

# **Mechanical Engineering Graduate Student Handbook**

**Academic Year 2021-2022**

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## ***Special Considerations for 2021-2022: Covid-19***

At the time of this writing, Penn State is planning for a full on-campus learning environment for Fall 2021. Some University, Graduate School, College, and Department policies and procedures may evolve over the course of the 2021-2022 academic year as the situation develops. Such changes may supersede the information that is provided in this document. Students are encouraged to monitor regularly the information that is posted by the University at <https://virusinfo.psu.edu/> and by the Graduate School at <https://gradschool.psu.edu/covid19/>, and to contact the Graduate Programs Office in case of questions.

# **Section I – General Information**

## **I.1 GRADUATE PROGRAMS OFFICE**

The Graduate Programs Office for Mechanical Engineering (ME) is located in 127 Reber Building. The office is supervised by the Associate Department Head for Graduate Programs, Dr. Dan Haworth, and Administrative Support Assistant Ashley Ammerman. The office is open during normal business hours on Mondays through Fridays; any changes in hours will be posted on the office door. Students can call the office at 814-865-1345, or email us at [grad@me.psu.edu](mailto:grad@me.psu.edu), and we will respond as quickly as possible.

General functions of the Graduate Programs Office include:

- 1) Assist students with administrative questions, documents and submitting theses and dissertations;
- 2) Prepare material for consideration and action by the department graduate faculty or Associate Department Head for Graduate Programs;
- 3) Recruit the highest quality graduate students;
- 4) Review applications for admission to graduate study; and
- 5) Administer the Ph.D. Qualifying Examination.

The Graduate Programs Office is guided and assisted in these duties by several faculty committees including the Seminars and Graduate Policy Committee, the Graduate Admissions Committee, the Graduate Student Recruiting and Support Committee and the Ph.D. Qualifying Exam Committees. Committee members are appointed by the Department Head, Professor Mary Frecker.

## **I.2 ID CARDS**

Every resident Penn State graduate student will need a Penn State id+ card. Information about how to get your card can be found at <https://idcard.psu.edu/getting-your-id-card>. You will need to present appropriate forms of identification to get your id+ card, and there is no charge for your first card.

## **I.3 PSU EMAIL**

Every Penn State graduate student will need a Penn State access account and email address. The Graduate Programs Office uses email to notify students of various announcements, events, etc. All graduate students are expected to use their Penn State email account for all correspondence regarding academics. If you choose to use an account other than the one provided by the University, you are responsible for all information contained in your Penn State account. Please see the Information Technology (IT) website for more information, at <https://it.psu.edu/>.

## **I.4 MAIL HANDLING**

Incoming graduate student mail will be placed in an alphabetized unit found inside of 127 Reber Building. Please check your mail regularly. Mail will not be held indefinitely. The faculty and staff mailroom is located opposite Room 224 on the second floor of Reber Building. First-class mail and inter-office mail for faculty and staff are sent from, or picked up in, the mailroom. The default mailing address for graduate students is 127 Reber Building.

Do not use a department mailing address to receive personal items. The department is not responsible for loss or theft of any personal mail delivered for you to a department address.

## **I.5 PARKING**

Every employee or student must have a parking permit to park on campus. Individuals enrolled in classes at Penn State are classified as students, and can obtain student parking permits through the Parking Office. Please refer to policies and online registration procedures at <http://www.transportation.psu.edu/>.

Parking registration must be completed online, and all permits are sold on a first-come, first-served basis.

## **I.6 OFFICES, KEYS, TELEPHONES, SUPPLIES, AND COPIES**

*OFFICES* - Students on teaching assistantships will be provided access to space so that they can carry out their responsibilities as teaching assistants. Students on research assistantships will be provided desk space by their research adviser.

*KEYS* - Keys are individually numbered and assigned to each person. If you terminate your graduate studies or graduate, keys must be returned to the ME Business Office in 132 Reber Building. Access to Reber Building is gained by the use of the PSU student ID card.

*PURCHASE OF EQUIPMENT AND SUPPLY ITEMS* - Listed below is a brief overview. We stress that you ask before ordering anything.

School supplies and books are personal expenses, and may not be charged to any departmental budget, teaching or research. Teaching assistants in need of supplies from the supply closet should stop by 127 Reber Building for assistance. Research assistants should see their faculty adviser for advice on how to obtain office supplies, if needed; the supply closet does not stock items for use by research assistants. For ordering laboratory supplies, equipment items, etc., there are several different procedures, depending on the type of item, vendor, and price range. Before placing any order, check with your supervising faculty member or the appropriate staff assistant. If you order something on your own with the intent of eventually charging a University budget and violate University policy, you may be personally liable for the purchase price. Take time to review the procedures with someone who knows the system before you order, and you will avoid complications.

*COPY MACHINES* – Copy machines are in various locations in Reber Building and in other buildings occupied by ME faculty and graduate students. Your graduate research adviser can provide authorization to access these copiers. If you are using these services for "non-

personal" University-related work, ask your faculty supervisor about how to pay for them before you have the work done.

### **I.7 TRAVEL REIMBURSEMENT**

A student who participates in a conference or workshop may be reimbursed for travel expenses, if the student's adviser wishes to do so. The appropriate staff assistant or the Graduate Programs Office can provide you with the necessary reimbursement paperwork. If you make travel arrangements on your own with the intent of eventually charging a University budget and violate University policy, you may be personally liable for travel costs. Take time to review the procedures with someone who knows the system before you travel, and you will avoid complications.

### **I.8 COMPUTER AND IT RESOURCES**

ME students have access to various computer resources. Information will be forthcoming on the department web site. IT support is available at [support@me.psu.edu](mailto:support@me.psu.edu).

ME IT Contact: Christopher Hirsh, IT Consultant, 201C Reber Building; Phone: 814-865-8267;  
Email: [cdh5049@psu.edu](mailto:cdh5049@psu.edu)

## Section II – Administrative Policies and Procedures

### II.1 REPORTING POLICIES, PROCEDURES AND RESOURCES

All members of the Penn State community are expected to remain mindful of their individual commitment to Penn State's core values of [Integrity, Respect, Responsibility, Discovery, Excellence and Community](#) by helping to keep the University a safe and ethical institution. In addition, as members of this community, everyone should be responsible stewards of University funds, whether generated from state, federal, student, or other sources. The University does not condone wrongful conduct by any member of the Penn State community, no matter what position he or she may hold. Penn State University encourages the reporting of misconduct: ***If you see something, say something.*** If you report misconduct, be assured that the University will protect you from retaliation. See [AD67](#) or contact the [Office of Ethics & Compliance](#) for more information. The following resources are available for faculty, staff, students, and others.

#### TO MAKE A REPORT

A summary of types of misconduct and how to report is available at <http://reporting.psu.edu>.

If at any point you are unsure where to report a non-emergency, you may contact the Office of Ethics and Compliance Hotline 24/7 at 800-560-1637 or <http://hotline.psu.edu>.

#### **Crime or Emergency Situation**

- Contact the campus police at 814-863-1111.
- In an emergency, dial **911**.

#### **Alcohol and Drugs**

Penn State has established a [Responsible Action Protocol](#) in response to the University Park Undergraduate Association's campaign for a medical amnesty policy. Effective January 2018, the Responsible Action Protocol was updated and now reflects the following:

- A student who acts responsibly by notifying the appropriate authorities (e.g., calling 911, alerting a resident assistant, contacting police) AND meets one or more of the following criteria typically will not face University conduct action for his or her own use or possession of alcohol or drugs. However, the student will be required to attend an approved alcohol or drug education program, such as BASICS or the Marijuana Intervention Program (MIP); the fee will be waived. When the student's behavior involves other Code of Conduct violations (e.g., vandalism, assault, furnishing to minors) the additional behavior may be subject to conduct action. If a student exhibits a pattern of problematic behavior with alcohol or drugs, that student may be subject to conduct action.
- The criteria which invoke the Protocol are:
  - A student seeks medical assistance *for himself or herself* when experiencing an alcohol or drug overdose or related problems
  - A student seeks medical assistance *for a peer* suffering from an alcohol or drug overdose or related problems
  - A student suffering from an alcohol or drug overdose or related problems, *for whom another student seeks assistance* will also not be subject to conduct action for alcohol violations.

### **Suspected Ethical or Policy Violations**

This includes fraud, theft, conflict of interest, abusive or intimidating behavior, retaliation, athletics integrity or NCAA compliance.

- Report employee misconduct to your supervisor or [HR Strategic Partner](#).
- Report student misconduct to the [Office of Student Conduct](#) or call 814-863-0342.
- Use the Penn State Hotline at 800-560-1637 or <http://hotline.psu.edu>. Both are anonymous and are available 24/7.

### **Child Abuse, Including Child Sexual Abuse**

- Contact the Pennsylvania Child Welfare Services "ChildLine" at 800-932-0313 or <https://www.compass.state.pa.us/cwis>.
- If the child is in immediate danger, dial **911** first.
- You must also email [AD72@psu.edu](mailto:AD72@psu.edu) communicating that a report has been made. For more information on AD72 (Reporting Suspected Child Abuse), see <https://guru.psu.edu/policies/AD72.html>.
- Further details can be found in the "Building a Safe Penn State: Reporting Child Abuse" training available on the Learning Resource Network at <http://lrn.psu.edu>.

### **Behavioral Threat**

- Contact the Behavioral Threat Management Team at 814-863-BTMT (2868) or <http://btmt.psu.edu/>.

