research domain. Department of Mechanical Engineering courses have the numerical designation of 24-####. To learn about course offerings, visit the [Schedule of Classes](#) and the list of MechE [courses](#).

Within one year of enrollment, students must take the qualifying exam, which is an oral exam that tests research skills and fundamentals in a core mechanical engineering subject area. Students also gain educational experience through teaching assistantships. Student research forms the core of the Ph.D. program. Research involves active student-directed inquiry into an engineering problem that leads to the discovery and dissemination of new knowledge. The research culminates in a written thesis and an oral defense.

### 4.1 OBJECTIVES OF THE PH.D. DEGREE

- To gain expertise in a chosen engineering-science domain
- To conduct world-class research in a specific engineering-science domain
- To discover and disseminate new knowledge in a specific engineering-science domain
- To learn outside of the classroom
- To conduct independent research
- To present complex ideas to a technical audience
- To develop engineering-science knowledge



# MECHANICAL ENGINEERING PHD HANDBOOK

Students achieve these objectives through a combination of course work, examinations, teaching, and research.

## 4.2 ENTRY DISTINCTIONS

Course requirements vary based on a student's prior educational background (whether students enter the program with a B.S. or M.S. in Mechanical Engineering or closely related field). Slight variants of the rules exist for dual Ph.D. programs administered in conjunction with other departments at Carnegie Mellon or other institutions. These rules and variations are outlined below.

### 4.2.1 ADVANCED ENTRY PH.D.

The Advanced Entry Ph.D. is for students who have previously attained an M.S. in Mechanical Engineering or a closely related field. Advanced entry students have reduced course requirements compared to Direct Ph.D. students. Students entering with a degree other than Mechanical Engineering may need to take additional course work, and should consult with the GEC and graduate program administrator prior to registration.

### 4.2.2 DIRECT ENTRY PH.D.

The Direct Entry Ph.D. is for students entering the program with a B.S. in Mechanical Engineering or a closely related field. These students have more course requirements compared to Advanced Entry Ph.D. students. Students entering with a degree other than Mechanical Engineering may need to take additional course work, and should consult with the GEC and graduate program administrator prior to registration.

#### Integrated Master's/Ph.D. Requirements

An integrated program is available to MechE Ph.D. students who also wish to complete a master's degree in mechanical engineering. Ph.D. students may complete an M.S. degree on the way to Ph.D. by completing the MS-Course (MSC) requirements. Interested students must alert the Graduate Program Administrator prior to their thesis defense. Once all M.S. requirements are completed, students may be certified with an M.S. degree. Courses and research used to complete M.S. requirements will be double-counted towards the Ph.D. degree.

See the M.S. Handbook for MSC requirements.

# MECHANICAL ENGINEERING PHD HANDBOOK

Coursework	<p><b>For Advanced Entry Ph.D.:</b></p> <ul style="list-style-type: none"> <li>- Minimum 60 units (minimum 36 units must be MechE (24-6## or 24-7##) including the math requirement listed below).</li> </ul> <p><b>For Direct Entry Ph.D.:</b></p> <ul style="list-style-type: none"> <li>- Minimum 96 units (minimum 48 units must be MechE (24-6## or 24-7##) including the math requirement listed below).</li> </ul> <p><b>For all Ph.D.:</b></p> <ul style="list-style-type: none"> <li>- One math course from the approved list (see <a href="#">Appendix D</a>)</li> <li>- Technical electives (additional MechE courses (24-###) or courses from an <a href="#">approved department</a>) are used to complete the remaining course units</li> <li>- All courses must be graduate-level courses (600 or 700 level)</li> <li>- May include Supervised Reading (24-793 up to 3 units) taken as a supplement for a 9-unit course. A letter grade will be given and factor in the QPA. May be used one-time only.</li> <li>- May not include Supervised Reading (24-793) taken as pass/fail independent study, Thesis Research (24-797), or Ph.D. Internship in Teaching Counterpart (24-795)</li> <li>- Cumulative grade point average must be 3.0 or higher at graduation (See <a href="#">QPA Calculation</a> section of handbook)</li> </ul>
Research Units	<ul style="list-style-type: none"> <li>- Must register for Thesis Research every semester (24-797) – variable units</li> </ul>
Additional Requirements	<ul style="list-style-type: none"> <li>- Two oral qualifying exams (Research and Subject) taken within one year of entry</li> <li>- Two Teaching Assistantship (TA) assignments (12 units of 24-795 section A for each assignment)</li> <li>- Thesis Proposal (typically 2-3 years after entry)</li> <li>- Formal public thesis defense</li> <li>- Comprehensive and professionally written thesis (approved by the advisor/thesis committee and submitted to the department prior to graduation)</li> </ul>
Departmental Seminar	<ul style="list-style-type: none"> <li>- Required every semester for full-time students</li> </ul>
Responsible Conduct of Research (RCR) Training	<ul style="list-style-type: none"> <li>- Mandatory for all CIT students conducting research (see <a href="#">policy</a>)</li> </ul>
Max units per semester	<p>Students are limited to a maximum of 54 total units per semester. No exceptions.</p>

## 4.3 PH.D. DEGREE REQUIREMENTS

4.3.1 The Ph.D. requirements are summarized in the table below:

### 4.3.2 Coursework

Courses are a primary focus of the early part of a student's Ph.D. program. Courses form a foundation for the student's research. There are two objectives of the coursework: (1) to gain broad knowledge of mechanical engineering fundamentals and (2) to gain in-depth understanding of an area of engineering closely related to the student's research. The course work requirements should be viewed as a minimum; students are encouraged to take additional courses to expand the breadth and depth of their knowledge.

Students must discuss the selection of courses with their faculty advisor. Courses must fit into the student's overall educational plan for their MechE degree. Students do not receive credit for independent study, supervised reading, or research course numbers taken outside of MechE.

### 4.3.3 Policy on Double Counting Courses

No courses used to fulfill requirements of a previously completed degree shall count towards any MechE degree requirement. Likewise, no courses used for any MechE degree shall double count towards another degree. No courses may double count for Ph.D. except in the following cases:

- Students who have previously received their M.S. degree in the MechE department at CMU.
  - In such cases, the course used to fulfill the math requirement for the M.S. degree may also satisfy the math requirement for Ph.D.
- Integrated M.S./Ph.D. – all courses taken as a Ph.D. student may double-count towards M.S. degree.
- NTU/KAIST dual Ph.D. students may double-count 2 courses (18-24 units) as well as 1 TA assignment in Mechanical Engineering at CMU.

### 4.3.4 Policy for Courses Taken Outside of the Department/College

The technical electives component of the Ph.D. requirements creates flexibility for students to tailor their coursework towards their technical interests. Ph.D. students may take courses and receive credit from the following departments (graduate level courses only – ##-6## or ##-7##): all departments in the College of Engineering (Biomedical Engineering [42-###], Chemical Engineering [06-###], CIT Interdisciplinary Courses [39-###], Civil and Environmental Engineering [12-###], Electrical and Computer Engineering [18-###], Engineering and Public Policy [19-###], Materials Science and Engineering [27-###]); all departments in the School of Computer Science (Computer Science (15-###), Human Computer Interaction (05-###), Information Systems: School of IS and Management (95-###), Institute for Software

# MECHANICAL ENGINEERING PHD HANDBOOK

Research (08-###), Language Technologies Institute (11-###), Machine Learning (10-###), Robotics (16-###); all departments in the Mellon College of Science (Biology (03-###), Chemistry (09-###), Mathematical Sciences (21-###), and Physics (33-###)); and Statistics (36-###).

Students may petition the GEC to count undergrad courses or courses from outside of the pre-approved departments. See *Petition/Waiver Procedures*.

## 4.3.5 Research

The student's research experience forms the core of the MechE Ph.D. programs. Research involves active, student-directed inquiry into an engineering problem that leads to the creation and dissemination of new knowledge. Students learn how to conduct research under the close supervision of faculty advisor(s). The research experience is overseen by a Ph.D. committee.

There are multiple goals for conducting research: (1) to become an expert and to develop new knowledge in a specific area of engineering, (2) to learn the general skills needed to conduct independent research, and (3) to discover and disseminate new knowledge.

