Graduate Programs Handbook

Department of Mechanical and Aerospace Engineering

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REVISIONS

- Aeronautical and Astronautical Engineering program references changed to Aerospace Engineering throughout the handbook to correspond with official program name change.
- Graduate Student Milestone Notification form renamed to Graduate Program Management form throughout the handbook.
- **Section 1.1** - Added clarifier regarding funding availability that states all students who are recommended for admission are automatically eligible for funding consideration.
- **Section 1.2** - Application deadlines updated to reflect new deadlines.
- **Section 1.3** - University admission criteria updated to match requirements outlined in the Graduate School Handbook
- **Section 1.4** – GRE requirement updated to reflect OSU MAE students with 3.5 GPA or better are exempted from the requirement. Also included a footnote noting the waiving of the GRE requirement for the Autumn 2021 and Spring 2022 application cycles due to the COVID-19 pandemic.
- **Section 1.5** – Increased the amount of non-degree coursework a student can count towards a degree program from 7 to 10 hours, consistent with University policy.
- **Section 1.6** – clarified policy for students transferring from a PhD program outside of OSU to OSU
- **Section 2.1** – Information related to part-time study has been further defined and guidance provided for any student considering that option. Added information about the possibility of a reduced course load request for international students. Reactivation process revised.
- **Section 2.4** – Adding information detailing that ESL courses do not count toward degree requirements or a student's GPA.
- **Section 2.5** – Revised minimum grade requirement to show that a C or better is required for any courses completed after Summer 2018.
- **Section 3.1** – Clarified advising duties of M and P-status faculty. Added more detailed information pertaining to primary and co-advising relationships. A justification is now required when students change an advisor. Further detailed procedure for changing advisors including situations where a student is a GRA. Outlined ramifications on research usage when changing advisors
- **Section 3.2** – Clarified process for students who wish to change from MS to PhD indicating that such transfers require a P-status faculty member at the time of request or the student will be treated as a new applicant to the PhD program and the request will be reviewed as such.
- **Section 3.5** – Grievance policy added.
- **Section 4.3** – Provided clearer statement on advising status requirements for committee members. Graduation process revised to reflect new internal deadlines.
- **Section 4.4** – Included information about the departmental survey evaluating a student after completing the MS exam for purposes of program assessment.
- **Section 4.5** – Revised steps for students to continue onto a PhD after completing a MS degree based upon multiple factors.
- **Section 5.1** – Amended AE program requirements to indicate seminar required every semester until graduation. Amended ME program requirements to indicate seminar required every semester until graduation. Added language indicating journal submission is not required for students before Autumn 2018.
- **Section 5.2** - Stats Qualifying Exam added as possible alternative to Math Qualifying Exam requirement. Registration requirements for students who started before Autumn 2018 removed. Statistics exam content added. Details on the contents of the oral exam clarified to reflect exam only covers material consistent with the written exam.
- **Section 5.4** – Revised Candidacy Eligibility policy to reflect a student who fails the exam has a maximum 18 months to retake the CE now. Eligibility policy also reflects that two failed CE exams will result in the student not being able to complete a PhD at OSU in any program, consistent with GS policy. Revised Candidacy Examination Committee policy to now reflect at least two of the members on the CE Committee must hold P-status in the Department of Mechanical and

Aerospace Engineering. Added language about the CE Committee Chair policy. Added that a GFR rep can be requested during the first attempt at CE upon request. The CE requirements and the procedure to schedule the CE has been revised. Retakes have been clarified such that a minimum of 4 months must pass to retake the exam and any retakes must be completed within a maximum of 18 months. The written CE has clearer details on the requirements and submission policy. The oral CE has been revised to provide clearer instructions on length and contents of the exam.

- **Section 5.5** – Clarified the definition of candidacy and the role of the Dissertation Committee. Revised Dissertation Committee policy to now reflect at least two of the members on the CE Committee must hold P-status in the Department of Mechanical and Aerospace Engineering. Moved Final Defense Pre-Approval process to section 5.6. Removed Final Defense Pre-approval options due to the implementation of the Doctoral Defense Authorization form.
- **Section 5.6** – Updated graduation process. Renamed Final Defense Pre-Approval form to the Doctoral Defense Authorization form. Included process in order to initiate Doctoral Defense Authorization form.
- **Section 6.1** – Combined degree admission policy added to combined degree information. Previously was included in Section I. Added a note about Math 4000+ courses being eligible to be counted for combined degree students in the case of MS students.
- **Appendix I** – Added ME 6665 to the list of approved Math courses

PREFACE

The *Graduate School Handbook* should be consulted for details regarding university rules and regulations relating to graduate students at The Ohio State University (Ohio State). The *Graduate School Handbook* can be located in its entirety on the Graduate School website: **https://gradsch.osu.edu/**. This handbook describes the policies and procedures relevant to the Department of Mechanical and Aerospace Engineering's (MAE) graduate programs at Ohio State in accordance to the policies outlined in the *Graduate School Handbook*.

The Department is home to three graduate programs: Aerospace Engineering (AE), Mechanical Engineering (ME) and Nuclear Engineering (NE). This handbook includes information pertaining to the academic and examination requirements for both the Master of Science (MS) and Doctor of Philosophy (PhD) degree paths in those three programs including the Qualifying Exams (QE) and Candidacy Exam (CE) when applicable. The MS and PhD program requirements that follow are set by the MAE Graduate Studies Committee (GSC) and consistent with the policies set by Graduate School at The Ohio State University.

We encourage both students and faculty to take the opportunity to review this handbook. Should any questions, comments or suggestions arise surrounding the content of this handbook, those requests can be addressed to the attention of the MAE GSC by way of the MAE Graduate Advising Office at **ENG-MAEGradProgram@osu.edu**.

SECTION 1 – ADMISSION

1.1 General Information

The MAE GSC oversees the review of all applicants to the department. Applications are only accepted for the autumn and spring semesters. Applicants must complete the online application (**http://apply.osu.edu/grad**) and submit *all* required application materials by the published application deadline for the semester in which they wish to apply. All students who is recommended for admission is automatically eligible for funding consideration.