### **Bias, Discrimination, or Harassment**

- To report behavior *by an employee*, contact the Affirmative Action Office at 814-863-0471.
- Visit the Report Bias website at <http://equity.psu.edu/reportbias> (for student reporting only)
- Acts of intolerance by students may be reported to the [Office of Student Conduct](#) at 814-863-0342.

### **Sexual Harassment and Other Forms of Sexual Misconduct\***

To make a report to the University

- Contact the University's Title IX Coordinator at 814-867-0099, or [titleix@psu.edu](mailto:titleix@psu.edu).
- To file an online report, visit the Office of Sexual Misconduct Prevention and Response's website at <http://titleix.psu.edu/filing-a-report/>.
- To file an anonymous report, the Penn State Hotline is available 24/7 at 800-560-1637 or <http://hotline.psu.edu>. Both are anonymous, and are available 24/7.

\*Additional information and resources available in relation to incidents of sexual harassment and/or misconduct (including a campus-specific list of victim support services and confidential reporting options) can be found at <http://titleix.psu.edu/>.

To file a discrimination or harassment complaint outside of the University

- Call the Office for Civil Rights (Philadelphia Office) at 215-656-8541 or email [OCR.Philadelphia@ed.gov](mailto:OCR.Philadelphia@ed.gov).
- Call the Equal Employment Opportunity Commission (Philadelphia District Office) at 800-669-4000.
- Call the Pennsylvania Human Relations Commission (Harrisburg Regional Office) at 717-787-9780.

## Student Misconduct

- Contact the Office of Student Conduct at 814-863-0342 or <http://studentaffairs.psu.edu/conduct>, or report online at [https://pennstate.qualtrics.com/jfe/form/SV\\_8qYxyWYciWERPGL](https://pennstate.qualtrics.com/jfe/form/SV_8qYxyWYciWERPGL).
- Hazing by any student organization or individual is against Penn State's code of conduct, and also is a violation of Pennsylvania law. To report instances of hazing within any student organization or group, including fraternities and sororities, contact the Office of Student Conduct (<http://studentaffairs.psu.edu/conduct> or 814-863-0342), or the Penn State Hotline at 800-560-1637 or <http://hotline.psu.edu>.

## Research-Related Concerns

- Any research-related concerns should be directed to the Office for Research Protections at 814-865-1775 or [orp@psu.edu](mailto:orp@psu.edu).
- Research misconduct concerns should be directed to 814-865-1775 or [researchconcerns@psu.edu](mailto:researchconcerns@psu.edu).

## Some Key Penn State Policies

- AD88 – Code of Responsible Conduct: <https://policy.psu.edu/policies/AD88>
- HR91 – Conflict of Interest: <https://guru.psu.edu/policies/OHR/hr91.html>
- RP02 – Addressing Allegations of Research Misconduct: <https://guru.psu.edu/policies/RP02.html>
- RP06 – Disclosure and Management of Significant Financial Interests: <https://guru.psu.edu/policies/RP06.html>
- AD74 - Compliance with Clery Act: <https://policy.psu.edu/policies/ad74>
- AD77 - Engaging in Outside Professional Activities (Conflict of Commitment): <http://guru.psu.edu/policies/AD77.html>
- AD85 - Sexual Harassment: <https://guru.psu.edu/policies/AD85.html>
- AD86 – Acceptance of Gifts and Entertainment: <https://guru.psu.edu/policies/AD86.html>
- AD91 - Discrimination and Harassment and Related Inappropriate Conduct: <https://guru.psu.edu/policies/AD91.html>

## Where to Start

If it is not clear where to turn for assistance, any of the following offices will guide you to someone who can help:

- Office of Human Resources, Labor and Employee Relations at 814-865-1473 or <http://ohr.psu.edu/employee-relations/>
- Office of University Ethics and Compliance at 814-867-5088 or <http://www.universityethics.psu.edu/>
- Office of Affirmative Action at 814-863-0471 or <https://affirmativeaction.psu.edu/>
- Office of Sexual Misconduct Prevention and Response at 814-867-0099 or <https://titleix.psu.edu/>
- Office of Student Conduct at 814-863-0342 or <http://studentaffairs.psu.edu/conduct>
- Office of Internal Audit at 814-865-9596 or <http://www.internalaudit.psu.edu/>
- Clery Act Compliance Manager at 814-863-1273 or <http://www.police.psu.edu/clery/>
- Your campus, college, or unit's Human Resources Strategic Partner. Contact information is available at <https://hr.psu.edu/content/hr-strategic-partner-and-consultant-directory>.

## **II.2 OTHER RESOURCES FOR GRADUATE STUDENTS**

### **Counseling and Psychological Services (CAPS)**

CAPS can help students resolve personal concerns that may interfere with their academic progress, social development, and satisfaction at Penn State. Some of the more common concerns include difficulty with friends, roommates, or family members; depression and anxiety; sexual identity; lack of motivation or difficulty relaxing, concentrating or studying; eating disorders; sexual assault and sexual abuse recovery; and uncertainties about personal values and beliefs. See <http://studentaffairs.psu.edu/counseling/>.

### **The Graduate & Professional Student Association (GPSA)**

The GPSA, <http://gpsa.psu.edu/>, is the representative body for all graduate students. The GPSA addresses issues of concern to graduate students, and elects members to sit on shared-governance bodies of the University. The GPSA also organizes social events for graduate students. Members and officers of the GPSA can help graduate students become more involved (academically or socially) in University life. The GPSA office has information on most services available at Penn State. If students need help navigating campus, various offices around campus and finding other organizations, the GPSA can help.

## **II.3 HEALTH SERVICES AND HEALTH INSURANCE**

The University Health Service is located in the Student Health Center, which is adjacent to the Eisenhower Parking Deck and the Bank of America Career Services Building, off Bigler Road. Its facilities are available to all students, including graduate students at all levels of training. See <https://studentaffairs.psu.edu/health>.

Health insurance is mandatory for all graduate students, and students with a teaching assistantship or a research assistantship appointment are automatically enrolled. As a graduate assistant or graduate fellow, you are eligible to receive subsidies for the medical, dental and vision plans for you and any eligible dependents. Students enrolled in the University health insurance plan have their premiums automatically deducted from their paychecks.

Deadlines and policies can be found at <https://studentaffairs.psu.edu/health>, or contact University Health Services directly at 814-862-0774 if you have any questions regarding Penn State student health insurance.

## **II.4 SELECTING AND ENROLLING IN CLASSES, AND PAYING TUITION BILLS**

### **LionPATH**

LionPATH (<https://lionpathsupport.psu.edu/>) is Penn State's student information system. It provides students with access to their academic, registration, and financial records. Students can enroll for classes, view/accept their financial aid awards, and view their tuition bills using LionPATH.

#### First Login to LionPATH

The first time that a student logs in to LionPATH, he/she must sign the Consent to Do Business Electronically agreement in order to use the system. While not technically a part of enrollment, this screen will prevent all other actions until students have clicked the box to indicate their agreement. If students do not agree, they will have to conduct LionPATH business outside of the system.

### Each Semester in LionPATH

Students will not be eligible to enroll in classes for each semester until they have completed the Pre-Registration Activity Guide, which includes verification of emergency contact information and the Financial Responsibility Agreement (FRA). The FRA is a promise to take financial responsibility for payment of the student account. A Financial Responsibility hold will remain on a student's account until he/she has completed the Activity Guide. If not yet completed, the Activity Guide can be found in the student's To Do List within the LionPATH Student Center. For more information on how to complete the Pre-Registration Activity Guide, see <http://lionpathsupport.psu.edu/student-help/>.

### Course Registration in LionPATH

All students must register for classes prior to the late registration period for each semester, which can be found at <http://www.registrar.psu.edu/academic-calendars/>. If you do not register before that date, you will be assessed a late-add fee and a late-registration fee. If you are on a half-time graduate assistantship (the usual case for most ME graduate students), you must register for 9-12 credits per semester. International students must be registered full-time, or for nine credits, to maintain their visa status. Further information for international students is given in Section II.6 below.

### Course Selection for New Students

Courses for the first semester will be selected after consultation with the ME Associate Department Head for Graduate Programs, unless a permanent adviser has already been selected. A typical course load for a first-semester student is three 3-credit courses, plus the ME Colloquium (ME 590, 1 credit). For lists of suggested courses in specific areas of interest, see Section III.11 below.

### Course Selection for Continuing Students

Courses will be selected after consultation with your academic adviser. For Ph.D. students, the courses will be in accord with the program approved by your doctoral committee.

### **Full-Time Academic Status**

Full-time academic status is satisfied by taking an appropriate course load. Most loan-granting agencies and other organizations will consider a nine-credit course load to be full-time status, fulfilling their registration requirements. The U.S. Immigration and Customs Enforcement (ICE) requires that all international students on student visas must maintain full-time academic status during the fall and spring semesters. Exceptions to this rule are possible under certain conditions. Students should contact the University Office of Global Programs for further information. For ICE purposes, a course load of nine credits is considered full-time during the fall and spring semesters. During the summer, graduate students generally do not need to register, unless they are taking their Ph.D. Comprehensive Examination or Final Oral Examination during the summer. Any graduate student registered for ME 601 (Note: Student must have passed the Ph.D. Comprehensive Exam in the prior semester to be eligible to enroll in ME 601) is considered to have full-time academic status. For full details, see the Graduate Bulletin website at <https://bulletins.psu.edu/graduate>.