Conducting research requires combining knowledge gained in the classroom with the ability to read the scientific literature, identify critical knowledge gaps, structure complex problems, formulate and test hypotheses, analyze and interpret data, and present and discuss technical results. Engineering research also requires significant experimental, computational, and analytical skills. A student learns these core skills as he/she pursues a research problem. Many of these skills are not learned in the classroom, but in the laboratory, library and conference room as the student actively interacts with faculty, other students, and researchers.

Independent, non-classroom-based learning and problem solving is a core aspect of the Ph.D. degree. Upon completion of the dissertation, a Ph.D. student should be an international expert in a technical area. Dissemination of findings is an essential part of the degree program. This typically includes multiple publications in peer-reviewed, archival journals or peer-reviewed, archival conference proceedings as well as multiple presentations (oral or poster) of research at national or international technical conferences.

## 4.3.6 Research-Related Resources for Ph.D. Students

To learn about faculty research areas visit:

<http://www.cmu.edu/me/research/index.html>, and <https://www.cmu.edu/me/people/faculty.html>.

- Resources and Regulations Governing Research at Carnegie Mellon:
  - Environmental Health and Safety (EHS): <http://www.cmu.edu/ehs/>
  - Office of Sponsored Research: <http://www.cmu.edu/osp/>
  - Office of Research Integrity & Compliance: <http://www.cmu.edu/research-compliance/index.html>
- Intellectual Property Policy: <http://www.cmu.edu/policies/documents/IntellProp.html>

# MECHANICAL ENGINEERING PHD HANDBOOK

- Policy on Restricted Research: <http://www.cmu.edu/policies/research/restricted-research.html>
- Human Subjects in Research Policy: <http://www.cmu.edu/research-compliance/human-subject-research/>

## 4.3.7 Supervised Reading/Independent Study

Students enrolled in Supervised Reading and/or research must enroll in the appropriate MechE course number (24-793 for Supervised Reading and 24-797 for research). This applies even if the student is working with a faculty member outside of MechE.

Supervised Reading (24-793), also known as Independent Study, is a course designed to provide students with an opportunity for intensive study of a subject that is either unavailable or insufficiently covered in regular course work. Supervised Reading is not intended to substitute for existing courses or research, but to provide the opportunity for a specialized educational experience. A pass/fail grade will be assigned upon completion. Students must identify a faculty member willing to oversee the supervised reading and then enroll in the MechE Supervised Reading “course” number (24-793). Supervised reading /independent study “course” numbers offered by other departments do not count towards MechE degree requirements.

To receive credit for research, students must enroll in the MechE research “course” number (24-797 Thesis Research). Students shall not receive credit for research conducted under other department research “course” numbers.

Students arranging Supervised Reading must:

- Obtain approval from their faculty advisor.
- Draft a contract with the faculty instructor that describes in detail the course and its requirements. A copy of the contract must be given to the graduate administrator.

Supervised Reading may also be used to supplement an existing lower-unit course. For example, a 9 unit course can be supplemented with 3 units of Supervised Reading to create twelve units of study. In this case, the supervisor must be the teaching faculty of the lower-unit course, and the Supervised Reading units must be taken concurrently with the course being supplemented. A letter grade (A, B, C, etc.) will be assigned upon completion.

Supervised Reading may not take the place of course units or research units (24-797).

## 4.3.8 Qualifying Exams

Students must demonstrate their preparation to conduct research through two oral qualifying exams – a research exam and a subject exam. The exams require students to clearly present technical concepts, structure an engineering problem, respond to questions, and demonstrate engineering intuition.

# MECHANICAL ENGINEERING PHD HANDBOOK

- Research Exam:
  - Oral exam before a faculty committee
  - Tests knowledge of research methods and understanding of research concepts required for conducting Ph.D. research
  - Report and oral presentation are based on research performed in the first year
- Subject Exam:
  - Oral exam before a faculty committee
  - Tests graduate-level understanding of undergraduate mechanical engineering fundamentals
  - Exams are offered in seven topic areas:
    - Controls, Design, Fluids, Heat Transfer, Solids, Thermodynamics, and Vibrations
- Quals are offered in September (Fall semester) and January (Spring semester)
- Quals must be taken within 1 year of entering the Ph.D. program
- Students who do not pass either the research or the subject exam must retake the unsuccessful exam at the next offering (typically at the beginning of the next semester). Students who pass one exam but not the other, need only retake the unsuccessful exam.
- Students who do not pass a second time will not be permitted to continue in the Ph.D. program. An M.S. degree (Course-work option) may be obtained if all requirements have been met.

Additional information regarding the qualifying exams (including a pdf with more in-depth details as well as practice subject tests) is available from the Graduate Program Administrator.

#### 4.3.9 CMU Mechanical Engineering Teaching Intern (TA Assignments)

Participation in the teaching mission of the department is a requirement of the Ph.D. program. It provides a valuable learning and mentoring experience for the student. All Ph.D. students must serve as a teaching assistant (TA) twice during their tenure in the Ph.D program.

To fulfill the teaching requirements students must register for and pass 24-795 *Ph.D. Internship in Teaching Counterpoint* in each semester that they serve as a TA. (*Course description:* A teaching assignment under the guidance of a faculty member for intermediate or terminal-level doctoral candidates. Typical activities include preparing and teaching recitations, preparing and teaching laboratory sessions, holding office hours, grading and preparation of quizzes, problem sets and other assignments, and assisting instructor with other activities associated with teaching a course. 24-795 is 12 units and offered in Fall and Spring.

(P/F). All non-native English speakers must conform to the university regulation on the TA language requirements).

Students typically serve as a teaching intern one semester in their second and third years of the Ph.D. Circumstances may arise that warrant earlier or later TA assignments. The graduate administrator will contact students who are being considered for a TA assignment. Students may be assigned as a TA for any course, but each student's background and interests are considered in making assignments. The GEC will consider requests regarding a particular semester or course a student requests to TA. However, the ability to grant these requests depends upon department teaching needs.

#### 4.3.10 TA and Non-Native English Speakers (the ITA Test)

The Commonwealth of Pennsylvania and Carnegie Mellon University have minimum requirements in English communication that must be met in order for a student to serve as a teaching assistant. Therefore, all students who are non-native English speakers must take and pass a language proficiency test—the International Teaching Assistant (ITA) test administered through the ICC (<http://www.cmu.edu/icc/testing/ITA/index.shtml>).

Students must achieve a score of Restricted I or Pass on the ITA test in order to serve as a TA. See here for the ICC description of ITA results: <http://www.cmu.edu/icc/testing/ITA/ITAscoring.shtml>.

Requirements for Non-Native English Speakers:

- Attend an ICC Language Check-In immediately upon arrival to CMU : <http://www.cmu.edu/icc/language/training/checkin.shtml>.
- Achieve score of Restricted I or Pass on the ITA test in order to receive a TA assignment.

Ph.D. students must complete two TA assignments as a requirement for their degree. Students who receive a score of Restricted II or Not Qualified will not be permitted to TA without improving their score to Restricted I (or better). Students who are unsuccessful in multiple attempts to improve their ITA score may petition the GEC to obtain alternate TA arrangements. The following must be demonstrated:

- The student has made significant efforts to improve English language proficiency including:
  - 25-35 hours per semester of documented ESL-related study. This ESL study must be performed in every semester the student is enrolled until a score of Restricted I or Pass is achieved on the ITA test. ESL Resources include workshops at the ICC or locally in Pittsburgh:  
<http://www.cmu.edu/icc/language/training/workshops.shtml#classes>  
<http://www.cmu.edu/icc/family/index.shtml>
- At least one additional attempt at the ITA test to achieve Restricted I status (must receive ICC approval to retake the test)
- If the petition is granted, the student must attend a minimum of 28 hours of ICC language classes concurrent with their TA assignment

Regardless of ITA test score, the MechE department strongly encourages all non-native speakers of English to take additional workshops and seminars to help improve their English language skills. This is especially important if you are interested in employment in the United States or in a university setting. The ICC offers many resources to help improve language (<http://www.cmu.edu/icc/language/training/index.shtml>) and we strongly suggest taking advantage of these services while at CMU.