Students whose backgrounds are not in engineering, physics, or chemistry should strongly investigate taking courses equivalent to Ohio State's core Undergraduate Mechanical Engineering or Aerospace Engineering courses before applying for admission to the graduate program.

1.2 Application Deadlines

The deadlines for admission are as follows:

Autumn semester – December 15
Spring semester – September 15

1.3 University Admission Criteria

The Graduate School requires applicants to submit documentation that demonstrates fulfillment of the following admission criteria or equivalent qualifications as outlined by the Graduate School (Section 2.2*, Graduate School Handbook*):

1. an earned baccalaureate or professional degree from an accredited college or university by the expected date of entry

2. a minimum of a 3.0 cumulative grade-point average (CGPA) (on the 4.0 scale used at this university) in the last degree relevant to the program of study earned by the applicant. For international students, the CGPA is calculated on the home institution's grading scheme and the grade key on the transcript is then utilized to approximate an equivalent US grade based on the educational system of that country. Applicants who have attended an institution with a grading scheme where a numerical CGPA cannot be calculated (e.g., narrative evaluation, satisfactory/unsatisfactory, etc.) will be required to be reviewed by the Graduate School.

3. prerequisite training that will enable the student to pursue the graduate program to which admission is sought

4. a minimum score of 79 on a valid internet-based Test of English as a Foreign Language (TOEFL-IBT) or 7.0 on the International English Language Testing System (IELTS). This requirement applies only to an applicant from a country where the first language is not English, unless a bachelor's degree or higher was earned in a country exempt from the English proficiency requirements. Residents of Puerto Rico and asylees in the United States for more than one year are also exempted from providing English language proficiency test scores.

5. Additional criteria published by the GSC of the local program

1.4 Program Specific Admission Criteria

In addition to the admission criteria set forth by the Graduate School, the MAE graduate programs require the following application materials:

1. One set of official transcripts from all undergraduate and graduate institutions attended[1]
2. A one to two-page statement of purpose
3. A one to two-page résumé
4. Three letters of recommendation
5. Official GRE scores are required of all applicants *except* those who are currently enrolled in the mechanical or aerospace engineering undergraduate programs at Ohio State with a cumulative GPA of 3.50 or better.[2,3]
6. At least one of the following scores is *preferred* if English is not your native language: 96 on the Internet-based (IBT) TOEFL or 7.5 on the International English Language Testing System (IELTS).
7. In cases where special conditions are imposed on admission, if these conditions are not met, the student may be dismissed from the program

1.5 TRANSFERRING WITHIN OHIO STATE

Students requesting to transfer internally from within one graduate program at Ohio State to either the ME, AE, or NE graduate programs will need to submit an Intra-University Transfer (IUT) application via the online application system (**http://apply.osu.edu/grad**). The student making the request will also need to submit a *Transfer of Graduate Program* form (available at **GRADFORMS**).

If the MAE GSC Chair approves the transfer, he or she will specify the admission classification and the courses already completed that will count toward the student's graduate degree program. The MAE GSC Chair must notify the Graduate School of the admission classification and courses to count prior to the effective semester of transfer. Graduate School Fellowships do not automatically transfer with students who are approved for transfer into a different graduate program, but such a request could be considered in extenuating circumstances. Qualifying Exam results and Candidacy Exam results do not transfer to a new graduate program.

Transferring Between MAE Graduate Programs. Students can request to change from one program in MAE to another, provided they have a valid reason for doing so. Such requests follow the same transfer process as outlined above. In addition to the IUT application and the Transfer of Graduate Program form, and providing the student is in good academic standing within MAE, a letter of support from the person serving as the faculty advisor in the new program in MAE is required to initiate a transfer request.

Students who request to transfer internally within MAE and are unable to provide a letter of support from a faculty advisor will be viewed as a new applicant to the graduate program in which they are seeking admission and they will be required to submit a statement of purpose, valid GRE scores

[1] Students who earned their undergraduate degree from Ohio State are not required to obtain official transcripts for their completed coursework here as it will be obtained through internal processes once an application is submitted. If a student transferred into Ohio State or has taken any classes for undergraduate or graduate credit from a different university, a transcript for each institution attended, aside from Ohio State, must be received directly by Ohio State's Graduate Admissions Office in order to be eligible for admission consideration.

[2] Students enrolled at Ohio State but not in the mechanical or aerospace engineering programs are required to provide GRE scores.

[3] Due to the COVID-19 pandemic, the Department has decided to waive the GRE requirement for all applicants for the Autumn 2021 and Spring 2022 semesters.

(taken within the last 5 years) and three letters of recommendation before their transfer request will be reviewed.

Interdepartmental Transfer Requests. Students requesting to transfer from a graduate program outside of MAE into the ME, AE, or NE graduate program will be viewed as a new applicant to the graduate program in which they are seeking admission and they will be required to submit a statement of purpose, valid GRE scores (taken within the last 5 years) and three letters of recommendation before their transfer request will be reviewed.

Graduate Non-Degree Credit Transfer Requests. If a graduate non-degree student is admitted to a graduate degree program, no more than seven (10) hours of semester graduate credit accumulated while in this non-degree classification may be counted toward the graduate degree (Section 2.4*, Graduate School Handbook*). Students requesting to transfer credit from courses they have completed as part of the Graduate Non-Degree Program at Ohio State must submit a Transfer of Graduate Credit form (available at **GRADFORMS**) within their first semester of enrollment in their degree seeking program. Non-Degree credit transfer requests are subject to review and approval of the MAE GSC Chair and the Graduate School.

1. 6 TRANSFERRING FROM OUTSIDE OF OHIO STATE

Students requesting to transfer from a graduate program at an institution other than OSU will need to submit an application via the online application system (**http://apply.osu.edu/grad**). The applicant seeking the transfer will need to submit all the required application materials (sections 1.3 and 1.4).