## **Tuition Bills**

After enrolling in classes, all students will receive a tuition bill that can be viewed in LionPATH. Students who are on an assistantship should monitor their bill closely, and inform the ME Graduate Programs Office if they are assessed a late fee. A delay can exist between the timing of the Bursar's bill due dates and when tuition payments for students on assistantships are processed.

## **II.5 EXPECTATIONS AND RESPONSIBILITIES OF GRADUATE STUDENTS**

### **Academic Adviser**

Each graduate student must have an academic adviser, who is chosen in agreement between the student and the faculty member. For Master's Degree students, the faculty member who supervises the student's thesis (or paper) will be the academic adviser. For doctoral students, the research adviser will be the academic adviser. The Associate Department Head for Graduate Programs will initially act as the temporary adviser for incoming graduate students.

Master's Degree students with academic advisers who are not members of the ME Graduate Faculty are required to have a co-adviser who is a member of the ME Graduate Faculty. Contact the Graduate Programs Office if you are in doubt about the graduate faculty status of a faculty member.

It is imperative that students identify an academic adviser as early as possible in their program of study; preferably by the end of their first semester. It is the student's responsibility to reach out to faculty about the availability of research assistantships and research topics of mutual interest. For students who are not self-funded, it is important to understand whether or not the faculty adviser will be able to fund them as a research assistant before a commitment is made.

A list of faculty members in Mechanical Engineering can be found at the ME website: <https://www.me.psu.edu/departments/faculty-staff-list.aspx>. The ME faculty directory contains information on each ME faculty member, including an overview of the faculty member's expertise or research interest areas, publications, current and past research projects, affiliations, education, honors/awards, etc. The directory is a useful resource for graduate students seeking a research adviser. Alternatively, students can search by research area at <https://www.me.psu.edu/research/labs.aspx>.

### **Graduate Assistants**

Most ME graduate students are appointed as graduate assistants. Graduate assistants are assigned tasks in teaching, research, or other activities that are educationally significant. The privileges and benefits and the obligations and responsibilities of graduate assistants are as follows:

#### Privileges and Benefits

- Eligible for financial assistance, including tuition and a stipend.
- Eligible for services at the Student Health Center.
- Eligible to use Penn State Career Services: <https://studentaffairs.psu.edu/career/>.
- Eligible to participate in the programs of GPSA.
- Eligible to join student organizations, except those whose constitutions limit membership to undergraduate students.

### Obligations and Responsibilities

- Maintain satisfactory scholarship.
- Make satisfactory progress in the degree program, that is acceptable to the Department and the Graduate School.
- Assume responsibility for knowing the regulations and pertinent procedures of the Graduate School and the Graduate Bulletin (<https://bulletins.psu.edu/graduate/programs/>).
- Forego other employment while a graduate assistant, as required by the Graduate School.
- Meet standards of conduct outlined by the Division of Student Affairs – Office of Student Conduct – Code of Conduct for Penn State students. See the following website for details: <https://studentaffairs.psu.edu/conduct>.
- Register for the appropriate number of courses/credits per semester.
- Meet the Department's standards of behavior in the performance of assigned duties.
- Exercise the privileges and obligations of academic freedom.

Assistantships are contracts to provide services to the Department in research (a research assistantship) or in teaching (a teaching assistantship), for which a stipend plus tuition coverage is received. Each student's specific duties will be assigned by the faculty member to whom he/she has been appointed. A half-time assistantship allows a student to schedule 9-12 credits per semester, receive a stipend plus grant-in-aid of resident education tuition and certain other benefits, and perform tasks that, on the average, occupy approximately 20 hours per week.

Lack of satisfactory progress or performance of duties can result in termination of the assistantship contract at any time. Graduate students who are appointed for fall/spring assistantships or for fellowships are eligible for the Summer Tuition Assistance Program (STAP). This program allows students who are required to be registered during summer session (e.g., to take their Ph.D. Comprehensive Exam or Final Oral Exam) to have the tuition paid by the Graduate School. Detailed information about eligibility and the application procedure for STAP is sent to all ME graduate students late in the Spring semester.

### **Research Assistants (RAs)**

RAs usually are students who are supported by a faculty member through externally funded research projects. Continuation of a RA is subject to the availability of funding, and on making satisfactory progress and the quality of the work performed. Research duties often coincide with the student's graduate research that they perform to meet their degree requirements.

### **Teaching Assistants (TAs)**

Graduate students are eligible to apply for available teaching assistantships. A call for TA applications is sent out before each fall and spring semester.

### **Additional Summer Funding**

ME typically does not fund TAs during the summer. Students continuing their research or other activities during the summer should pursue research funding through their adviser, internships off campus, or other employment opportunities. Students who are required to register for courses during the summer session may apply for tuition assistance. For

international students to qualify, they must receive a satisfactory score on the AEOCPT test, which is administered by the Department of Applied Linguistics.

## **II.6 INTERNATIONAL STUDENTS**

Penn State policies and procedures for international students are subject to change, to maintain compliance with United States law. All international students are strongly encouraged to check regularly for information and updates at <https://global.psu.edu/category/international-students>. Some current (at the time of this writing) general information for international graduate students is provided in the following.

In order for international students with student visas to maintain their visa status through Penn State, they must meet several obligations which are listed in detail on the Office of Global Programs website at <https://global.psu.edu/category/international-students>. Regardless of whether or not an international student is receiving a graduate assistantship, he/she must maintain full-time academic status. Nine credits in each of the fall and spring semesters (excluding courses taken for audit) is the minimum required to fulfill Department of Homeland Security (DHS) visa requirements for full-time enrollment. A Ph.D. candidate who has successfully completed the Comprehensive Examination and is registered for ME 601 is also considered to be a full-time student. As noted earlier, graduate students generally do not need to register during the summer, unless they are taking their Ph.D. Comprehensive Examination or Final Oral Examination during the summer.

Exceptions to full-time study must be approved by the faculty adviser and department in advance by completing the [Reduced Course Load](#) eForm in iStart. All exceptions granted by the International Student Adviser must be reported to DHS within 21 days, as well as the return to full-time status. Exceptions to full-time study due to academic difficulties are limited to one semester during the entire program of study; documented medical illnesses are limited to one year during the program of study. Failure to enroll for full-time study will be reported in the Student and Exchange Visitor Information System (SEVIS) as a violation, and the student's SEVIS record may be terminated for "unauthorized drop below full course level."

DHS requires that international students proceed in a timely fashion toward completion of their degrees, as established by the academic department and (usually) stated on their initial immigration document. Failure to maintain normal progress toward completion of the degree during this period will jeopardize the student's ability to continue academic study, adjust status, or seek future employment in the United States. Because of this, students should not be enrolled less than full-time during fall or spring semester without approval of the Directorate of International Student and Scholar Advising (DISSA). DHS requires DISSA to report violations of status, including failure to maintain full-time enrollment.

In an effort to make required immigration processes for international students more efficient, less expensive, and more secure for all parties, the University Office of Global Programs (UOGP) has transferred all processes to a paperless system called iStart. For any questions regarding visas, academic status, work permits, etc., students should contact UOGP at <https://global.psu.edu>.

**Employment Requirements/Options for International Students**

As noted earlier, all international students must be enrolled full-time. International students generally may work up to 20 hours per week during the fall and spring semesters, and up to 40 hours per week on campus during the summer.

Curricular practical training (CPT), employment which is an integral part of an established curriculum, is available to F-1 students who have been lawfully enrolled on a full-time basis for one academic year. Students in English-language programs are ineligible for practical training. To be considered CPT, the work must not only be related to the major field of study but must also be an integral or important part of the student's studies.

Students who have been in F-1 status for at least one academic year are eligible for optional practical training (OPT), which is temporary employment in their field of study for purposes of gaining practical experience.

For further information pertaining to employment of International Students, please refer to the UOGP website at <https://global.psu.edu/>.

**American English Oral Communicative Proficiency Test (AEOCPT)**

All international students who have been offered teaching assistantships that involve interaction with undergraduate students are required to have passed the AEOCPT. This test is administered before the semester begins by the Department of Applied Linguistics. See <https://aplng.la.psu.edu/programs/about-the-aeocpt>.

## **Section III –Academic Policies and Procedures**

### **III.1 GRADUATE BULLETIN**

The Graduate Bulletin (<https://bulletins.psu.edu/graduate/>) contains University-level policies established by the Graduate School regarding academic procedures, registration requirements, conduct, resolution of problems and procedures for termination, M.S. degree and Ph.D. degree requirements, as well as other procedures, regulations and requirements related to graduate study.

### **III.2 UNSATISFACTORY SCHOLARSHIP**

A graduate student who fails to maintain satisfactory scholarship or to make acceptable progress in a degree program may be dropped from the University. One or more failing grades, or a cumulative grade-point average below 3.00 for any semester or session or combination of semesters and/or sessions, may be considered as evidence of failure to maintain satisfactory scholarship. Action may be initiated by the department or committee in charge of the graduate major or by the chair of the student's committee. See <https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-800/gcac-803-procedures-termination-unsatisfactory-scholarship/> for further information.

### **III.3 DEADLINES**

It is the responsibility of the student, working with his/her adviser and committee, to ensure that all relevant deadlines established by the Graduate School are met: see <https://gradschool.psu.edu/completing-your-degree/important-deadlines/>. Extensions should not be expected, and are granted by the Graduate School only under exceptional circumstances.