#### 4.3.11 Thesis Proposal and Defense Committee

In addition to the thesis advisor, each Ph.D. student must develop a Ph.D. thesis committee. The Ph.D. committee is developed in consultation with the Ph.D. advisor and oversees the student's research experience. Through the proposal, annual committee meetings, and the defense, the committee monitors the student's progress. At each of these meetings the student presents his or her research and responds to the committee members' questions.

The committee provides an outside perspective on the student's research, helps the student to structure their research, and identifies research opportunities. The committee is responsible for approving both the student's research proposal and the final dissertation.

The thesis committee must include:

- At least 4 members
- At least 2 CMU MechE faculty members (full or courtesy)
- At least 1 member outside MechE

The precise timing of the thesis proposal meeting is at the discretion of the advisor and student. Most Ph.D. students form a thesis committee and conduct the proposal between years two and three of entering the Ph.D. program. The thesis proposal meeting is an important milestone marking the end of the initial phase of research.

Ten days prior to the thesis proposal meeting, the student must provide the committee members with a written prospectus for the thesis research that includes a literature review motivating the problem, a description of preliminary results, and a description of the proposed research plan. At the thesis proposal meeting the student will give an oral presentation of the proposed thesis research, and is questioned by the committee on the proposed research plan and related subjects.

After a thesis proposal meeting has been held and committee recommendations are considered, the student's advisor submits a letter or email to the Graduate Program Administrator and the Graduate Committee Chair indicating the date of the thesis proposal, the members of the thesis committee, and the outcome of the proposal exam (including follow up if the exam was not successful).

After the formal proposal, it is strongly recommended that thesis committee meetings be held approximately once per year until the final thesis defense.



## 4.3.12 Thesis Defense and Thesis Submission:

**Students should make an appointment with the Graduate Program Administrator the semester BEFORE they are planning to defend.** The Graduate Program Administrator will review the degree requirements with the student to identify any requirements that remain to be completed. **Students have the responsibility of ensuring that their records are correct and up to date.**

Students should provide a complete, draft copy of their Ph.D. thesis to their committee at least two weeks before the defense. The exact timing is at the discretion of the committee and the student's advisor, but two weeks is typical. This allows the committee time to review the document before the public defense.

Prior to the public defense, students will receive a signature card from the graduate administrator. This card should be brought to the defense so that it can be signed by the committee. Immediately after the defense, the signed card must be returned to the graduate program administrator.

After the public defense, the committee will typically request revisions to the thesis document. Students should make these changes in consultation with their faculty advisor. The faculty advisor will verify that the thesis revisions are made. When the changes are complete, the following must be provided to the graduate administrator:

- One electronic copy of the dissertation (on CD or USB) for the CMU library
- Three unbound copies of the dissertation (may be double-sided and in color if necessary)
- At least one signature page signed by the faculty advisor.
- One extra copy of the title page
- One extra copy of the abstract
- Library submission checklist
- ProQuest/UMI agreements (if applicable)
- Survey of Earned Doctorates (if applicable)
- CPDC graduation career survey

After the student submits all of the proper documentation, the graduate administrator will submit the thesis to the Department Head and then to the CIT Dean. After the thesis has been signed and approved, the student will be certified with the Ph.D. degree.

Copies of the thesis will be sent to the bindery and distributed as follows: one copy for Department records, one copy for the student, and one copy for the faculty advisor(s). Additional bound copies can be purchased at the student's expense. (The student must also provide extra unbound copies of the document.)

# MECHANICAL ENGINEERING PHD HANDBOOK

There are strict deadlines that must be followed in regard to the final submission of the dissertation. Please check with the graduate administrator to obtain the dates pertaining to August, December, or May graduation.

## 4.3.13 Seminar

The MechE Department offers a seminar speaker series in the Fall and Spring semesters. Distinguished speakers are invited from both inside and outside the CMU community to discuss topical issues in engineering and research. There are typically 7 or 8 seminar speakers each semester. All full-time Ph.D. students are required to attend seminar each semester. To register, please use 24-791 section A for Fall, or 24-792 section A for Spring.

Seminar is worth 0 (zero) units and students will be granted an S-grade (Satisfactory) or an N-grade (Non-Pass) based on attendance. There are no other academic requirements (no tests or papers) associated with seminar. Students registered for seminar must attend all seminars offered that semester. (Seminars offered during university break periods are considered optional.) To earn credit for attending, students sign the attendance sheet circulated during each seminar. Failure to sign the attendance sheet will result in a missed seminar for that week.

Students who miss a seminar may attend a maximum of two make-up seminars per semester. Make-up seminars may be attended in one of the following pre-approved departments: all engineering departments, machine learning, robotics, human computer interaction, computer science, and the natural sciences – biology, chemistry, physics, and math. MechE may also advertise pre-approved make-up seminars throughout the semester. To receive credit for attending a make-up seminar, please send a brief 1-2 paragraph summary of the make-up seminar attended in an email to your academic advisor. Your academic advisor will add the summary to your file and make sure you receive credit.

Seminar waivers may be granted for students in extenuating circumstances: examples include conflicts with another CMU course, university-related travel (such as for research or for a conference), or for medical reasons. Please alert your academic advisor or the Graduate Program Administrator if you believe you qualify for a seminar waiver for any reason.

## 4.3.14 CITI Research compliance course

The following is a MANDATORY REQUIREMENT of all MechE Ph.D. students:

In an effort to increase awareness and compliance of research ethics, the CIT Dean's Office requires all personnel (students, faculty, post-docs) involved in research activities pass the Collaborative Institutional Training Initiative (CITI) research ethics training course. This is a mandatory requirement of all MechE Masters & Ph.D. students, faculty and post-docs. You need only pass the course once. Students must complete the course by the end of the first month of their first semester.

To complete the CITI on-line education course go to CITI's website (<https://www.citiprogram.org/>). Create an account and select Carnegie Mellon University as your "organization." Once your registration is

# MECHANICAL ENGINEERING PHD HANDBOOK

complete, you will be directed to a list of courses. Please choose the following course under Responsible Conduct of Research (RCR):

- Physical Science Responsible Conduct of Research Course

Some helpful hints on navigating through the course:

- For the question: “Do you anticipate requesting CMU/CEU credits for the course?” Answer: No
- For “Institutional Email Address” please enter your Andrew email. For “Department” please enter “Mechanical Engineering.”
- Please complete “The Integrity Assurance Statement” before beginning the course.
- After submitting the integrity statement, you should be directed into the research ethics course itself. Please read the material, watch the videos and answer the subsequent test questions. **A score of 80% is needed to pass.**

The course may take a few hours to complete but can be done over a period of time. You may save your test at any time and return to it later. When you complete the course, CITI will e-mail your completion record to you. In order to receive credit for passing the course, please forward your completion email to the MechE receptionist.

You may take the course as many times as necessary until you pass. Again, passing the course is a mandatory requirement of all MechE grad students, faculty and post-docs. No exceptions!

#### 4.3.15 Residency Requirement

A minimum of one year of residency is required for the Ph.D. degree. Residency is defined as registering full-time (at least 36 units) in two consecutive semesters.

## 4.4 OTHER PH.D. PROGRAMS

The department also offers joint Ph.D. programs with other departments at Carnegie Mellon and with other universities.