Students requesting to transfer any credit from another institution to Ohio State must submit a Transfer of Graduate Credit form (available at **GRADFORMS**). If a student is pursuing a Doctoral degree at Ohio State and has received a master's degree at another institution it must be transferred to Ohio State (Section 7.1*, Graduate School Handbook*). Any request to transfer credit hours into Ohio State should be completed within the student's first semester of enrollment in their program. All credit transfer requests are subject to review and approval of the MAE GSC Chair and the Graduate School.

Transferring Course Credit into a MS program. Students requesting to transfer credit into a MS degree program in MAE must complete 80% of the MS course work at Ohio State. As such, MS students can transfer a maximum of 6 hours of course credits from another university. The courses transferred must have been taken as a graduate student, must be designated as graduate courses and be identified on the transcript as such. A grade of at least a B must have been earned for the course credit to be transferred and used to fulfill a MS degree requirement.

Transferring Course Credit into a PhD program. Students requesting to transfer credit completed from a PhD program at another university, either individually or who have been recruited to work with a current Ohio State faculty member, are allowed to transfer a maximum of 9 credit hours of letter graded graduate course credit to the PhD program at Ohio State. Students requesting to transfer credit from a PhD program at another university and who are entering with a new Ohio State Faculty Member are eligible to transfer all their previous graduate coursework. Any student transferring from a PhD program from another institution to one of the MAE programs will be required to meet the following:

- A minimum of 24 credit hours must be completed at Ohio State
- A minimum of 80 credit hours total, including any transferred credit
- At least one letter-graded course must be completed at Ohio State to establish a GPA prior to attempting the Candidacy Exam
- All program requirements must be met via transferred coursework, coursework at Ohio State or a combination of the two
- Qualifying Exam must be taken at Ohio State

    - If the student has completed the Qualifying Exams at another university a petition can be submitted requesting exemption from the OSU MAE Qualifying Exams. The petition must include documentation from the previous institution showing successful completion of the Qualifying Exams.
- Candidacy Exam must be taken at Ohio State

SECTION 2 – REGISTRATION AND ACADEMIC REQUIREMENTS

2.1 MINIMUM REGISTRATION REQUIREMENTS

Students are expected to register every semester they are pursuing a graduate degree in MAE at Ohio State. The minimum registration requirements per semester, including the program specific seminar (if applicable) and research credits to be considered full-time, are as follows:

1. Eight (8) credit hours during the autumn and spring semesters is required to be full-time for the following student populations:

    - U.S. citizens,
    - Permanent residents,
    - International students, or
    - Students holding a 50 percent Graduate Associate position

2. Twelve (12) credit hours during the autumn and spring semesters is required to be full-time for all Fellowship (i.e., university fellowships or other fellowships and scholarships) and GRA-GS Match students.

3. Three (3) credit hours is required to be full-time for PhD students during the autumn and spring semesters following admission to Candidacy (i.e. passed the Candidacy Exam).

Summer Registration. Enrollment in the Summer term is optional except in instances where the student is planning to graduate in which case three (3) credit hours is the minimum number of hours required in order to graduate. Four (4) credit hours is required to be full-time for students who hold a 50 percent Graduate Associate position, a Summer Fee Authorization or who are self-supporting. Six (6) credit hours is considered full-time for Fellowship students and GRA-GS Match students.

Part-time Study. Students who enrolled but who are not full-time students (i.e. those who do not satisfy any of the enrollment criteria outlined above) would be considered a part-time student. Any student considering part-time study should discuss their plans with the MAE Graduate Advising Office and their faculty advisor so they understand any potential consequences or issues they may face as a result of part-time study.

Reduced Course Load for International Students. In special circumstances, international students can request and be granted a reduced course load status in consultation with the MAE Graduate Advising Office, their faculty advisor and the Office of International Affairs (OIA). This option is primarily reserved for, but not limited to, students who are not GA's or Fellows and who may not need a full-time load in their graduating semester. Any international student considering a reduced course load should first check with OIA for information on the procedures and restrictions for making such a request.

Graduation Semester Registration. Three (3) credit hours is the minimum number of hours required in the expected semester of graduation, however any student who is appointed as a GA, Fellow or GRA-GS Match will need to satisfy the full-time enrollment requirements consistent with their appointment to maintain their appointment and benefits.

Failure to Enroll. Students who fail to enroll in each semester (except for summer term, where enrollment is optional) will lose the ability to register for future semesters and they will be placed on a leave of absence by the university. Students placed on a leave of absence by the university will not be able to enroll until they have sought to be reactivated.

Reactivation. Enrollment eligibility is removed from students who do not enroll for a full semester.

They cannot register without first having that eligibility reactivated. Students wanting to reactivate their enrollment eligibility must submit the Permission to **Reactivate Enrollment Eligibility form** to the Graduate School.

Enrollment eligibility is automatically deactivated for master's degree students or pre-candidacy doctoral students who have not registered in the Graduate School within the preceding two full calendar years. Students who have not enrolled for two calendar years must have their reactivation approved by their Graduate Studies Committee chair. As part of their reactivation process students who have been gone more than two years are required to submit a tentative plan for degree completion to their faculty advisor and obtain their faculty advisor's concurrence. That plan should be submitted to the MAE Graduate Advising Office before submitting the reactivation form. This is to ensure both student and advisor are on the same page in seeing the degree through to completion.

2.2 Maximum Registration Allowed

The maximum number of hours permitted by the Registrar's Office is 18 credit hours per semester or 12 credit hours in summer term.

2.3 Reasonable Progress

To be in good academic standing in the Graduate School, a student must maintain a cumulative point-hour ratio (CPHR) of 3.0 or higher in all graduate credit courses and must maintain reasonable progress toward the degree requirements, including research activities.