### **III.4 MINORS**

Many ME students take graduate-level minors in other programs, or in specific areas such as the Graduate Minor Program in Computational Science (<https://bulletins.psu.edu/graduate/programs/minors/computational-science-graduate-minor>). It is the student's responsibility to make sure that all requirements are met. Ph.D. students must inform the Graduate School of their intent to take a graduate-level minor before taking their Comprehensive Exam. Minors must be requested in conjunction with the establishment of Ph.D. committee, or prior to the semester of graduation for M.S. students. The Graduate School may decline late requests, as the intent is that a minor should be an integral part of the student's graduate program, not an afterthought.

### **III.5 CONCURRENT DEGREES**

Students who wish to pursue a concurrent degree must be officially admitted to the concurrent degree program prior to substantial completion of the home degree. Specifically, students in master's or professional doctoral degree programs must be officially admitted to pursue a concurrent degree prior to having accumulated 75% or more of the credits required for the home degree and prior to their final semester in the home degree. Research doctorate (Ph.D.) students must be officially admitted to the concurrent degree program prior to scheduling the Comprehensive Examination in the Ph.D. program. See <http://gradschool.psu.edu/graduate-education-policies/gcac/gcac-200/gcac-209->

[concurrent-degrees/](#) for the complete policy. You should contact the ME Graduate Programs Office if interested in pursuing a Concurrent Degree.

### III.6 GRADING SYSTEM

Grades are assigned to students on the basis of the instructor's judgment of the student's scholastic achievement, using the grading systems that can be found at <https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-400/gcac-401-grading-system/>. A minimum grade-point average of 3.00 for work done at the University is required for graduation.

### III.7 COURSE LOAD

Course load requirements have been discussed in previous sections. If in doubt, contact the Graduate Programs Office before scheduling courses, especially for the summer.

M.S. students are not required to register for course work or research once the minimum course requirements have been met, although international students may need to continue to register for courses to maintain their visa status. After passing the Comprehensive Exam, all Ph.D. students must maintain "continuous registration," which requires them to register for ME 601 (Ph.D. Thesis Preparation) for the fall and spring semesters. If Ph.D. students plan to take their Comprehensive Exam or their Final Oral Exam during the summer session, they must be registered during that summer. Also, Ph.D. students must spend at least two semesters over some 12-month period during the interval between completion of the Qualifying Exam and completion of the Ph.D. program as a registered full-time student; see <https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-600/gcac-601-residency-requirement-research-doctorate>.

### III.8 ADDING AND DROPPING COURSES

If you are considering adding or dropping a course, there are several factors to consider:

- Is there still time to drop or add a course?
- Will dropping a course affect my progress towards my degree?
- Will a change in my course schedule have financial implications?
- If an international student, will a change in my course schedule have an impact on my visa status? Recall that international graduate students must maintain full-time registration to maintain their visa status during the fall and spring semesters.

Penn State maintains three periods relating to course drops in each semester: the pre-semester period, the regular add/drop period, and the late-drop period:

1. The pre-semester period begins on the first day of scheduling and ends the day before the semester starts. While exceptional circumstances may necessitate the need to process schedule changes after classes begin, students are encouraged to finalize all schedule changes prior to the first day of classes for the semester.
2. The regular drop/add period begins the day that your courses start, and is when dropping a course can be done without incurring a drop/add fee. The length of the period is six days from the beginning of the semester during fall/spring for full-semester courses, and is a calculated proportional length for other courses. See <https://www.registrar.psu.edu/academic-calendars/>. No signatures are required during this period.

3. A student can drop a course with certain restrictions and requirements after the regular drop/add period. The late-drop period starts the day after the regular drop period, and ends on the late-drop deadline for the semester. During this period:
  - No signatures are required;
  - A fee is imposed for each transaction; and
  - Courses are recorded on the student's transcript as "LD."

Changing your overall number of credits after classes begin can have financial implications. Before making any registration changes, consult with your academic adviser.

- If you drop below full-time status, that can impact the tuition, fees, student aid, and refunds applied to your bursar account. Additionally, during the late-drop period, the University assesses a processing fee for any course that is dropped or added. Any tuition adjustment is determined by the effective date of the drop, and is made according to Penn State's Tuition Adjustment Schedule (<https://www.bursar.psu.edu/tuition-adjustment-policy>). If a full-time graduate student drops a course but remains at full-time status, the tuition rate does not change.
- You should also investigate whether or not you would meet the "Satisfactory Academic Progress" standards for federal financial aid programs when considering a course drop. Details about satisfactory academic progress is available at <https://studentaid.psu.edu/>.
- During the pre-semester period, you can add and drop courses as many times as needed to create a suitable schedule, without unfavorable financial implications. Please be mindful to check your tuition bill for updates if you make changes to your schedule (especially if adding credits) after you have paid your tuition bill.

### **III.9 AUDITING COURSES**

Requests to take a course for audit must be made to the program that offers the course, and requires permission from the instructor. Courses taken formally as audit are not included in the maximum number of credits required for assistantships or for satisfying visa requirements for international students. The request to audit a course must be done by the fourth day of classes within the regular drop/add period. Adding of an audited course after the regular drop/add period is not permitted. Courses cannot be changed to an audit after the semester has begun.

### **III.10 TRANSFER OF CREDITS**

#### **Transfer of Credit from an External Institution**

1. A maximum of six credits of high-quality graduate work done at a regionally accredited institution or recognized degree-granting institution may be applied toward the requirements for a Master's Degree. However, credits earned to complete a previous degree, whether at Penn State or elsewhere, may not be applied to a Master's or Doctoral degree at Penn State. Credit transfers are not allowed for the Ph.D. degree.
2. Approval to apply any transferred credits toward a degree program must be granted by the program head or graduate officer, and by the Graduate School.
3. Transfer credits must meet the following criteria:
  - Must have been earned at a regionally accredited institution or a recognized degree-granting institution in the United States;

- Must be of "A" or "B" grade value ("B-" grades are not acceptable; pass-fail grades are not transferable unless substantiated by the former institution as having at least "B" quality);
- Must appear on an official graduate transcript; and
- Must be earned within five years prior to the date of registration to a degree program at Penn State.

Application forms for transfer of credit can be found at <https://gradschool.psu.edu/current-students/>.

### **Transfer of Nondegree Graduate Credits**

Approval to apply nondegree graduate credits toward a degree program must be granted by the program head or graduate officer, and by the Graduate School. A maximum of 15 credits earned at Penn State as a nondegree student may be applied to a degree program.

- The credits must have been earned within five years preceding entry into the degree program. Requests to transfer graduate work taken more than five years prior to admission into a graduate degree program must be accompanied by a letter justifying the validity of the course work.
- Only 400, 500 and 800-level graduate courses may be transferred.
- Only A, B, and C grades may be transferred.

Forms for transfer of credit may be obtained from the graduate programs office.

### **III.11 SUGGESTED CORE COURSES**

Students are expected to select courses and to write a thesis or paper in one or more general subfields within Mechanical Engineering, which may include:

#### Thermal Sciences

Heat Transfer  
Combustion  
Fluid Mechanics

#### Mechanical Sciences

Systems and Controls  
Dynamics, Vibrations and Noise Control  
Solid Mechanics and Mechanical Design

The following listings of suggested courses in each of six general areas are provided for guidance. Your adviser and/or committee may suggest alternative or additional courses. Most of the courses listed below are offered on a regular basis. New experimental courses may be offered from time to time; these will be numbered as ME497x for upper-level undergraduate courses, or as ME597x for graduate courses. The on-line schedule of courses for each semester will show which courses are being offered that semester.

<b>FIELD</b>	<b>CORE COURSES</b>	<b>RELATED COURSES</b>
Heat Transfer	ME 512, 513, 514, 521, 523	ME 411, 504, 515, 520, 522, 527, 530
Combustion	ME 521, 530, 532, 535, 537	ME 400, 404, 430, 431, 432, 504, 512, 513, 514, 520, 522, 523, 527, 533; AERSP 412
Fluids	ME 512, 513, 520, 521, 522, 523; AERSP 423	ME 405, 420, 514, 515, 524, 526, 527, 530, 532
Systems and Controls	ME 550, 554, 555	ME 455, 558, 559

Dynamics, Vibrations and Noise Control	ME 571, 572, 573, 580, 581	ME 452, 470, 471; ACS 510; E MCH 525
Solid Mechanics and Mechanical Design	ME 560, ME 563, ME 564, 565; E MCH 507, 560, ME 560	ME 460, 461, 462, 463, 480, 481, 546, 572; CE 541, 548; E MCH 506, 509, 531, 532, 540, 546

### III.12 COLLOQUIUM REQUIREMENT (ME 590)

All ME graduate students must successfully complete two credits of Mechanical Engineering Colloquium (ME 590), preferably in their first two semesters in the program. For M.S. students, these two credits are not counted towards the 30-credit total required for completion of the M.S. degree.

### III.13 RESEARCH COURSES: ME 596, 600 (610), and 601 (611)

Graduate students registering for these courses must first consult with their adviser (or the instructor if different from adviser) to ensure that they are registering for the appropriate course and section. Failure to select the correct course may result in the student having to pay retroactive drop/add fees, and possibly additional course-credit fees. The ME Graduate Programs Office staff can assist graduate students in registering for the appropriate research course and section.