#### 4.4.1 Joint Ph.D. degree with Engineering and Public Policy (EPP)

The Mechanical Engineering Department currently has an active joint Ph.D. with Engineering and Public Policy (EPP). In addition to the standard MechE and EPP Ph.D. requirements, students pursuing the joint degree must also:

- Satisfy all the requirements for Carnegie Mellon’s Ph.D. Degree in Mechanical Engineering (either Advanced Entry or Direct Entry as appropriate), including passing all examinations and meeting all course and research requirements
- Pass both department qualifying exams

# MECHANICAL ENGINEERING PHD HANDBOOK

- Form one thesis defense committee that satisfies the requirements of both departments

## 4.4.2 Dual Ph.D. degree with Nanyang Technological University (NTU)

The Mechanical Engineering Department currently has an active dual Ph.D. program with the College of Engineering at [Nanyang Technological University \(NTU\)](#), Singapore. To attain a dual degree through this program, students must:

- Apply to both Carnegie Mellon's MechE Ph.D. program and the College of Engineering at NTU. If the application deadlines do not coincide, students will need to apply by the earliest deadline.
- Be admitted to both institutions independently.
- Be supervised by two research co-advisors, one from Carnegie Mellon (MechE) and one from NTU.
- Spend two academic years minimum in residence at Carnegie Mellon and two academic years minimum in residence at NTU.
- Satisfy all the requirements for Carnegie Mellon's Ph.D. Degree in Mechanical Engineering (either Advanced Entry or Direct Entry as appropriate), including passing all examinations and meeting all course and research requirements. Students in a dual Ph.D program are responsible for contacting the partner institution to become familiar with the degree requirements at the partner institution.
- The thesis defense committee will consist of at least 1 member from NTU, 2 from CMU (MechE department), and 1 neutral member jointly sourced.
- Candidates shall be allowed to schedule the oral defense only if all members of the examination panel recommend "Minor Revision" or better to the final thesis. If a "Major Revision" is recommended, the candidate shall be given up to 3 months to make amendments before resubmission.
- If the oral defense takes place at NTU, the Chairman will be from NTU, who is usually not an examiner. Thus the panel will have at least 5 members: Chairman (NTU) x 1, NTU x 1, CMU x 2 (via teleconference), External neutral x 1 (via teleconference and jointly sourced by both NTU and CMU supervisors).
- If the oral defense takes place at CMU, CMU will appoint the Chairman. In this case, the Chairman can be one of CMU panel members. But NTU requires that the CMU Thesis Advisor shall NOT be the Chairman. Thus the panel will have at least 4 members: NTU x 1 (via teleconference), CMU x 2 (1 can be appointed as Chairman as dual role), External neutral x 1 (jointly sourced by both NTU and CMU supervisors). NTU does not allow the NTU Thesis Supervisor(s) to be a member of the panel.
- Upon the successful completion of all the requirements of each program, Ph.D. degrees from both Carnegie Mellon and NTU will be awarded.

# MECHANICAL ENGINEERING PHD HANDBOOK

## 4.4.3 Dual Ph.D. degree with Korea Advanced Institute of Science & Technology (KAIST)

The Mechanical Engineering Department currently has an active dual Ph.D. program with the School of Mechanical Engineering at [Korea Advanced Institute of Science & Technology \(KAIST\)](#), South Korea. To attain a dual degree through this program, students must:

- Apply to both Carnegie Mellon's MechE Ph.D. program and the School of Mechanical Engineering at KAIST. If the application deadlines do not coincide, students will need to apply by the earliest deadline.
- Be admitted to both institutions independently.
- Be supervised by two research co-advisors, one from Carnegie Mellon (MechE) and one from KAIST.
- Spend two academic years minimum in residence at Carnegie Mellon and two academic years minimum in residence at KAIST.
- Satisfy all the requirements for Carnegie Mellon's Ph.D. Degree in Mechanical Engineering (either Advanced Entry or Direct Entry as appropriate), including passing all examinations and meeting all course and research requirements. Students in a dual Ph.D program are responsible for contacting the partner institution to become familiar with the degree requirements at the partner institution.
- Upon the successful completion of all the requirements of each program, Ph.D. degrees from both Carnegie Mellon and KAIST will be awarded.

## 4.4.4 Ph.D. partnership with A\*STAR

The department currently collaborates with the [Agency for Science, Technology and Research \(A\\*STAR\)](#), on the A\*STAR-CMU Partnership Ph.D. Programme (ACMP). This collaboration focuses on the areas of high performance computing and manufacturing, two important areas of research for both Carnegie Mellon and A\*STAR. Memorandums of understanding were signed between the department and the two relevant A\*STAR institutes, [Institute of High Performance Computing \(IHPC\)](#) and [Singapore Institute of Manufacturing Technology \(SIMTech\)](#).

ACMP is a four-year scholarship comprising approximately two years of Ph.D. studies at Carnegie Mellon, and two years at a relevant A\*STAR Research Institute (RI) in Singapore. Ph.D. research training will be carried out under the joint supervision of a CMU Professor and a senior member of an A\*STAR RI. Successful students will be awarded a Ph.D. degree by CMU. Specifics of the program are detailed on the A\*STAR [ACMP webpage](#).

## 4.4.5 Rules that govern all dual programs with partner institutions:

- Students in dual Ph.D. programs will have two faculty advisors – one in CMU MechE and one in the partner institution. While the CMU faculty member will chair the CMU Ph.D. Committee, the faculty

# MECHANICAL ENGINEERING PHD HANDBOOK

member of the partner institution will be a member of the Ph.D. Committee at CMU and can serve as chair for the Ph.D. committee at the partner institution. The same person cannot act as the committee chair at both institutions.

- Students may transfer or double-count up to two courses (18-24 units) for use at both the CMU Ph.D. and the partner institution. Transferred courses cannot count toward another degree received by the student, other than the Ph.D. degree awarded by the partner institution. All other rules governing course transfers apply:  
[http://www.cit.cmu.edu/current\\_students/graduates/policies.html](http://www.cit.cmu.edu/current_students/graduates/policies.html)).
- Students transferring two courses or equivalent from the partner institution will not be allowed to transfer any additional units from any other institution.
- Students in a dual Ph.D. program must serve as teaching intern twice. For students in a dual Ph.D. program with an external partner institution, at least one of these teaching internships must be conducted in the Department of Mechanical Engineering at Carnegie Mellon. Upon approval of the Graduate Education Committee (GEC), the Department will allow the transfer of credit for a teaching internship performed at the external partner institution to satisfy the second TA assignment. (Does not apply to joint Ph.D. with EPP.)

## 5. Advising

### 5.1 STUDENT-PROFESSOR RELATIONSHIP AND ADVISING

Every admitted student in the Ph.D. program conducts research with a specific MechE (full time or courtesy) faculty member who serves as the student's faculty advisor. The faculty advisor guides the student through the entire Ph.D. process including course selection, research, and selection of the research committee. This faculty member serves as the chair of the thesis committee and often provides a Research Assistantship to the student.

Advising is monitored by the Graduate Program Administrator and the GEC. While Ph.D. students are responsible for ensuring that they are satisfying the requirements of their degree, the faculty advisor is responsible for providing feedback and guidance to ensure that research progress is made. All students must have a faculty advisor to maintain academic standing in the PhD program.

- **Role of the Faculty Advisor:** The faculty advisor's role is to help guide the student through successful completion of the Ph.D defense and thesis submission.
- **Role of the Graduate Administrator:** The graduate administrator's role is to help guide the student through the administrative aspects of the program from enrollment through graduation.
- **Role of the Student:** All students are responsible for ensuring that they satisfy the requirements of their degree.
- **How and When Advisors are Assigned/Selected:** All Ph.D. students are admitted with a faculty advisor. The name of the advisor is provided in the admission letter and agreed upon prior to enrollment.
- **Procedure for changing advisors:** In rare situations, students may wish to change faculty advisors. A student wishing to consider this possibility is encouraged to consult the graduate program administrator, the Ph.D. subcommittee chair, the GEC chair, or the department head.

## 6. Financial Support

### 6.1 DEPARTMENTAL FINANCIAL SUPPORT

#### 6.1.1 Research Assistantships

In the majority of cases, a paid Research Assistantship (RA) will be offered to Ph.D. students. RA's include a tuition fellowship, stipend, and the technology fee, and are typically provided by research grants and contracts that are funded by government agencies, private industries, and consortia. Ph.D. research assistants are expected to conduct appropriate research under the direction and guidance of their research advisor. A standard R.A. provides up to five years of support contingent upon maintaining good academic standing and making satisfactory progress towards degree completion.

The RA is based upon the assumption that a student does not have funding available from another scholarship or fellowship (e.g. NSF GRFP, GEM, NDSEG, etc.). MechE encourages students to apply for these prestigious external awards. If you are successful, please alert the Manager of Academic Programs. The external fellowship will be applied to the academic expenses before any departmental financial support. In the event that a student is awarded an external fellowship and it does not fully cover the standard RA, the faculty advisor will supplement the external fellowship up to the standard RA. Supplementary funds for up to five years are contingent upon maintaining good academic standing and making satisfactory progress towards degree completion.