Examples of a lack of reasonable progress include but are not limited to:

- Not meeting any departmental conditions placed upon you.
- Changing faculty advisors more than twice over the course of your current degree plan.
- Receiving a "U" in any research credits for which you are enrolled.
- Failure of all three individual subject exams on the first Qualifying Exam (QE) attempt (*ME and AE students only*).
- Two unsatisfactory attempts at passing the QE's (*all PhD students*)
- Two unsatisfactory attempts at the candidacy examination (Section 5.1, *Graduate School Handbook)*.
- Two unsatisfactory attempts at the final oral examination (Section 5.1, *Graduate School Handbook)*; or
- Failure to submit a final, completed copy of one's dissertation within one semester of completing the final oral examination

Students can be cited for a lack of reasonable progress at any point if they are not making satisfactory progress toward their graduate degree. No student may be denied further registration in a graduate program without first being warned by the Graduate School that such action may take place. The Graduate School specifies the conditions the student must satisfy in order to demonstrate reasonable progress and to continue enrollment in the graduate program. Conditions consist of completion of course work or other requirements as approved by the GSC (Section 5.4, *Graduate School Handbook*). A student who has been warned that further registration in the

graduate program may be denied and who then satisfies the specified conditions is placed in good standing by the Graduate School.

Students who are deemed to not be in good academic standing can have their registration in future semesters blocked and could be subject to dismissal from their graduate program per Graduate School rules (Section 5.4, *Graduate School Handbook)*.

2.4 Courses for Graduate Credit

Courses that count for graduate credit must be 5000-level and above with one exception; 4000-level courses outside of the students' own program can count for graduate credit but they must be designated by the Graduate School as approved for graduate credit and approved by the students' faculty advisor. No courses 3000-level or below and no 4000-level courses or below in the student's own program may be counted for graduate credit. In addition, the following ESL courses do not count as graduate coursework and do not count towards a student's GPA: EDUTL 5901, 5902, 5050, or 5060. A complete course catalog and schedule of classes can be found online at **www.buckeyelink.osu.edu**.

2.5 Minimum Grade Requirement

For courses completed after Summer 2018 must earn a grade of C or better for it to be used to satisfy their program's course requirements. While a course in which a grade of C- or lower is earned will not fulfill a MAE program requirement, the course grade will be calculated in the student's CPHR and will appear on the student's transcript.

2.6 Code of Student Conduct

Students are expected to abide by the Code of Student Conduct while they are pursuing a graduate degree in the Department of Mechanical and Aerospace Engineering. The Code of Student Conduct can be found in its entirety at **https://studentlife.osu.edu/csc/**.

SECTION 3 – ADVISING

3.1 FACULTY ADVISOR FUNCTIONS AND SELECTION

Selecting a faculty advisor is probably one of the single most important decisions students will make during their graduate career. Faculty advisors will assist the student in planning their graduate degree program. It is important that students take their time when choosing their advisor because he or she will be a key component in the student's success at the graduate level. Faculty advisors will approve, supervise, and evaluate individual work performed by a student to fulfill the requirements for a MS Thesis, MS Non-Thesis, or a PhD. Faculty advisors will also assist a student in planning for their required degree examinations. It is the joint responsibility of an advisor and a student to complete a degree program in a reasonable period.

It is important to be aware that master's and doctoral students have different criteria when selecting an advisor and those criteria are as follows:

- ***Master's advising status*** – Faculty must hold membership at the **Category M (M-status)** level or higher in the student's graduate program. M-status faculty can advise/co-advise master's students and co-advise doctoral students.

- ***Doctoral advising status*** – Faculty must hold membership at the **Category P (P-status)** level in the student's graduate program. P-status faculty can advise/co-advise both master's and doctoral students.

The Graduate School sets the minimum qualifications for faculty to hold advising status in a program (Section 12.4, *Graduate School Handbook*) however advising status is granted at the discretion of the individual programs. In addition to the faculty whose home unit is MAE, students can seek a faculty advisor outside of the MAE department. Students or faculty interested in this option should consult with the MAE Graduate Advising Office.

Students are strongly encouraged to choose an advisor, through mutual consent, as soon as possible. Students are required to select an advisor and notify the MAE Graduate Advising Office of their advisor by the end of their second semester of enrollment in the graduate program. If an advisor has not been selected by the end of the student's first two semesters of graduate study, the student can be denied from further registration until an advisor has been selected.

Once a faculty advisor has been selected, students must report their faculty advisor to the MAE Graduate Advising Office via the *Graduate Program Management* form (**https://go.osu.edu/maegpmanagementform)**. Faculty advisors will be required to confirm their status as the student's advisor before that information will officially be added to the student's record.[1]

Primary and Co-Advisors. The primary advisor is the graduate faculty member who will serve as the advisor of record for the graduate student and the point of contact with the Graduate School and is listed on **GRADFORMS**. He/she will be responsible for the coordination of the graduate program of the student (Section 12.1, *Graduate School Handbook)*. The primary advisor must hold P-status in the student's home program. In addition to serving as the main point of contact for the Graduate School, primary advisors will also be responsible for Qualifying Exam selection for the student and overseeing the Candidacy Exam process including identification of the Candidacy Exam chair.

[1] Students who secure an advisor at the time of their admission are not required to submit the *Graduate Student Milestone Notification* as that information will be added to their student record at the start of their first semester in their graduate program.

The co-advisor is an optional graduate faculty member who assists the primary advisor in coordination of the graduate program of the student and is listed on **GRADFORMS**. In circumstances where the primary advisor is no longer at the university, the co-advisor will become the point of contact with the Graduate School (Section 12.1, *Graduate School Handbook).* Co-advisors can hold M or P-status.

Changing Faculty Advisors. Once a faculty advisor has been reported to the MAE Graduate Advising Office, students who wish to change their advisor will be required to submit a new *Graduate Program Management* form identifying the former advisor and the new advisor along with a justification for the change. The change will be processed once the new advisor confirms their status as the student's new advisor.

If the student is a Graduate Research Assistant (GRA), they should consult with the faculty member they are leaving regarding the status of their appointment. If a student chooses to change faculty advisor's mid-semester, they are expected to complete any requirements that coincide with their GRA position for the remainder of the semester or discuss plans to terminate the position. Students who choose to terminate a GRA mid-semester would be expected to pay back any tuition and fees paid for the current semester to that point unless they will be moving to a GRA position with another faculty advisor.