ME 596 - INDIVIDUAL STUDIES "Paper Research" - Creative projects, including non-thesis research, that are supervised on an individual basis and which fall outside the scope of formal courses. **ME 596 cannot be used for M.S. Option A (thesis option) or for Ph.D. thesis research. ME 596 is appropriate for the M.S. Paper Option (Option B) or for M.S. Option C (Ph.D. Research Proposal);** see Section IV.1 below. Three credits of ME 596, supervised by the student's adviser, can be counted toward the 30-credit total when following M.S. Option B or M.S. Option C.

ME 600 (or ME 610 for off campus) - THESIS RESEARCH - **This course should be used to register for research credits for M.S. Option A (thesis option) or for Ph.D. thesis research.** A minimum of six credits of ME 600/610 is required for M.S. Option A. There is no limit on the maximum total number of credits of ME 600/610 that a student can take. However, there is a maximum number of credits for which a student can receive a quality letter grade (A, B, etc.): a maximum of six credits for M.S. Option A, a maximum of 12 credits for the Ph.D., and a maximum of 18 credits for a Ph.D. student who does a M.S. thesis on the way to his/her Ph.D. A student must receive a non-letter grade (R, etc.) for any additional credits of ME 600/610. The R grade can be assigned for satisfactory completion of research for any credits beyond the maximum. See <https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-400/gcac-401-grading-system/>.

ME 601 (or ME 611 for part time) - Ph.D. THESIS PREPARATION – **This course is limited to Ph.D. students who have passed their Comprehensive Examination.** Ph.D. students are eligible to enroll in ME 601/611 in the semester following the successful completion of their Comprehensive Exam, and after they have met the two-semester Ph.D. residency requirement (<https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-400/gcac-401-grading-system/>).

[600/gcac-601-residency-requirement-research-doctorate](#)). Ph.D. students can register for one additional course either for credit or audit (up to three credits) when they are registered for ME 601/611. Students who are eligible must contact the ME Graduate Programs Office staff to enroll in ME 601/611. Note that ME 601/611 cannot be used to meet the residency requirement.

### **III.14 SCHOLARSHIP AND RESEARCH INTEGRITY (SARI) REQUIREMENT**

The SARI program is an opportunity to engage graduate students broadly in a dialog surrounding issues pertinent to research ethics (<https://www.research.psu.edu/training/sari>). All Penn State graduate students are required to meet the SARI requirements before graduating, preferably within the first year of their graduate program. SARI has two parts:

- SARI RCR (Responsible Conduct of Research) – to be completed during a student's first year
- CITI (Collaborative Institutional Training Initiative) – to be completed during a student's first semester

#### **SARI RCR Overview**

Every student must complete five hours of discussion-based SARI RCR education during his/her first year. SARI RCR hours can be earned through various workshops and/or seminars that are available through the College and from other sources. CITI online training does not count toward the five hours of SARI RCR.

#### **CITI On-line Training**

All ME graduate students are required to complete the on-line CITI training program for engineering within their first semester. Completion of the CITI program will result in a certificate of completion. Failure to comply will preclude certification for graduation by the Department. To complete this training:

1. Go to <https://citi.psu.edu/>.
2. Select "Log in to CITI" under University Park.
3. Enter your PSU credentials. (If this does not work, go to <https://www.citiprogram.org/> instead, and create a username and password to access the CITI online training.)
4. Select the course called "Responsible Conduct of Research (RCR) – Basic."
5. Remember to email the certificate to [grad@me.psu.edu](mailto:grad@me.psu.edu) after successfully completing the course.

## Section IV – Degree Programs

The Department of Mechanical Engineering offers two graduate degree programs for resident students: a Master of Science (M.S.) program, and a Doctor of Philosophy (Ph.D.) program. Both are research-based programs. The M.S. program is also available online, through Penn State World Campus (<https://www.worldcampus.psu.edu>).

### IV.1 MASTER OF SCIENCE (M.S.) DEGREE PROGRAM

The objective of the M.S. degree program is to gain advanced knowledge for research, analysis, and design in Mechanical Engineering.

#### M.S. Degree Requirements

Principal coursework and other requirements are as follows.

1. A minimum of 30 eligible course credits, of which 20 must be earned at University Park. The required course credits must be completed with a grade point average of 3.00 or higher. Further specifications follow.
2. A minimum of 18 of the 30 credits must be at the 500- and 600-level. See additional specific requirements for Options A, B and C below.
3. A minimum of 12 of the 30 credits must be 400- and 500-level course credits in Mechanical Engineering. ME 410, 440, 450, 454, and any other required courses in Penn State's ME undergraduate curriculum cannot be included in these 12 credits. If in doubt, contact the Graduate Programs Office before enrolling in a ME 400-level course. ME 596 and ME 600 cannot be counted toward fulfilling this requirement.
4. A minimum of three of the 30 credits must be eligible mathematics credits. These credits must be taken from the following group of courses: E MCH 524A, E MCH 524B, ME 512, ME 550, ME 597 (Advanced Engineering Math), and all 400- and 500-level "MATH" designated courses (MATH 4XX, MATH 5XX) except MATH 419, 427, 428, 435, 451, 455, 456, 461, 470, 471, 475, 475W, 482 and 484. Courses with a specific focus on numerical analysis cannot be used to meet the mathematics requirement.
5. M.S. paper or thesis presentation. All M.S. students must present the results of their thesis or paper at a meeting consisting (at a minimum) of their adviser and the thesis or paper reviewer (who must be a member of the ME graduate faculty). This requirement may be waived if the student makes a presentation related to his/her thesis or paper at a national or international scientific conference.
6. Preparatory course(s) required for teaching assistants (such as ENGR 888), remedial courses, and any courses required in Penn State's ME undergraduate program cannot be counted toward meeting the 30-course-credit requirement. Nontechnical courses may be accepted on a limited basis. The student should check with his/her adviser or the ME Graduate Programs Office, if in doubt. See the M.S. Transcript Audit section below.

7. ME Colloquium. All students must successfully complete two credits of ME 590, preferably in their first two semesters in the program. These two credits do not count toward meeting the 30-course-credit requirement.
8. SARI/CITI. All students must complete the SARI/CITI requirements.

### **Three M.S. Degree Options**

There are three options for the M.S. degree, which are outlined in the following. Each M.S. student must choose one of these three options, in consultation with his/her adviser.

#### OPTION A – M.S. THESIS

Candidate registers for a minimum of six credits of ME 600 (see Section III.13 above) and submits a thesis following the procedures specified by the Graduate School. These six credits of ME 600 count toward meeting requirements 1 and 2 above, but not toward meeting requirement 3. Any additional 600 credits cannot be counted toward meeting degree course-credit requirements. This option therefore requires at least 24 additional course credits, of which a minimum of 12 credits must be at the 500 level, and a minimum of 12 credits must be eligible 400- or 500-level Mechanical Engineering courses. ME 596 does not count towards meeting the requirements for the thesis option.

#### OPTION B – M.S. PAPER

Candidate registers for three credits of ME 596 (see Section III.13 above), which count toward meeting the 30-course-credit requirement. This option therefore requires at least 27 additional course credits, of which a minimum of 15 credits must be at the 500 level, and a minimum of 12 credits must be eligible 400- or 500-level Mechanical Engineering courses. The candidate writes a paper on a topic mutually agreed upon with the adviser, and that is suitable for publication in a professional journal or presentation at a national or international conference. See the M.S. Paper Guide below for expectations. ME 600 does not count towards meeting the requirements for the paper option.

#### OPTION C – Ph.D. RESEARCH PROPOSAL

Ph.D. candidates must submit a dissertation research proposal, demonstrating scholarship and the ability to plan a major research activity, to their doctoral committee for approval. In Option C, the research proposal replaces the M.S. paper in Option B above. Other requirements are:

1. Successful completion of the Ph.D. Qualifying Examination;
2. Completion of the Option B (not Option A) course requirements;
3. Notifying the ME Graduate Programs office of the intent to exercise this option *prior to scheduling the Ph.D. Comprehensive Exam*.
4. Acceptance of the research proposal by the student's doctoral committee: i.e., successfully passing the Ph.D. Comprehensive Exam.

### **M.S. Transcript Audit**

The form on the following page is used by the ME Graduate Programs Office to check that M.S. degree requirements have been met prior to approval for graduation. Candidates can use this as a checklist over the course of their degree program to make sure that they are on track to meet the degree requirements.

## M.S. Transcript Audit

Degree Option (select one): Option A, Option B, or Option C

1. Minimum of 30 eligible course credits
  - ME 590 does not count
  - SYSEN courses require approval. Other non-ME courses may require approval. Check with adviser and/or the ME Graduate Programs Office, if in doubt.
  - Option A: 6 credits of ME 600 are required, plus 12 additional 500-level credits; ME 596 does not count
  - Options B or Option C: 3 credits of ME 596 are required, plus 15 additional 500-level credits; ME 600 does not count
  - List of courses meeting this requirement:
2. Minimum of 18 credits in 500- and 600-level courses
  - ME 590 does not count
  - Option A: 6 credits of ME 600 are required, plus 12 additional 500-level credits; ME 596 does not count
  - Options B or Option C: 3 credits of ME 596 are required, plus 15 additional 500-level credits; ME 600 does not count
  - List of courses meeting this requirement (a subset of the courses listed under 1 above):
3. Minimum of 12 credits in 400- or 500-level ME courses
  - ME 590 does not count
  - See restrictions in the ME Graduate Student Handbook
  - List of courses meeting this requirement (a subset of the courses listed under 1 above):
4. Minimum of 3 credits of eligible math courses
  - See restrictions in the ME Graduate Student Handbook
  - Course meeting this requirement (one of the courses listed under 1 above):
5. Two credits of ME 590
  - Semesters taken:
6. Other courses taken that don't count toward meeting degree requirements
  - List of other courses (courses not listed under 1 above):
7. SARI
  - Requirement met:
8. GPA (minimum 3.0)
  - Candidate's GPA:
9. Thesis (Option A) or paper (Options B or C)
  - Written document and oral presentation signed off by adviser, reader, and grad programs office

## **Additional Information and Guidelines for M.S. Students**

### M.S. Thesis Guide (Option A)

The Graduate School provides a Thesis Guide, which provides templates and formatting instructions that should be used for M.S. theses. These can be found on the Penn State Graduate School site at <https://gradschool.psu.edu/completing-your-degree/thesis-and-dissertation-information/>.