Ph.D. students who have not been admitted with an RA (rare) are encouraged to apply for external funding opportunities. Please review a list of opportunities available on-line: <http://www.cmu.edu/fso>.

#### 6.1.2 Student Financial Responsibilities

Ph.D. students are responsible for some of the educational costs of the degree. These costs include health insurance, books and supplies, and the activity and transportation fees. Carnegie Mellon's current fee structure can be found at the [Enrollment Services website](#).

#### 6.1.3 Employment in Addition to the Research Assistantship

Students who are receiving an RA either from their advisor or from the department are not permitted to obtain additional employment during the academic year or during the summer. Students who have a paid Summer internship must forfeit the RA during the internship if the internship pays the same or more than the standard RA. If the internship pays less than the standard RA, and the student is able to conduct additional research work related to their project, then the faculty advisor may supplement the stipend up to the standard RA. Volunteer positions are allowable with advisor permission.



# MECHANICAL ENGINEERING PHD HANDBOOK

## 6.1.4 External Employment for Self-Supported Ph.D.

Self-supported Ph.D. students (i.e. those who receive no MechE Research Assistantship) may have outside employment. F-1 visa regulations stipulate that international students who have outside employment must maintain full time registration (at least 36 units) and may only work a maximum of 20 hours per week.

## 6.1.5 Travel/Conference Funding

Presenting research findings at conferences is an important part of the Ph.D. experience. Travel funding is provided by the Ph.D. faculty advisor through research grants. Students can also seek funding from the university through the Graduate Student Assembly (GSA) and the Office of the Assistant Vice Provost for Graduate Education. Information regarding the university application process for conference funding may be found here: <http://www.cmu.edu/graduate/professional-development/conference-funding/index.html>.

In the event that conference funding is not available from the faculty advisor or from the university, Ph.D. students may petition the MechE department for a one-time grant of \$500. The petition should be presented in an email to the Chair of the Ph.D. Subcommittee of the Graduate Education Committee (GEC) as well as the Graduate Program Administrator. The petition should include the name and description of the conference, the student's role at the conference (presenter, collaborator, etc.), and how the money will be allocated (travel expenses, accommodation, meals, etc.). Please also include a statement from the faculty advisor that no funding is available from the faculty advisor or from the university. Department funding will be provided as a reimbursement for expenses paid. Receipts must be provided upon return from the conference.

## 6.1.6 Research Funding

Funding for materials and supplies, equipment, and other items needed to conduct the research is provided by the faculty advisor. GuSH Research Funding is an additional source of small research grant funds provided by the Graduate Student Assembly (GSA) and the Provost's Office and managed by the Office of the Assistant Vice Provost for Graduate Education. Students can find more information about the application process and deadlines on the Graduate Student Funding website: <http://www.cmu.edu/graduate/financial-assistance/index.html>.

## 6.2 POLICIES GOVERNING FUNDING FOR PH.D. STUDENTS ADMITTED WITH A RESEARCH ASSISTANTSHIP

Ph.D. students admitted to the Department with an RA are admitted to work with a specific faculty member who provides the financial support from his/her funds (grants, contracts, gifts, internal funds, etc.). The admission letter states that the RA will continue for "up to 5 years ..., contingent upon you maintaining good academic standing and making satisfactory progress toward completing the degree." Therefore, there is one contingency with respect to continued funding of the Research Assistantship – academic progress.













# MECHANICAL ENGINEERING PHD HANDBOOK

## 7.3 DEPARTMENT REGISTRATION PROCESS AND PROCEDURES

For instructions, go to the [HUB Registration Website](#) and work through the four easy steps for registration. You will be asked to authenticate your identity with your Andrew ID and password.

Use the [Schedule of Classes](#) to help prepare for registration. This link provides information on courses offered in the current, previous, and upcoming semesters.

For questions regarding registration please contact the graduate administrator:

<https://booknow.appointment-plus.com/1hgky36e/10>.

## 7.4 COURSE RELATED POLICIES/PROTOCOLS

Please see the [Degree Requirements](#) section for course requirements specific to the Ph.D. Please note that course availability changes each academic year. For a current list of available courses, visit the [Schedule of Classes](#).

### 7.4.1 Petition/Waiver Procedures

A student wishing to petition the GEC for special permission or special circumstances related to their degree, or for a waiver of degree requirements, must send a formal letter of petition via email to the Head of the GEC. The letter should outline the reason for the request, and provide any relevant supporting information (course descriptions, syllabi, etc.). Please CC your faculty advisor and the department administrator on the request.

Please note: The GEC does NOT accept petitions to count non 24-### courses towards the MechE course unit requirements. Only courses offered from the MechE department or cross-listed within MechE (i.e. courses that start with 24-###) may count toward the MechE course-unit requirement.

### 7.4.2 Policy for Incompletes

If a student receives an "Incomplete" grade on their transcript, they must work with the course instructor to make up the work necessary to receive a letter grade for the class. All "incomplete" grades are submitted with a default grade. The default grade is automatically processed as the final grade if the instructor does not supply the University with an alternate grade (via the "Change of Grade" form) by the last day of class the following academic semester (this does not include summer). For appeals, please see the [Summary of Graduate Student Appeal and Grievance Procedures](#) section of this handbook.

### 7.4.3 Policy for Withdrawal Grade ('W' Grade) in a Course

If a student drops a class after the course drop deadline, but before the last day of the class, they will receive a "W" (withdrawal) grade for the course. Students may also be withdrawn from a course for failing to provide adequate attendance. "W" grades do not factor into the student's QPA, and cannot be removed from the transcript.





## 8. Additional University Policies/Protocols

### 8.1 GRADES AND GRADING

The Mechanical Engineering Department follows the CIT and CMU policy for grading.

- For information on the CIT grading policy and QPA requirements, Please see this link: [http://engineering.cmu.edu/current\\_students/graduates/policies.html](http://engineering.cmu.edu/current_students/graduates/policies.html).
- For more information on CMU grading policies, please see this link: <http://www.cmu.edu/policies/documents/Grades.html>.

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

Research work may be given an S (Satisfactory) grade on a semester-by-semester basis, but a letter grade (A, A-, B+, B, B-, C+, C, C-, D+, D, or R) must be given in the final semester. The units with an S-grade are counted toward degree requirements but are not included in computing the average QPA.

For College of Engineering students, course work or research units with a grade of C- or lower are not acceptable toward graduate degree requirements. Grades of C- and below will remain on the CMU transcript and count toward the student's *university* QPA. Departmental QPA (the QPA used toward MechE degree requirements) will not be affected.

Courses taken as Audit or Pass/Fail may not be used toward graduation requirements for degree certification.

#### 8.1.1 Policy on Retaking a Course

Students may retake any course where they have received a grade of C- or lower in an attempt to have the course count toward degree requirements. If a student receives a grade of C or above for the retake, the course may then be counted towards degree requirements. Only the grade of C or above will factor into the student's MechE QPA. Courses may only be retaken once.

#### 8.1.2 QPA

The MechE Ph.D. requires a QPA of 3.0 or above for successful academic standing and for graduation. QPA calculations follow the [CIT policy](#). For Ph.D., all factorable units (courses and research taken for a letter grade) shall be used to compute the QPA. If a student's QPA drops below 3.0, they are considered to be on [probation](#). No student with a QPA below 3.0 at the time of graduation will have their degree certified or be permitted to graduate.

**QPA Calculation:** The QPA is calculated only with courses, supervised reading (24-793), or research (24-797) taken for a letter grade and used to satisfy degree requirements. Audit courses, withdrawn courses, or

# MECHANICAL ENGINEERING PHD HANDBOOK

courses or research taken as audit or pass/fail are not included in the QPA calculation. "A" is the highest grade possible. A+ does not exist.