In instances where a faculty member no long wishes to advise a student, they should inform the MAE Graduate Advising Office and student in writing of their decision. The MAE Graduate Advising Office will then discuss the decision with the student along with their next steps.

Students who change faculty advisors are advised that they may not be able to continue using their research up to that point with their new advisor. If the advisor is the Primary Investigator for a project and the student was a GRA on the project, the advisor has the right to state what data can be used towards their work with a new advisor. Students who change advisors may need to start over on a new topic. In cases where data and results are published or presented at a conference and they are openly available, then students could use such information with appropriate credit to the former faculty advisor. Any data or results that were not acquired as a GRA or that are unrelated to a sponsored project could continue to be used by the student. Students should work with their former faculty advisor to find an equitable solution with regards to research ownership and publishing. In the event an equitable solution is not found between the student and former faculty advisor, either party can request review of the situation by submitting a request to the MAE GSC Chair.

Any student who changes their faculty advisor more than two times over the course of their current degree plan will be prohibited from further enrollment due to a lack of academic progress. In order to continue enrollment, students will need to meet with the MAE GSC Chair to discuss their continued enrollment in the program. Students can seek reinstatement after a plan for finishing the intended degree is provided in writing and they have received approval from the GSC Chair to re-enroll.

3.2 Requests to Change Degree Level

Students can request to change their intended graduate degree level (MS → PhD *or* PhD → MS) in AE, ME or NE at any point during their graduate studies. Students who wish to change their degree level in their current program must have an advisor on record and they must submit a change in degree level request via the *Graduate Program Management* form (**https://go.osu.edu/maegpmanagementform**). For changing from PhD to MS, faculty advisor approval is not required, however the advisor will be notified. Student's should consult with the MAE Graduate Advising Office to determine if there are other implications to making this change, particularly if they are a GRA or GTA. For changing from MS to PhD, the student must have a faculty member with P advising status who agrees to be their primary advisor for the PhD. If a

faculty advisor is not found, the student must reapply to the department for consideration as a PhD applicant.

3.3 PETITIONS

Special requests with regards to any AE, ME or NE requirements will be considered when initiated by the student via petition. Students seeking to submit a petition can do so via the *Graduate Program Management* form (**https://go.osu.edu/maegpmanagementform**). The student's faculty advisor will be required to provide a brief statement of support for the petition before any such requests will be considered. Both the student and the faculty advisor will be notified of the result of the petition when a decision is available.

3.4 GRADUATE STUDENT EVALUATIONS

All students are required to complete a *Graduate Student Evaluation* form annually with their faculty advisor and co-advisor (if applicable). Students who do not have a faculty advisor at the time the evaluations are due are required to meet with the MAE Graduate Advising Office and acquire a graduate academic advisor's approval prior to submitting their evaluation.

Upon completing the evaluation, a copy must be submitted to the MAE Graduate Advising Office for the program and degree the student is currently pursuing by the end of the Spring semester each year they are enrolled in the program. The evaluation must be signed by both the student and the student's faculty advisor, co-advisor (when applicable) or graduate academic advisor (when applicable). Any student who does not agree with their annual evaluation can provide a rebuttal to their evaluation directly to the MAE Graduate Advising Office for their official student record.

3.5 GRADUATE STUDENT GRIEVANCES

University and department policy strongly encourage all students who believe they have a grievance to use all appropriate measures, which they are comfortable using, to reach a resolution before initiating a formal grievance. Students are encouraged to initially discuss the issue with the faculty or staff member with whom the problem has arisen, should they feel comfortable doing so. Should a student not resolve the grievance with the party in question or don't feel comfortable doing so, they can file a formal written grievance to the MAE Graduate Advising Office. If it is regarding a member of the MAE Graduate Advising Office, a grievance can be submitted to the MAE Associate Chair for Graduate Studies. The MAE Graduate Advising Office (or Associate Chair of Graduate Studies) will review the request and decide on a course of action in consultation with the student filing the grievance and any other appropriate parties to address the concerns raised. Students can also raise grievance issues to the MAE Department Chair in the event they are not satisfied with a resolution from the graduate program level. The MAE Department Chair will discuss the situation with the student and decide on a course of action with the student.

Should an issue not be resolved to a student's satisfaction locally, students can raise their grievance to the graduate and professional student ombudsman (**https://ombudsman.osu.edu/**) for further review and action.

All grievance issues raised are held in the utmost confidence. Such issues are afforded as much privacy as possible though the various parties involved, including those with whom a grievance is raised, may be involved in the process to help try to understand and resolve the issue.

SECTION 4 – MASTER OF SCIENCE DEGREE PROGRAMS

4.1 Master of Science Degree Requirements

In order to graduate with a Master of Science degree (MS) in AE, ME or NE, students must meet all requirements established by their respective program (as outlined in this handbook) and the University (Section 6.6, *Graduate School Handbook*) for the specific degree path they are pursuing. A minimum of 30 credit hours, including course work and a satisfactory thesis or non-thesis project is required to obtain a MS degree. The entire work for the MS degree must be completed within a period of six calendar years. The specific requirements for both the thesis and non-thesis paths are outlined in this section.