### M.S. Paper Guide (Option B)

To ensure that M.S. papers meet accepted professional quality standards, the following guidelines have been established by the ME Graduate Faculty. Compliance will be monitored and enforced by the paper adviser, the paper reader and the Associate Department Head for Graduate Programs.

In content, length and structure, the paper is expected to be one that would be acceptable for publication in a peer-reviewed professional journal, or for presentation at a peer-reviewed national or international conference. Examples of papers that would not meet this standard would be a technical report to a sponsor, a presentation at a local or regional conference, or a presentation at a conference where selection is not based on a full-paper peer-review process.

In the case of a multiple-author paper, the degree candidate must be the first author, and the paper must be primarily the work of the degree candidate. If there are coauthors other than the degree candidate and his/her faculty adviser, then a brief summary of the contributions of each coauthor and an estimate of each coauthor's percentage of effort must be included.

If the paper has already been published and/or presented or has been accepted for publication and/or presentation, then the actual journal- or conference-formatted paper or manuscript should be submitted. Documentation must be provided to show that the paper has been published and/or presented or has been accepted for publication and/or presentation. The role of the reader in this case is primarily to confirm that the target journal or conference meets the criteria outlined above, and that the documentation is in order.

If the paper has been submitted for publication or presentation, but has not yet been accepted, then the actual journal- or conference-formatted manuscript should be submitted. Documentation must be provided to show that the manuscript is under consideration for publication and/or presentation. If reviewer comments are available, those should be provided. In addition to confirming that the journal or conference is appropriate, the reader in this case will effectively have the role of a peer reviewer, and will judge whether the manuscript is, in principle, suitable for publication in the target journal or presentation at the target conference.

If the paper has not yet been submitted for publication and/or presentation, but will be in the near future, then the requirements in the previous paragraph still apply, with the exception of the requirement to provide documentation that the paper is under consideration.

Finally, if the paper is not one that has been or will be submitted for publication or presentation, then an appropriate target journal or conference must be selected by the student and paper adviser, and the paper must be prepared as if it were going to be

submitted to that journal or conference. An appropriate template to use in this case would be the one that is available for ASME technical papers, for example:

<https://www.asme.org/publications-submissions/proceedings/conference-publications>. In this case, the paper reader must judge whether or not the paper would be acceptable, in principle, for publication in the target journal or presentation at the target conference. This option will place a greater burden on the reader, as he/she will not have the advantage of knowing that external peer reviewers are also reading and evaluating the paper.

#### Selection of a Faculty Reviewer (Reader)

A second ME graduate faculty member (in addition to the adviser) must be designated to serve as the faculty reviewer (or reader) for each M.S. thesis or paper. The reader usually is chosen by the student in consultation with his/her adviser and/or the Associate Department Head for Graduate Programs. The reader should be appointed in a timely manner to ensure that there is sufficient time to review the student's work.

#### Oral Presentation

All M.S. students must present the results of their thesis or paper at a meeting consisting (at a minimum) of their adviser and the thesis or paper reviewer. As noted earlier, this requirement may be waived if the student makes a presentation related to his/her thesis or paper at a national or international scientific conference.

#### Student Responsibilities

A typed draft of the thesis/paper must receive three approval signatures in the order indicated on the M.S. Thesis/Paper Approval Form: 1) the thesis/paper adviser; 2) the thesis/paper reader, and 3) the Associate Department Head for Graduate Programs. The completed approval form must be given to the Graduate Programs Office staff to be recorded and filed.

#### Reader Responsibilities

After reading the student's draft manuscript, the reader should prepare written comments to communicate with the thesis/paper adviser concerning any changes that he/she believes are essential. Minor corrections or editorial changes can be noted without discussion. If the reader wishes to discuss the material with the candidate, it is recommended that be done in the presence of the adviser.

#### Adviser Responsibilities

If there are questions or problems concerning the reader's comments, the thesis/paper adviser should arrange for a discussion with the reader. When the adviser and the reader have reached agreement, the adviser should direct the candidate to make any necessary changes. Minor editorial changes in pencil are acceptable, but major text changes should be retyped before the reader signs the approval form.

#### Deadlines

Key deadlines for each semester can be found on the Graduate School's website: <https://gradschool.psu.edu/completing-your-degree/thesis-and-dissertation-information/thesis-dissertation-performance-and-oral-presentation-deadlines-calendar/>. The Graduate School's deadlines apply primarily to candidates following the thesis option (Option A). Students who are following the paper option (Option B) should contact the ME Graduate Programs Office for deadlines. The ME Graduate Programs

Office will send specific instructions regarding graduation at the beginning of each semester.

If a student submits his/her thesis to the Graduate School after the dates above, but before the semester ends, he/she will graduate at the next scheduled graduation and will not be required to register for the subsequent semester. Upon request, the Graduate School will provide an official letter of certification indicating that the student has completed all the requirements for the degree. Allow two weeks for such a request to be processed.

## **IV.2 WORLD CAMPUS M.S. PROGRAM**

The World Campus Master's of Science in Mechanical Engineering (MSME) degree program is equivalent to the residential Master's Degree program. The programmatic requirements are the same as in Section IV.1 above. Some additional information that is specific to World Campus students follows.

All incoming World Campus MSME students must enroll in the section of ME 590 that is taught by the Director of the Online MSME program in their first term in the program. In this class, students will outline a plan of study and become familiar with the process for research for World Campus students.

All World Campus MSME students should check their Penn State email regularly. All important information from the ME Graduate Programs office, the Graduate School, course instructors, and the Director of the Online MSME program will be sent to that address. If a student is not enrolled in any classes, and their profile is discontinued, they may not be receiving important notifications from University sources. In that case, they should reach out to the Director of the Online MSME program.

All World Campus students must do independent research, complete a final written deliverable, and pass a culminating presentation under the advisement of their research adviser and a second faculty member. Most World Campus MSME students will follow M.S. Option B (paper option), but Option A (thesis option) is also available to them, as it is for resident students.

The typical timelines for research and research adviser matching for WC MSME students will be addressed in the World Campus section of ME 590 in the first semester of the MSME Program, that is taught by the Director of the Online MSME program.

## **IV.3 DOCTOR OF PHILOSOPHY (PH.D) DEGREE PROGRAM**

### **Course Requirements**

There are no specific course credit requirements for the Ph.D. degree, beyond the two-credit Colloquium Requirement (Section III.12 above). Course requirements are established by the adviser and doctoral Committee.

### **PH.D. Qualifying Examination**

A student who has been admitted to the Graduate School and has been accepted by the department or committee in charge of a major program in which the doctorate is offered may begin working toward a doctoral degree. However, the student has no

official status as a doctoral student, and no assurance of acceptance as a doctoral candidate, until the Qualifying Examination has been passed. Graduate School policy and requirements for the Qualifying Examination can be found at <https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-600/gcac-604-qualifying-exam/>.

Graduate students who wish to become doctoral candidates must be approved by the graduate faculty of their major department. The approval is based on:

- a) The academic record of the student;
- b) A Qualifying Examination given by the major department; and
- c) Evidence of research capability based on adviser recommendations.

Therefore, it is essential that a new student begin working with an adviser as soon as possible.

### Purpose

The purpose of the Qualifying Examination is to assess a student's potential to excel in their Ph.D. studies and to conduct research at the highest level in their chosen field of study. Preparing for this examination is expected to help students strengthen their knowledge of fundamentals across the Mechanical Engineering discipline.

### Timing

Full requirements are given at

<https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-600/gcac-604-qualifying-exam/>. Key points are as follows:

- Students are strongly encouraged to take the Qualifying Examination at the earliest possible time that is consistent with Graduate School policy. Normally that will be in the student's third semester of study, excluding summers.
- Students are further encouraged to have a faculty adviser before taking the exam. Historically, students who have been working with a faculty adviser have been more successful in passing the exam.

The ME Ph.D Qualifying Examination is administered two times each academic year, once each in the fall and spring semesters. The exam usually is scheduled during the second week of classes for the semester, and is administered over several days. Dates for the Qualifying Examination will be announced by the Graduate Programs Office by email to all graduate students.

### Format and Evaluation

The format of the examination and the process by which pass/fail decisions are made are detailed in the Appendix to this Handbook.

### **Doctoral Committee**

Immediately after passing the Qualifying Examination, a student must form his or her doctoral committee. Graduate School policy is that the committee must be formed no later than one year after successful completion of the Qualifying Examination.