A = 4.0

A- = 3.67

B+ = 3.33

B = 3.0

B- = 2.67

C+ = 2.33

C = 2.0

## 8.2 PRACTICUM IN MECHANICAL ENGINEERING (FOR INTERNSHIPS)

Ph.D. students completing an internship or co-op may register for 3 units of 24-799 Practicum in Mechanical Engineering and those units may be used toward the degree requirements (but not as course units). The internship or co-op must be integral to the student's curriculum. Students must provide the Graduate Program Administrator with an offer letter from the hiring company that includes the title of the internship or co-op and the job duties to be performed. The faculty advisor and/or Ph.D. Subcommittee Chair will determine if the internship or co-op is integral to the student's curriculum based on the offer letter from the hiring company. Additional information may be required if the offer letter does not clearly reflect how the position is integral to the student's curriculum. Once registered for the course, students must submit a written report (1-2 pages) to the faculty advisor and the Graduate Program Administrator detailing the nature of the job duties and how their experience relates to their MechE degree. The report should be signed by the student's internship supervisor. Students will receive a letter grade (A, B, C, etc.) for 24-799 based on the written report, and the grade will factor into the student's QPA.

While most internship and co-op experiences happen during the summer semester, it is also possible to have an internship or co-op experience during the regular academic year (Fall or Spring). The policy stated above still applies.

International Students may be required to secure work authorization and should consult with the Office of International Education to determine their work authorization needs and options.

## 8.3 AUDIT AND PASS/FAIL COURSES

CMU students are permitted to take classes for no credit via the audit or pass/fail process. Students must register for the course and submit the appropriate form with signatures to the HUB. Both audit and





# MECHANICAL ENGINEERING PHD HANDBOOK

For more information please see <http://www.cmu.edu/hr/eos/disability/index.html>. Students with disabilities are encouraged to self-identify with Equal Opportunity Services by contacting Larry Powell, 412-268-2013, [lpowell@andrew.cmu.edu](mailto:lpowell@andrew.cmu.edu) to access the services available at the university and initiate a request for accommodations.

## 8.7 INTELLECTUAL PROPERTY

Students enrolled in the Department of Mechanical Engineering are expected to adhere to the Intellectual Property guidelines as set forth by the university:

<http://www.cmu.edu/policies/documents/IntellProp.html>.

## 8.8 ACADEMIC CONFLICT

Graduate students are expected to discuss any concerns or grievances initially with members of their academic departments, including their academic advisor and Department Head, as appropriate. If a student wishes, the Associate Dean for Academic Affairs of the College of Engineering is available for consultation. All such discussions will be considered confidential at the request of the student.

If resolution of an academic grievance or concern cannot be obtained within the academic department, a graduate student may file a formal appeal of academic actions to the Associate Dean for Academic Affairs of the college. In accordance with the Carnegie Mellon Student Handbook, such appeals will ordinarily be heard and decided by the CIT (Engineering) College Council.

Written materials and findings of such appeal processes are considered confidential for all parties involved.

If a resolution cannot be reached by this process, an appeal may be made to the Provost at the request of either the student or the college.

## 8.9 SUMMARY OF GRADUATE STUDENT APPEAL AND GRIEVANCE PROCEDURES

Graduate students will find the Summary of Graduate Student Appeal and Grievance Procedures on the Graduate Education Resource webpage:

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

This document summarizes processes available to graduate students who seek review of academic and non-academic issues. Generally, graduate students are expected to seek informal resolution of all concerns within the applicable department, unit or program before invoking formal processes.

When an informal resolution cannot be reached, however, a graduate student who seeks further review of the matter is to follow the formal procedures outlined here. These appeal and grievance procedures shall apply to students in all graduate programs of the University. Students should refer to the department











## 9. Appendix A: Department Resources

### 9.1 FACILITIES AND TECHNICAL SERVICES

The Mechanical Engineering department provides a variety of facilities to support our students, faculty, and affiliates.

#### 9.1.1 Office Assignments

Every Ph.D. student is assigned a desk, typically in a shared office suite. These assignments are made by the Graduate Program Administrator. Keys for offices require a \$5 deposit as well as permission from the research advisor and Graduate Program Administrator. Please consult the MechE receptionist (SH 402) for the Key Form.

After students are assigned an office space, it is their responsibility to keep the area clean and free of obstructions. Furniture should remain in the configuration that it is found; specifically in common areas.

Because other students generally share office space, courtesy must be practiced at all times. These are work areas and therefore, large personal belongings, such as bicycles, are not permitted in the office. There are bicycle racks located in front of Scaife and Hamerschlag Halls.

Students may occasionally be asked to switch desks, but generally office moves are kept to a minimum. Any changes to office assignments must be pre-approved and documented. Questions or concerns regarding office assignments should be directed to the Graduate Program Administrator.

#### 9.1.2 Department Keys

Mechanical Engineering Department Building/Lab/Room keys are disbursed to enrolled graduate students with authorization of a faculty or staff member. Keys are recalled upon job termination, before graduation, or at the request of the authorizing faculty/staff member as appropriate. A \$5 cash deposit is required on all keys issued to graduate and post doctorates. The deposit is forfeited on keys lost or not returned. Please see the MechE Department Office (Scaife Hall 402) for a Key Request Form (the form must be signed by the appropriate faculty member if for a lab space) and pay the cash deposit to obtain a key.

#### 9.1.3 Computer Cluster

The ME department maintains the Shimp Collaborative Computer Center on C level (C101) in Hamerschlag Hall. The space may be configured to create a small group study area. 45 Windows workstations are equipped with a variety of [engineering software packages](#). These facilities are for use only by MechE students and faculty. Students can gain access to the MechE cluster using their CMU ID card. If your ID card access is not working and you are a current MechE undergraduate or graduate student please contact the MechE Main Office: 412-268-2500 (please provide your CMU ID card number when you call).









## 10. Appendix B: Selected University Resources and The WORD, Student Handbook

### 10.1 KEY OFFICES FOR GRADUATE STUDENT SUPPORT

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

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

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

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

The Office of the AVPGE offers a robust schedule of professional development opportunities. Some are geared towards a specific population (master's students, Ph.D. 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 university. 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)





# MECHANICAL ENGINEERING PHD HANDBOOK

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).

## 10.1.5 Graduate Student Assembly

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

The Carnegie Mellon Student Government consists of an Executive Branch and a Legislative Branch. This is the core of traditional student government, as governed by the Student Body Constitution. The Executive Branch serves the entire student body, graduate and undergraduate, and consists of one president and four vice-presidents. The Legislative Branch for graduate students, The Graduate Student Assembly (GSA) passes legislation, allocates student activities funding, 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/](http://www.cmu.edu/stugov/gsa/Resources/). 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.

## 10.1.6 Office of International Education (OIE)

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

[Jump to Appendix C](#)

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.

## 10.1.7 Intercultural Communication Center (ICC)

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

[Jump to Appendix C](#)

The Intercultural Communication Center (ICC) is a support service offering both credit and non-credit classes, workshops, and individual appointments designed to equip nonnative English speakers (international students as well as international students who attended high school or college 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.

# MECHANICAL ENGINEERING PHD HANDBOOK

## 10.1.8 Global Communication Center (GCC)

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

[Jump to Appendix C](#)

The Global Communication Center (GCC) provides free communication instruction and support to students and faculty through one-on-one tutoring, campus workshops and classroom support. GCC staff offer research-based strategies to assist students on written, oral, or visual projects to help them communicate more effectively. They work with all students at all levels of English language ability.

## 10.1.9 Consumer Information

Carnegie Mellon University suggests that all current and prospective students be informed consumers. Please see this link for detailed consumer information: <http://www.cmu.edu/hub/consumer/index.html>.

## 10.2 KEY OFFICES FOR ACADEMIC & RESEARCH SUPPORT

### 10.2.1 Computing and Information Resources

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

Computing Services provides a comprehensive computing environment at Carnegie Mellon. Graduate students should seek Computing Services for information and assistance with your Andrew account, network access, computing off-campus, campus licensed software, email, calendar, mobile devices, computer security, cluster services and printing.

The Carnegie Mellon Computing Policy establishes guidelines and expectations for the use of computing, telephone and information resources on campus. The policy is supported by a number of guidelines graduate students should know. The policy and guidelines are available at:

[www.cmu.edu/computing/guideline/index.html](http://www.cmu.edu/computing/guideline/index.html).