Aerospace Engineering	
Thesis	***Non-Thesis***

• 18 total hours of letter graded graduate courses
  ○ At least 3 hours must be 4000+ Math (except Math 4504), 5000+ Stats, or other program approved math equivalency courses
  ○ At least 9 hours must be 5000+ MAE courses
  ○ At least 6 hours must be 6000+ courses
• At least 12 hours of AE 8998 (*Graduate Research in Aerospace Engineering*)
• Satisfactory completion of a MS thesis document and oral thesis defense
• AE 8890 (*Aerospace Engineering Graduate Seminar*) every semester until graduation
	• 27 total hours of letter graded graduate courses
	  ○ At least 3 hours must be 4000+ Math (except Math 4504), 5000+ Stats, or other program approved math equivalency courses
	  ○ At least 12 hours must be 5000+ MAE courses
	  ○ At least 12 hours must be 6000+ courses
	• At least 3 hours of AE 8998 (*Graduate Research in Aerospace Engineering*)
	• Satisfactory completion of a Special Research Topic with final exam or report
	• AE 8890 (*Aerospace Engineering Graduate Seminar*) every semester until graduation

Mechanical Engineering	
Thesis	***Non-Thesis***

• 18 total hours of letter graded graduate courses
  ○ At least 3 hours must be 4000+ Math (except Math 4504), 5000+ Stats, or other program approved math equivalency courses
  ○ At least 9 hours must be 5000+ MAE courses
  ○ At least 6 hours must be 6000+ courses
• At least 12 hours of ME 8998 (*Graduate Research in Mechanical Engineering*)
• Satisfactory completion of a MS thesis document and oral thesis defense
• ME 8888 (*Mechanical Engineering Graduate Seminar*) every semester until graduation
	• 27 total hours of letter graded graduate courses
	  ○ At least 3 hours must be 4000+ Math (except Math 4504), 5000+ Stats, or other program approved math equivalency courses
	  ○ At least 12 hours must be 5000+ MAE courses
	  ○ At least 12 hours must be 6000+ courses
	• At least 3 hours of ME 8998 (*Graduate Research in Mechanical Engineering*)
	• Satisfactory completion of a Special Research Topic with final exam or report
	• ME 8888 (*Mechanical Engineering Graduate Seminar*) every semester until graduation

Nuclear Engineering	
Thesis	***Non-Thesis***

• Completion of the core NE courses
  ○ Math 4512 (*Partial Differential Equations for Sci. and Eng.)* or an equivalent course
  ○ NE 5606 (*Radiation Protection and Shielding)*
  ○ NE 5742 (*Nuclear Radiations and Their Measurements)*
  ○ NE 6536 (*Nuclear Reactor Systems and Analysis)*
  ○ NE 6708 (*Reactor Theory)*
  ○ NE 6725 (*Nuclear Reactor Dynamics)*
  ○ NE 6726 (*Reactor Dynamics Laboratory)*
  ○ NE 6766 (*Nuclear Engineering Design)*
• 3 hours of 5000+ NE coursework beyond the core courses
• Any remaining hours needed in order to reach the minimum of 30 graduate hours required by the Graduate School can be NE 8998 (*Graduate Research in Nuclear Engineering*) and/or additional graduate level coursework
• Satisfactory completion of a MS thesis document and oral thesis defense
• NE 6881 (*Nuclear Engineering Seminar*) every semester until graduation
	• Completion of the core NE courses
	  ○ Math 4512 (*Partial Differential Equations for Sci. and Eng.)* or an equivalent course
	  ○ NE 5606 (*Radiation Protection and Shielding)*
	  ○ NE 5742 (*Nuclear Radiations and Their Measurements)*
	  ○ NE 6536 (*Nuclear Reactor Systems and Analysis)*
	  ○ NE 6708 (*Reactor Theory)*
	  ○ NE 6725 (*Nuclear Reactor Dynamics)*
	  ○ NE 6726 (*Reactor Dynamics Laboratory)*
	  ○ NE 6766 (*Nuclear Engineering Design)*
	• 6 hours of 5000+ NE coursework beyond the core courses
	• Any remaining hours needed in order to reach the minimum of 30 graduate hours required by the Graduate School can be NE 8998 (*Graduate Research in Nuclear Engineering*) and/or additional graduate level coursework
	• Satisfactory completion of a Special Research Topic with final exam or report
	• NE 6881 (*Nuclear Engineering Seminar*) every semester until graduation

Mathematics Requirement. Any letter-graded Math course 4000+ (except Math 4504) or Stats course 5000+ or program approved Math course can be used to satisfy the mathematics requirement. Courses taken to fulfill the mathematics requirement cannot be used to satisfy the other letter graded graduate coursework requirements. A listing of suggested Math, Stats, or Math-equivalent courses can be found in Appendix I of this handbook.

6000-Level Coursework Requirement. Unless used for mathematics credit, 6000-level and above AE or ME courses can be used to fulfill the program specific course requirements for those programs and, at the same time, fulfill the 6000-level and above course requirement for students seeking a Master's degree. Students that use 6000-level and above courses to satisfy both the program specific course requirement and the 6000-level and above course requirement still must take enough approved graduate-level courses to fulfill the minimum amount of letter graded graduate coursework for their intended Master's degree.

NE Core Courses. Students who have completed the NE core courses or an equivalent course prior to joining the NE graduate program are not required to complete those courses again once enrolled as a graduate student in the NE graduate program at Ohio State. Students seeking an exemption from the NE core courses are required to submit a course plan to the MAE Graduate Advising Office showing how they plan to meet the minimum graduate credit hour requirement of 30 hours set by the Graduate School. In order to be acceptable to meet graduation requirements, the course plan must be approved by the student's faculty advisor, the Nuclear Engineering faculty, and the MAE GSC Chair.

4.2 CHOOSING THE THESIS OR NON-THESIS PATH

Thesis Path. The MS thesis path is intended for students who anticipate that research will be a major aspect of their career. It provides an opportunity to conduct independent research outside of the classroom under the able advisement of an expert in the field. The thesis path is ideal for students who plan to obtain a PhD at the completion of their MS.

Under the thesis path, an acceptable thesis must be submitted based upon individual research supervised by the student's faculty advisor. It is the student's responsibility to develop an acceptable research topic in consultation with his/her advisor. A final oral examination must also be passed. This examination will stress the thesis but may range over the academic work of the student.

Any student who is currently supported through the MAE Department via a graduate associate position (GRA, GTA, GAA, or GRA-GS Match) or any fellowship or scholarship that provides a fee authorization is expected to complete a thesis.

Non-Thesis Path. The MS non-thesis path is ideal for students who do not anticipate that research will be a major aspect of their career and do not plan to continue onto a PhD program. In addition to an increased number of courses required, the student must undertake a special project under the direction of their faculty advisor, leading to a final written exam or report. The final exam must be at least 4 hours long and the format could include a set of research problems, or a formal report on any topic acceptable to the student's advisor. An oral examination is optional and is at the discretion of the MS Examination Committee composed of two faculty with M-status.