Committee membership composition is specified in Graduate School policy GCAC-602: <https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-600/gcac-602-phd-committee-formation/>. Committee members are selected by the academic

adviser in consultation with the student, and consistent with GCAC-602. The adviser will recommend the members to the Associate Department Head for Graduate Programs, who in turn will notify the Graduate School. Once a committee is established, any requests to alter the committee membership must be made in writing to the Graduate Programs Office. All members currently on the committee and any member(s) to be added must be copied on the request.

Once the student's doctoral committee has been formed, the remainder of the student's program is under the control of the committee. The ME Graduate Program Office will continue to maintain records and monitor progress. The function and organization of the doctoral committee are enumerated in Graduate School policy GCAC-603: <https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-600/gcac-603-phd-committee-responsibilities/>. Students are encouraged to familiarize themselves with this policy, so that they can work effectively with their committee.

Each student's committee is encouraged to meet as a body at least once a year to review the status of the student's research and program of study. Graduate School policy requires that a written report on each Ph.D. candidate's progress be submitted annually to the program's Graduate Programs office. If there is a substantial change in the student's program of study or research objective, the committee should meet. A written record of this meeting describing these changes must be sent to the Department for inclusion in the student's official records.

### **Residency Requirement**

Over some twelve-month period during the interval between admission to the Ph.D. program (successful completion of the Ph.D. Qualifying Exam) and completion of the Ph.D. program, the candidate must spend at least two semesters (summer sessions are not included) as a registered full-time student engaged in academic work at the University Park campus. Note that ME 601 cannot be used to meet the full-time residency requirement. See <https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-700/gcac-700-a-residency-requirement-professional-doctorates/>.

### **Continuous Registration Requirement**

A candidate for the Ph.D. degree is required to register continuously for each fall and spring semester from the time the Comprehensive Examination is passed and the two-semester residence requirement is met until the dissertation is accepted by the doctoral committee and the final oral examination is passed. See <https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-500/gcac-515-registration-course-work-completed/>.

### **Comprehensive Examination**

The purpose of the Comprehensive Examination is to demonstrate that candidates are qualified to successfully complete the research phase of their program. This requires that students have substantially completed the program of courses approved by their committee with a minimum grade point average of 3.00, and have satisfied the English proficiency requirement (which is assessed as part of the Qualifying Exam). The relevant Graduate School policy is GCAC-606: <https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-600/gcac-606-comprehensive-examination-research-doctorate/>.

The Graduate School requires that all members of the committee be present at the scheduled exam time.

The Comprehensive Exam should cover the specific areas of Mechanical Engineering, designated by the student's doctoral committee, which relate to the student's program and any minor field(s) of study (if elected or required). The Comprehensive Exam will consist of an oral examination administered by the student's Doctoral Committee, which includes two parts:

Part 1: Presentation of a proposal related to dissertation research. The main purpose of this part will be to demonstrate the candidate's technical communications skills and his/her competency of the subject matter closely related to the thesis topic.

Part 2: Structured oral examination. The main purpose of this part will be to demonstrate the candidate's in-depth knowledge in related areas of research.

The Comprehensive Examination also requires a written proposal related to the candidate's planned dissertation research. The written research proposal should include:

- a) Statement of the research problem;
- b) Literature review;
- c) Preliminary results, if available;
- d) Work plan describing methods of analysis and/or experimentation;
- e) Most significant results expected from the research and their impact on the current state of the art in the main area of the research; and
- f) Time schedule to degree completion.

A written exam may also be given, at the discretion of the Committee. A student must receive a favorable vote of at least two-thirds of the members of the Committee to pass the Comprehensive Exam.

The Comprehensive Exam is scheduled by the Graduate School upon request from the Associate Department Head for Graduate Programs, following notification from the chair of the doctoral committee. The student must be registered during the semester of the exam. It is the responsibility of the Ph.D. committee chair to complete all procedures and see that all requirements are met. It is the responsibility of the Ph.D. student to be certain that the committee chair performs these duties in a timely and accurate manner. The Graduate School requires at least two weeks' notice to process exam requests.

### **Dissertation Review**

Graduate School policy governing dissertations can be found in GCAC-607: <https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-600/gcac-607-dissertation-research-doctorate/>.

The Ph.D. dissertation will be reviewed by each member of the student's doctoral committee. Prior to submission to each committee member, the thesis draft should have been read and approved by the thesis adviser. Each member of the committee

should have a minimum of two weeks before the scheduled exam date to carefully read the thesis draft.

### **Final Oral Examination (Dissertation Defense)**

The purpose of this examination is for students to defend their Ph.D. dissertation. The relevant Graduate School policy is GCAC-608: <https://gradschool.psu.edu/graduate-education-policies/gcac/gcac-600/gcac-608-final-oral-examination-research-doctorate/>. Some of the key rules include the following:

1. Requests for scheduling the oral examination should be made in writing by the student's committee chair to the Associate Department Head for Graduate Programs. The Graduate Program Office will then request the exam to be scheduled through the Graduate School. The Graduate School requires at least two weeks' notice for examinations to be scheduled.
2. When a period of more than six years has elapsed between passing of the Comprehensive Examination and the completion of the student's program, the student is required to pass a second Comprehensive Examination before the Final Oral Examination can be scheduled.
3. The Final Oral Examination may not be scheduled until at least three months have elapsed after the Comprehensive Examination was passed.
4. The Final Oral Examination will be administered by the student's entire doctoral committee and will be a defense of the student's dissertation. The final oral exam will be publicized, and members of the academic community are encouraged to attend. The student must receive a favorable vote of at least two-thirds of the members of his/her doctoral committee to pass the exam.

### **Timing and Deadlines**

Key deadlines for each semester can be found on the Graduate School's website: <https://gradschool.psu.edu/completing-your-degree/thesis-and-dissertation-information/thesis-dissertation-performance-and-oral-presentation-deadlines-calendar/>. The ME Graduate Programs Office will send specific instructions regarding graduation at the beginning of each semester.

If a student submits his/her dissertation to the Graduate School after the dates above, but before the semester ends, he/she will graduate at the next scheduled graduation and will not be required to register for the subsequent semester. Upon request, the Graduate School will provide an official letter of certification indicating that the student has completed all the requirements for the degree. Allow two weeks for such a request to be processed.

## **IV.4 FINAL STEPS**

### **Graduate Student Check-Out Sheet**

Before leaving the Department, every student is required to complete a check-out sheet with appropriate signatures and a "Transfer/Separation" form.

### **Exit Interview**

Every graduate student must schedule an exit interview with the Associate Department Head for Graduate Programs. Schedule your interview well in advance of your leaving the University, and complete the required paperwork (available from the Graduate Programs Office) prior to your interview.

## **Appendix: ME Ph.D. Qualifying Examination**

Detailed information about the format of the exam and the decision process is provided in the following. The exams are developed and administered by the members of the ME Graduate Faculty, working closely with the Graduate Programs Office. The exam consists of two general parts: technical exams in core areas of ME, and an English proficiency assessment. Students must pass the technical exams before taking the English proficiency assessment.

### **TECHNICAL EXAMS**

Each student takes written exams and oral exams in three areas, selecting those from the seven available areas listed below. The decision of which areas to choose is made in consultation with the faculty adviser.

#### **Written Exams**

Written exams will be three hours in duration. All written exams will be closed book, unless a different format is announced prior to the exam. Exam problems will be contributed and graded by faculty with expertise in their respective areas. Samples of written exam problems from previous years will be provided to students. Individual written exams will be coded for anonymity in grading.

The material covered in written exams will be at the terminal B.S. level. While the material is based on the baccalaureate degree, the examining committee expects understanding, competency and maturity acquired in graduate study. The committee expects candidates to possess knowledge and understanding of Mechanical Engineering principles, to be able to recall them quickly, and to synthesize them accurately. An important aspect is to assess the way in which the candidate thinks about a given problem and then approaches the solution to that problem.

Three scores, one from each written exam, will be reported on a 0 to 10 scale, with below 5 being a recommended fail and above 7 a recommended pass.

#### **Oral Exams**

Topic areas for oral exams will correspond to those in the written exams. Two faculty evaluators will conduct each oral exam. The student's adviser may observe oral exams but may not ask or answer questions during exams. Three scores, one from each oral exam, will be reported on a 0 to 10 scale with, below 5 being a recommended fail and above 7 a recommended pass. This score will be based on technical performance, and not on oral communication skills.

#### **Pass/Fail Decisions**

A student will be accepted or denied admission to doctoral study in Mechanical Engineering following an evaluation by the Mechanical Engineering Graduate Faculty. This will be done at a special faculty meeting devoted solely to reviewing results from the written and oral exams, and the student's academic record.

At that meeting, the faculty will vote to either pass or fail each student in each of the three sections. Each student must pass three different sections to be admitted into the Ph.D. program.

If a student does not pass all sections on the first attempt, that student will be allowed a second attempt to take the examination. That student must pass each section that is taken on the second attempt. Students will not be required to retake any section(s) that they passed previously; students may switch topic areas for the second attempt.

### **Topic Areas**

The seven currently available topic areas are described below: Solid Mechanics, Rigid Body Mechanics, System Dynamics, Fundamentals of Engineering Analysis, Thermodynamics, Fluid Mechanics and Heat Transfer. Topic areas will be reviewed and updated on a three-year cycle.