### 10.2.2 Research at CMU

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

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

### 10.2.3 Office of Research Integrity & Compliance

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









## 11. Appendix C: Important Information and Resources for International Students

### 11.1 POLICIES TO NOTE:

International students should take special note of the following policies:

- [Part-time status](#)
- [ITA Test](#)
- [Internships/Co-Ops](#)
- [ABS vs. ABD](#) (and potential visa restrictions): In some circumstances, it may be necessary to complete the Ph.D. research outside of the main CMU campus in Pittsburgh. All students who are no longer residents in Pittsburgh must change their status to ABS (all but dissertation in absentia). International students in ABS status must terminate their SEVIS record and forfeit OPT.

### 11.2 RESOURCES TO NOTE:

International students should take special note of the following campus resources:

- [Office of International Education \(OIE\)](#)
- [Intercultural Communication Center \(ICC\)](#)
- [Global Communication Center \(GCC\)](#)

### 11.3 ESL RESOURCES

#### 11.3.1 CMU – On Campus Program

##### **ICC Language Program**

<http://www.cmu.edu/icc/languagetraining/index.shtml>

The Intercultural Communication Center offers classes, workshops, and seminars to develop various aspects of academic fluency (e.g., pronunciation, fluency, grammar usage, presentation skills, academic writing, and cross-cultural understanding). They also offer **self-paced work** videos and websites to supplement ICC classwork.

#### 11.3.2 Academic ESL Programs

##### **University of Pittsburgh - English Language Institute (ELI)**

<http://www.eli.pitt.edu/>



# MECHANICAL ENGINEERING PHD HANDBOOK

Offers intensive fee-based programs for serious adults who want to improve their English for academic, professional or personal reasons. Options include classes in General English, English Pronunciation, TOEFL preparation, and evening courses for part-time students. University of Pittsburgh scholarships are available for eligible full-time faculty and research associates.

## **Duquesne University - English as a Second Language Program (ESLP)**

<http://www.duq.edu/esl>

An academic support program that offers foreign students semi-intensive and intensive English for Academic Purposes (EAP). The ESL Program offers Duquesne's international foreign national students semi-intensive and intensive English for academic purposes.

## **Chatham University - English Language Program**

[www.chatham.edu/elp](http://www.chatham.edu/elp)

Chatham University offers instruction in English to various levels of ESL students and provides a "bridge" through sheltered college classes to students who are striving to attain a high level of academic English level proficiency.

## **LaRoche College - English as a Second Language (ESL) Program**

<http://www.laroche.edu/esl/>

The English As a Second Language (ESL) Program at La Roche College is designed to provide proficiency-based instruction in English for degree and non-degree seeking students, to promote students' participation in their chosen field, and to support adjustment to and participation in the life of the college and the community.

## **Pointe Park University - ELS Language Center**

<http://www.els.edu/en/ELSCenters/Detail?locid=PIT>

The Language Center offers three month-long programs based on the intensity of instruction desired.

### 11.3.3 Private Tutors

Contact the ICC for a list of local ESL instructors available for private work (language training and editing). Phone: 412-268-4979.

### 11.3.4 Free Programs

## **Carnegie Library of Pittsburgh – ESL Programs**

<http://www.carnegielibrary.org/services/for-language-learners/>

The Carnegie Library of Pittsburgh offers a variety of resources for non-native English speakers.

# MECHANICAL ENGINEERING PHD HANDBOOK

## **Greater Pittsburgh Literacy Council**

<http://www.gplc.org/our-programs.cfm>

Offers English classes at beginning, intermediate, and advanced levels.

## **Goodwill Literacy Initiative**

<http://www.nationalliteracydirectory.org/goodwill-literacy-initiative>

This program offers beginning to advanced classes, class size limited to 6-10 students. In addition to an individualized study plan, a dedicated staff of tutors will assist students with college or job applications, cover letters, interviewing, recommendation letters, and other types of printed materials. We also offer computer laboratories with free email and Internet access. Students are encouraged to visit our Student Support Specialist, who assists our students in finding other student services such as housing, visas, health insurance, academic advising, and many others.

## **International Women's Association of Pittsburgh (IWAP)**

<http://iwap-home.blogspot.com/>

The primary purpose of the group is to develop understanding and appreciation among peoples from different nations and cultures, and to assist international women in enjoying their stay in Pittsburgh and in the United States. They offer informal free conversation classes in English as a Second Language on Monday mornings (10 to 11:30 a.m.) Church of the Ascension. They also display in their website a complete list of English programs in Pittsburgh.

## **Allegheny Intermediate Unit (aiu3) – Adult ESL Program**

<http://www.aiu3.net/Level3.aspx?id=310>

The AIU's Adult ESL program seeks to help any non-English speaking person to learn American English. Each year, the program serves nearly 1,000 learners from more than 40 countries.

## **Pittsburgh Regional International Student Ministries-PRISM**

<http://prismphg.org/>

Designed especially for spouses of visiting students and scholars, introductory and intermediate instruction is offered on Bellefield Presbyterian Church, every Monday in the afternoons. No registration needed, \$1 donation each week, child care available (\$2 per child).

### 11.3.5 Intensive Regional Programs

## **Washington and Jefferson College English Language Institute (ELI)**

<http://www.washjeff.edu/english-language-institute>

# MECHANICAL ENGINEERING PHD HANDBOOK

The English Language Institute at Washington and Jefferson College offers an intensive English for academic purposes program that prepares students both academically and culturally for undergraduate study in the United States.

## **West Virginia University - Intensive English Program (IEP)**

<http://iep.wvu.edu/>

The Intensive English Program in the Department of Foreign Languages at West Virginia University has become a well-established program for international students needing to improve their English proficiency prior to entering an academic course of study.

11.3.6 Online ESL Resources

## **Activities for ESL Students**

<http://a4esl.org/>

This website offers grammar and vocabulary practice thorough quizzes and crossword puzzles.

## **Learn To Speak English**

<http://www.mylanguageexchange.com/Learn/English.asp>

Find **pen-pals**, practice written conversation using **text chat**, and practice speaking using **voice chat**.

## **Sounds of English**

<http://www.soundsofenglish.org/>

This website offers pronunciation instruction and activities.

## **Learn English Vocabulary**

<http://www.vocabulary.co.il/>

Play games to practice English vocabulary.

## 12. Appendix D: Math Requirement

### 12.1 LIST OF COURSES THAT SATISFY THE MECHE MATH REQUIREMENT:

#### **Chemical Engineering**

- 06-713 Mathematical Techniques in Chemical Engineering

#### **Civil and Environmental Engineering**

- 12-704 Probability and Estimation Methods for Engineering Systems
- 12-726/19-726 Mathematical Modeling of Environmental Quality Systems
- 12-755/24-755 Finite Elemental Method in Mechanics I
- 12-756 Finite Elemental Method in Mechanics II
- 12-758 Boundary Element Methods in Mechanics
- 12-759 Optimization in Mechanics

#### **Electrical and Computer Engineering**

- 18-660 Numerical Methods for Engineering Design and Optimization
- 18-751 Applied Stochastic Processes
- 18-771/24-771 Linear Systems

#### **Engineering and Public Policy**

- 19-726/12-726 Mathematical Modeling of Environmental Quality Systems

#### **Mechanical Engineering**

- 24-701 Mathematical Techniques in Mechanical Engineering
- 24-703 Numerical Methods
- 24-718 Computational Fluid Dynamics
- 24-755/12-755 Finite Elemental Method in Mechanics I
- 24-771/18-771 Linear Systems
- 24-785 Engineering Optimization

#### 12.1.1 Other Miscellaneous Courses that Can be Used to Satisfy the MechE Math Requirement (added 5/9/02)

#### **Robotics Institute**

- 16-811 Mathematical Fundamentals for Robotics

#### **University of Pittsburgh**

Math courses at University of Pittsburgh may also count. However, the Graduate Education Committee (GEC) must approve the Pitt course as being analogous to a Carnegie Mellon course listed above.

#### **Mechanism for Adding Courses to the Math List:**

Students may petition the GEC to add a CIT course to the list. Please provide a statement from the instructor (course description or syllabus) as to the level of math content in the course. The math content must be 50% or more.