Although not prohibited, students pursuing the non-thesis path should not expect to be supported as a GRA, GTA or fellow.

4.3 APPLYING TO GRADUATE

Students planning to graduate must submit both a *MAE Graduation Checkout* and an *Application to Graduate* in the semester they expect to graduate.

- *MAE Graduation Checkouts* (available at **https://go.osu.edu/maegpmanagementform**) must be submitted by **no later than the first Friday of the semester.**

- *Applications to Graduate* (available at **GRADFORMS**) must be submitted by **no later than the second Friday of the semester.**

MS Examination Committee. Students pursuing a MS degree must have a MS Examination Committee which consists of at least two members of the graduate faculty with M or P-status, one of whom will be the student's faculty advisor who will also serve as the chair of the committee. At least one of the members on the MS Examination Committee must have M or P-status in the student's graduate program (section 3.1). The MS Examination Committee must be reported at the time an *Application to Graduate* is submitted.

Additional committee members may be added to a master's Examination Committee at the discretion of the GSC Chair (Section 6.2*, Graduate School Handbook*) and should be listed on the *Application to Graduate*. In addition, non-OSU faculty committee members can serve on a master's Examination Committee as additional committee members. To add external members to the MS Committee, the student must initiate a *Committee and Examination Petition* (available at **GRADFORMS**) and include their name on the *Application to Graduate*. The request to add an external member to the MS Committee is subject to review by the student's faculty advisor and the GSC Chair. If approved, the petition is reviewed by the Graduate School for a final decision and the student will be notified of the result.

To make any changes to the membership of the MS Committee once the *Application to Graduate* has been submitted to the Graduate School, the student must initiate a *Committee and Examination Petition* (available at **GRADFORMS**). The request is subject to review by the student's faculty advisor and the GSC Chair. If approved, the petition is reviewed by the Graduate School for a final decision and the student will be notified of the result.

4.4 MASTER'S EXAMINATION

The Master's examination is a test of the student's knowledge of the field of Aerospace, Mechanical or Nuclear Engineering. It is the final validation of performance for the MS degree. The Master's examination is taken after submitting the *Application to Graduate* and during the semester in which the student plans to graduate. A student must be registered for at least three credit hours during the semester the master's examination is taken.

Thesis Option. Below are details regarding the master's examination for students pursuing the thesis option:

- The master's examination for a student pursuing the thesis option must include an oral portion and may include a written portion. The master's examination needs not be confined to the thesis topic.
- The oral portion of the master's examination emphasizes both an exposition and defense of the thesis investigation and a test of the candidate's knowledge of the course of study pursued.
- The examination is normally one hour in duration and should not exceed two hours.
- The examination must include a general presentation by the student, which is open to visitors, followed by the actual thesis defense, which is limited to the MS Examination Committee and the student.

Non-Thesis Option. Below are details regarding the master's examination for students pursuing the non-thesis option:

- The master's examination for a student pursuing the non-thesis option must include a written portion and may include an oral portion. The written portion may be in the form of an examination (in which case it should be at least four hours in length) or a substantial paper or project appropriate to the discipline and consistent with best practices in the field (Section 6.2, *Graduate School Handbook*).
- The oral portion, if selected, will test the range of the candidate's knowledge of the course of study pursued and may include a presentation of the results of the formal research paper. The oral portion must take place during announced university business hours, Monday through Friday.

Results of the master's Examination. The committee's decision on the master's examination, for both thesis and non-thesis students, is recorded on The Graduate School's *Report on Final Examination* form. Approval of the thesis is indicated on the *Report on Final Document* form. These forms are created after the student's *Application to Graduate* has been approved by the student's advisor, the MAE Graduate Advising Office and the Graduate School. These forms can be accessed by the advisor and OSU committee members at **GRADFORMS**. External committee members will be sent a link to access the report forms. In addition, all committee members will be

sent a departmental survey assessing the student in multiple areas for program assessment purposes. The MAE survey does not impact a student's graduation as it's for program assessment purposes only.

4.5 Pursuing a PhD After Completing a Master's Degree

Students have the option to continue onto a PhD after completing a master's degree, however the process for continuing can vary depending on certain factors. The process for continuing a PhD is detailed below. All students who wish to pursue a PhD and are seeking to be reactivated into a PhD program after completing a MS degree are subject to GSC Chair review.

- **Continuing immediately** - When submitting the *Graduation Checkout* students must indicate that they will be pursuing a PhD at Ohio State immediately following the completion of the MS degree. The faculty member who will serve as the student's primary advisor and has P-status in the doctoral program the student will be continuing their degree in will be asked to approve of the request. If the faculty member approves and agrees to be their advisor, the student will be admitted to the PhD degree in the same program as their MS degree for the semester immediately following the completion of their MS.

  If a student would like to pursue a doctoral degree in their current program but does not have a primary advisor with P-status to advise them, they will be treated as a new applicant to the PhD program. They are required to submit the following documents to be considered for admission to the doctoral degree:

  - A one to two-page statement of purpose
  - A one to two-page résumé
  - Three letters of recommendation

  Approval to continue onto the PhD program without a P-status faculty advisor is subject to the review of the GSC Chair. If recommended for admission to the doctoral degree, students will have two semesters to identify a P-status faculty member to serve as their faculty advisor consistent with program policy (section 3.1).