A new provisional topic area may be considered by written request to the Graduate Programs Office from at least three Mechanical Engineering Graduate Faculty members, who provide a formal description of the topic area similar to those given below and who volunteer to serve as examiners for the new area. The formal description must contain a list of topics to be covered and citations for at least two textbooks from which students may study the specified topics. A new provisional topic area must be approved by majority vote of the Mechanical Engineering Graduate Faculty before it is offered and added to the list of standard topic areas.

If a standard topic area is not selected by at least one student during any three-year period, the Graduate Policy Committee will consider removing it from the list of standard topic areas. Removal must be approved by majority vote of the Mechanical Engineering Graduate Faculty.

### **SOLID MECHANICS**

Topics may include:

- Equilibrium of a differential element, plane stress and plane strain, stress and strain transformations, stress-strain relations, compatibility conditions, strain energy and Castigliano's theorem.
- Failure theories.
- Uniaxial loading and deformation, statically indeterminate problems, temperature effects, torsion and bending.
- Thin-walled sections.
- Elastic solution of thick-walled cylinders.

Texts: *Advanced Strength and Applied Elasticity*, Ugural and Fenster, Prentice-Hall, 2003. *Energy and Finite-Element Methods in Structural Mechanics*, Chapter 1, Shames and Dym, Taylor & Francis Group, 1996.

Courses that cover relevant material: EMCH 211, 213, 315, ME 360 Mechanical Design; material also reviewed in ME 560 Solid Mechanics.

## RIGID BODY MECHANICS

Topics may include:

- Kinematics of particles, rigid bodies and mechanisms.
- Dynamics of particles, rigid bodies and mechanisms.
- Work, energy and impulse-momentum principles.

Texts: *Engineering Mechanics: Dynamics*, Gray, Costanzo and Plesha, McGraw-Hill.  
*Design of Machinery*, Norton <https://www.amazon.com/Machinery-Resource-McGraw-Hill-Mechanical-Engineering/dp/007742171X>

Courses that cover relevant material: ME 480 Mechanism Design and Analysis, ME 370 Vibrations of Mechanical Systems or equivalent, EMCH 212 Dynamics.

## SYSTEM DYNAMICS

Topics may include:

- Theory and application of mechanical vibrations.
- Modeling of dynamic systems including mechanical, electrical, fluid, thermal and mixed systems.
- Theory and application of feedback control systems.

Texts: *Mechanical Vibrations*, Rao, Prentice Hall. *Vibration of Mechanical Systems*, Sinha, Cambridge University Press. *Dynamic Modeling and Control of Engineering Systems*, Kulakowski, Gardner, and Shearer, Cambridge University Press.

Courses that cover relevant material: ME 370 Vibrations of Mechanical Systems; ME 450 Modeling of Dynamic Systems.

## FUNDAMENTALS OF ENGINEERING ANALYSIS

The written examination will consist of three questions, where one question will be set from each of the following three areas:

1. *Fundamentals of Advanced Calculus*: Numerical Sequences & Series; Continuity; Differentiation; Mean Value Theorem & Taylor Series Expansion; Closed, Bounded, Convex Sets; Riemann-Stieltjes Integral; Sequences & Series of Functions. [Reference Courses: Math 140, 141, and 231] [Typical Online Course (if available): Introduction to Analysis (<https://ocw.mit.edu/courses/mathematics/18-100a-introduction-to-analysis-fall-2012/>)] [Typical Textbooks: (1) Principles of Mathematical Analysis by W. Rudin 1976 – Chapters 1 to 7 (pp. 1-165) and (2) Complex Variables by Brown & Churchill, 8th ed., 2009 – Chapters 1 to 5 (pp. 1-228)]
2. *Fundamentals of Ordinary and Partial Differential Equations*: ODEs and Power series solutions, Linear second order (i.e., elliptic, parabolic and hyperbolic) PDEs; Prototype problems (e.g., Wave equation, Heat equation, Laplace equation); Solution techniques (e.g., Separation of variables, Green's function, Method of characteristics). [Reference Course: Math 251] [Typical Online Courses (if available): (<http://ocw.mit.edu/courses/mathematics/18-03sc-differential-equations-fall-2011>) and (<http://ocw.mit.edu/courses/mathematics/18-152-introduction-to-partial-differential-equations-fall-2011/>)] [Typical Textbooks: (1) Partial Differential

Equations for Scientists and Engineers by S.J. Farlow 1982 – Relevant Chapters and (2) Advanced Engineering Mathematics, 11th ed. by E. Kreyszig 2011 – Relevant chapters]

3. *Fundamentals of Linear Algebra*: Gaussian Elimination; Simultaneous Linear Algebraic Equations; Orthogonal Projections and Least Squares; Eigenvalues and Eigenvectors; and Quadratic Forms & Positive Definite Matrices. [Reference Course: Math 220] [Typical Online Course (if available): <https://ocw.mit.edu/courses/mathematics/18-06sc-linear-algebra-fall-2011/>] Typical Textbooks: (1) Linear Algebra and Its Applications, 4th ed. by G. Strang 2006 – Chapters 1 to 3 and Chapters 5 & 6 and (2) Linear Algebra Done Right, 2nd ed. By S. Axler 1997 – Chapters 1 to 6 (pp 1-122)]

Although each of the three questions in the written examination will be based on undergraduate syllabi, review of the graduate course ME (EE) 550 *Fundamentals of Engineering Systems Analysis*, which is scheduled to be offered in the Fall semester of every year, could be useful for graduate understanding of the undergraduate materials in both written and oral examinations.

### THERMODYNAMICS

Topics may include:

- First- and Second-Law analysis of steady and transient systems from the energy and availability standpoint;
- Properties of pure solids, liquids and real and ideal gases; mixtures of gases and liquids;
- Psychrometrics;
- Thermochemical calculations and chemical equilibrium;
- Analysis of energy conversion devices.

Text: *Fundamentals of Engineering Thermodynamics*, Moran and Shapiro, Wiley.

Courses that cover relevant material: ME 300 Engineering Thermodynamics, ME 400 Thermodynamics of Propulsion and Power Systems, and ME 430 Introduction to Combustion, or equivalent.

### FLUID MECHANICS

Topics may include:

- Basic principles: constitutive relations, Eulerian/Lagrangian descriptions of fluid motion, fluid properties, stream function, and vorticity.
- Hydrostatics and pressure.
- Application of conservation equations in both integral and differential form to fluid systems.
- Internal viscous flows: velocity and pressure distributions in laminar and turbulent flows, transition to turbulence, and pipe flow.
- External flows: boundary layer theory, separation, lift, and drag.
- Approximations used in fluid mechanics: Bernoulli equation, potential flow theory, and Stokes flow.
- Dimensional analysis and turbomachinery.

Texts: *Fluid Mechanics*, Cengel and Cimbala, McGraw-Hill. *Fluid Mechanics*, White, McGraw-Hill. *Fundamentals of Fluid Mechanics*, Munson, Young, and Okiishi, Wiley. *Introduction to Fluid Mechanics*, Fox & McDonald, Wiley. *Viscous Fluid Flow*, White, McGraw-Hill. Or similar texts.

Courses that cover relevant material: ME 320 Fluid Flow, ME 420 Compressible Flow I, and review of material in ME 521 Foundations of Fluid Mechanics I, or equivalent.

## HEAT TRANSFER

Topics may include:

- Conduction--transient and steady state;
- Convection--laminar and turbulent flow for internal and external, forced and natural convection systems;
- Thermal radiation;
- Heat exchanger thermal analysis and design.

Text: *Fundamentals of Heat and Mass Transfer*, Incropera and DeWitt, Wiley.

Courses that cover relevant material: ME 410 Heat Transfer; material also reviewed in ME 411 Heat-Exchanger Design, ME 512 Conduction, ME 513 Convection, and ME 514 Radiation.

## **ENGLISH PROFICIENCY ASSESSMENT**

A candidate for the degree of Doctor of Philosophy is required by the Graduate School to demonstrate high-level competence in the use of the English language, including reading, writing and speaking. In ME, the English proficiency assessment has two parts: oral communication and written communication.

### ORAL COMMUNICATION

Oral communication skills of all students will be assessed in the semester in which they pass the technical Qualifying Examination. Assessment will be either satisfactory or deficient. All students judged to be deficient will be required to take a speech communication course and pass it with a grade of B or better prior to taking the Comprehensive Exam.

Each student will prepare and deliver a seven-minute (maximum) presentation whose subject area is in one of the standard topics that constitute the Qualifying Exam. The audience for the presentation will be two faculty evaluators, in addition to other Ph.D. candidates making their presentations. Following the presentation, the examining committee may ask questions. The student's adviser may observe the presentation, but may not ask or answer questions.

The topic for the presentation is up to the student. It is the ability to communicate, not the technical content of the talk, that will be evaluated. Therefore, it is in the student's best interest to pick a topic with which they are familiar. For example, topic areas may be from research, classes, etc.

### WRITTEN COMMUNICATION

Written communication skills of all students will be assessed in the semester in which they pass the technical Qualifying Examination. Assessment will be either satisfactory or deficient. All students judged to be deficient will be required to take a technical writing course and pass it with a grade of B or better prior to taking the Comprehensive Exam.

During a three-hour period, the student will be asked to read a short article related to an area of general interest in engineering. The student may be asked to answer a few short questions related to the article to ascertain his or her reading skills. The major portion of the assessment will be writing a response to a more general question related to the content of article. Anonymous evaluation will be performed by selected faculty members.