## 14. Index

1. Welcome to Mechanical Engineering _____	1
1.1 Department Personnel _____	1
1.2 College Personnel _____	2
2. University Policies, CMU Statement of Assurance, & CMU Code _____	3
2.1 Carnegie Mellon University Statement of Assurance _____	3
2.2 The Carnegie Mellon Code _____	4
3. Mechanical Engineering Department Structure _____	5
3.1 Graduate Education Committee _____	5
4. The Ph.D. Degree _____	6
4.1 Objectives of the Ph.D. degree _____	6
4.2 Entry Distinctions _____	7
4.2.1 Advanced entry ph.d. _____	7
4.2.2 Direct Entry ph.d. _____	7
Integrated Master's/Ph.D. Requirements _____	7
4.3 Ph.D. Degree requirements _____	9
4.3.1 The Ph.D. requirements are summarized in the table below: _____	9
4.3.2 Coursework _____	9
4.3.3 Policy on Double Counting Courses _____	9
4.3.4 Policy for Courses Taken Outside of the Department/College _____	9
4.3.5 Research _____	10
4.3.6 Research-Related Resources for Ph.D. Students _____	10
4.3.7 Supervised Reading/Independent Study _____	11
4.3.8 Qualifying Exams _____	11
4.3.9 CMU Mechanical Engineering Teaching Intern (TA Assignments) _____	12
4.3.10 TA and Non-Native English Speakers (the ITA Test) _____	13
4.3.11 Thesis Proposal and Defense Committee _____	14
4.3.12 Thesis Defense and Thesis Submission: _____	15
4.3.13 Seminar _____	16



# MECHANICAL ENGINEERING PHD HANDBOOK

4.3.14 CITI Research compliance course	16
4.3.15 Residency Requirement	17
4.4 Other Ph.D. programs	17
4.4.1 Joint Ph.D. degree with Engineering and Public Policy (EPP)	17
4.4.2 Dual Ph.D. degree with Nanyang Technological University (NTU)	18
4.4.3 Dual Ph.D. degree with Korea Advanced Institute of Science & Technology (KAIST)	19
4.4.4 Ph.D. partnership with A*STAR	19
4.4.5 Rules that govern all dual programs with partner institutions:	19
5. Advising	21
5.1 Student-Professor Relationship and Advising	21
6. Financial Support	22
6.1 Departmental Financial Support	22
6.1.1 Research Assistantships	22
6.1.2 Student Financial Responsibilities	22
6.1.3 Employment in Addition to the Research Assistantship	22
6.1.4 External Employment for Self-Supported Ph.D.	23
6.1.5 Travel/Conference Funding	23
6.1.6 Research Funding	23
6.2 Policies Governing Funding for ph.d. students admitted with a Research Assistantship	23
6.2.1 Inadequate Academic Performance	24
6.2.2 Withdrawal of Research Assistantship (RA)	24
6.2.3 Switch from Ph.D. to M.S.	25
6.3 University Financial Aid	25
6.4 External Funding	25
6.4.1 U.S. Department of Education Resources	25
6.4.2 Additional Loan Resources	25
Grad PLUS	25
Private Loans	26
6.4.3 Other Resources	26
6.4.4 Additional Sources of Financial Aid for International Students	27

# MECHANICAL ENGINEERING PHD HANDBOOK

Grants and scholarships _____	27
Institute of International Education (IIE) _____	27
Ford Foundation International Fellowship Program (IFP) _____	27
Links _____	28
7. Department Policies _____	29
7.1 Academic Integrity _____	29
7.2 Full & Part Time Status _____	29
7.3 Department Registration Process and Procedures _____	30
7.4 Course Related Policies/Protocols _____	30
7.4.1 Petition/Waiver Procedures _____	30
7.4.2 Policy for Incompletes _____	30
7.4.3 Policy for Withdrawal Grade ('W' Grade) in a Course _____	30
7.4.4 Policy for Make-Up Exams _____	31
7.5 Academic Probation _____	31
7.6 Graduate Certification Process and Degree Title _____	31
8. Additional University Policies/Protocols _____	32
8.1 Grades and Grading _____	32
8.1.1 Policy on Retaking a Course _____	32
8.1.2 QPA _____	32
8.2 Practicum in Mechanical Engineering (for internships) _____	33
8.3 audit and pass/fail courses _____	33
8.4 Pittsburgh Council on Higher Education (PCHE) courses _____	34
8.5 Transfer Courses _____	34
8.5.1 Transfer Policy (for courses taken at a university other than CMU excluding courses taken through PCHE) _____	34
8.6 Assistance for Individuals with Disabilities _____	35
8.7 Intellectual Property _____	36
8.8 Academic Conflict _____	36
8.9 Summary of Graduate Student Appeal and Grievance Procedures _____	36
8.9.1 Resources for Exceptional or Challenging Situations _____	37

# MECHANICAL ENGINEERING PHD HANDBOOK

8.9.2 Steps in Grievance procedure _____	37
8.10 Safeguarding Educational Equity: Policy Against Sexual Harassment and Sexual Assault _____	38
8.11 Maternity Accommodation Protocol _____	38
8.12 “Grandfather” Policy _____	38
8.13 Vacations and Time-Off _____	39
8.13.1 University Holidays _____	39
8.14 Statute of Limitations _____	39
8.15 withdrawal from program & Leave of Absence _____	40
8.16 Enrollment verification _____	40
8.17 Graduation _____	40
9. Appendix A: Department Resources _____	41
9.1 Facilities and Technical Services _____	41
9.1.1 Office Assignments _____	41
9.1.2 Department Keys _____	41
9.1.3 Computer Cluster _____	41
9.1.4 Computing Services _____	42
9.1.5 Laboratories _____	42
9.1.6 ME Machine Shop _____	42
9.1.7 Shared Facilities _____	42
9.1.8 Mailroom _____	42
9.1.9 Copy Machines _____	43
9.2 Purchasing and Reimbursement Policies and Procedures _____	43
9.2.1 Purchasing _____	43
9.2.2 Reimbursements _____	43
9.3 Press & Media Relations _____	43
9.4 Department/College/University Brands & Logos _____	44
9.5 Student Organizations _____	44
9.5.1 MEGSO _____	44
9.5.2 GSA _____	44
10. Appendix B: Selected University Resources and The WORD, Student Handbook _____	46

# MECHANICAL ENGINEERING PHD HANDBOOK

10.1 Key Offices for Graduate Student Support	46
10.1.1 Office of the Assistant Vice Provost for Graduate Education	46
10.1.2 Office of the Dean of Student Affairs	47
10.1.3 Assistance for Individuals with Disabilities	47
10.1.4 Eberly Center for Teaching Excellence & Educational Innovation	47
10.1.5 Graduate Student Assembly	48
10.1.6 Office of International Education (OIE)	48
10.1.7 Intercultural Communication Center (ICC)	48
10.1.8 Global Communication Center (GCC)	49
10.1.9 Consumer Information	49
10.2 Key Offices for Academic & Research Support	49
10.2.1 Computing and Information Resources	49
10.2.2 Research at CMU	49
10.2.3 Office of Research Integrity & Compliance	49
10.3 Key Offices for Health, Wellness & Safety	50
10.3.1 Counseling & Psychological Services	50
10.3.2 Health Services	50
10.3.3 University Police	50
10.3.4 The WORD	51
11. Appendix C: Important Information and Resources for International Students	54
11.1 policies to note:	54
11.2 Resources to note:	54
11.3 ESL Resources	54
11.3.1 CMU – On Campus Program	54
11.3.2 Academic ESL Programs	54
11.3.3 Private Tutors	55
11.3.4 Free Programs	55
11.3.5 Intensive Regional Programs	56
11.3.6 Online ESL Resources	57
12. Appendix D: Math Requirement	58

# MECHANICAL ENGINEERING PHD HANDBOOK

12.1 List of courses that Satisfy the MechE Math Requirement:	58
12.1.1 Other Miscellaneous Courses that Can be Used to Satisfy the MechE Math Requirement (added 5/9/02)	58
13. Appendix E: Requirement Tracking Sheets	60
13.1 Advanced Entry Ph.D. Tracking Sheet	60
13.2 Direct Ph.D. Tracking Sheet	61
14. Index	62