- **Graduated and continuing within a year** - If a student has been gone less than one year upon receiving a MS degree, he or she must request reactivation into the graduate program in order to pursue a PhD. In order to request reactivation, the student must submit the **Permission to Reactivate Enrollment Eligibility form**. In addition to the reactivation request, the student is also be required to provide a letter of support from the faculty member with whom they would like to pursue their PhD. If a student does not have a faculty advisor identified at the time of reactivation, they would need to provide the following documents to be considered for admission into the PhD program:

  - A one to two-page statement of purpose
  - A one to two-page résumé
  - Three letters of recommendation

- **Graduated and continuing after one year or more** - If a student has been gone more than one year upon receiving a MS degree, he or she must request reactivation into the graduate program in order to pursue a PhD. In order to request reactivation, the student must submit the **Permission to Reactivate Enrollment Eligibility form** and submit a **Graduate Intra-University Transfer application**. In addition to the reactivation form and the Graduate Intra-University Transfer application, the student is also be required to provide a letter of support from the faculty member with whom they would like to pursue their PhD. If a student does not have a faculty advisor identified at the time of reactivation,

they would need to provide the following documents to be considered for admission into the PhD program:

- A one to two-page statement of purpose
- A one to two-page résumé
- Three letters of recommendation
- Official GRE scores[1]

- **Graduated through a company partnership** - Students who graduate with a MS degree and who were admitted as part of a company partnership (GE, Honda, etc.) and are no longer supported by that company and plan to pursue a PhD must submit the following documents to be eligible to pursue a PhD:

  - A one to two-page statement of purpose
  - A one to two-page résumé
  - Three letters of recommendation
  - Official GRE scores
  - If the student was not enrolled in the previous semester, he or she must complete a reactivation form and submit it to the MAE Graduate Advising Office.

[1] GRE scores are only required if your current scores are not valid. GRE scores are valid for five years from the date of exam.

SECTION 5 – DOCTORAL DEGREE PROGRAMS

5.1 DOCTORAL DEGREE REQUIREMENTS

In order to graduate with a Doctoral degree (PhD) in AE, ME or NE, students must meet all requirements established by their respective program (as outlined in this handbook) and the University (Section 7.13*, Graduate School Handbook*) for the specific degree path they are pursuing. There are two potential paths for students pursuing a PhD: a BS-PhD path and a MS-PhD path. Students on the BS-PhD path begin work toward a Doctoral degree directly after receiving a baccalaureate degree and acceptance as a PhD student. Students on the MS-PhD path begin work toward a Doctoral degree after receiving a master's degree. [1]

A minimum of 80 graduate credit hours beyond the baccalaureate degree, including coursework and a dissertation, are required to obtain a Doctoral degree in the AE, ME or NE graduate programs. If a student has obtained a master's degree at Ohio State or elsewhere, then a minimum of 50 graduate credit hours beyond the master's is required. If a student is pursuing a Doctoral degree at Ohio State and has received a master's degree at another institution it must be transferred to Ohio State (Section 7.1, *Graduate School Handbook*). The entire work for the PhD degree must be completed within a period of nine calendar years. The specific requirements for both the BS-PhD and MS-PhD paths are outlined in this section.

Aerospace Engineering	
BS-PhD	***MS-PhD***

• 30 total hours of 5000+ letter graded graduate courses
  ○ At least 3 hours must be 5000+ Math, Stats, or other program approved math equivalency courses
  ○ At least 18 hours must be 6000+ courses and at least 9 of those hours must be MAE courses
• At least 50 hours of AE 8999 (*Aerospace Engineering Research for Dissertation*) with your faculty advisor
• AE 8890 (*Aerospace Engineering Graduate Seminar*) every semester until graduation
• First author journal submission
	• 18 total hours of 5000+ letter graded graduate courses
	  ○ At least 3 hours must be Math, Stats, or other program approved math equivalency courses
	  ○ At least 9 hours must be 6000+ MAE courses
	  ○ OSU MAE MS graduates can double-count to 2 courses from their MS degree toward their PhD coursework requirements.
	• At least 32 hours of AE 8999 (*Aerospace Engineering Research for Dissertation*) with your faculty advisor
	• AE 8890 (Aerospace Engineering Graduate Seminar) every semester until graduation
	• First author journal submission

[1] A student who starts on the BS-PhD path and later decides stop pursuing a PhD can apply all previously completed coursework toward a master's degree.

Mechanical Engineering

BS-PhD	***MS-PhD***

• 30 total hours of 5000+ letter graded graduate courses
  ○ At least 3 hours must be 5000+ Math, Stats, or other program approved math equivalency courses
  ○ At least 18 hours must be 6000+ courses and at least 9 of those hours must be MAE courses
• At least 50 hours of ME 8999 (*Mechanical Engineering Research for Dissertation*) with your faculty advisor
• ME 8888 (*Mechanical Engineering Graduate Seminar*) every semester until graduation
• First author journal submission
	• 18 total hours of 5000+ letter graded graduate courses
	  ○ At least 3 hours must be Math, Stats, or other program approved math equivalency courses
	  ○ At least 9 hours must be 6000+ MAE courses
	  ○ OSU MAE MS graduates can double-count to 2 courses from their MS degree toward their PhD coursework requirements.
	• At least 32 hours of ME 8999 (*Mechanical Engineering Research for Dissertation*) with your faculty advisor
	• ME 8888 (*Mechanical Engineering Graduate Seminar*) every semester until graduation
	• First author journal submission

Nuclear Engineering

BS-PhD	***MS-PhD***

• Completion of the core NE courses
  ○ Math 4512 (*Partial Differential Equations for Sci. and Eng.)* or an equivalent course
  ○ NE 5606 (*Radiation Protection and Shielding)*
  ○ NE 5742 (*Nuclear Radiations and Their Measurements)*
  ○ NE 6536 (*Nuclear Reactor Systems and Analysis)*
  ○ NE 6708 (*Reactor Theory)*
  ○ NE 6725 (*Nuclear Reactor Dynamics)*
  ○ NE 6726 (*Reactor Dynamics Laboratory)*
  ○ NE 6766 (*Nuclear Engineering Design)*
  ○ NE 7865 (*Neutron Slowing Down and Thermalization*)
• Three additional nuclear engineering courses 5000-level or above are required
• Two additional Math courses *or* one Math *and* one Stats course 5000-level or above are required
• NE 8999 (*Nuclear Engineering Research for Dissertation*)
• NE 6881 (*Nuclear Engineering Seminar*) every semester until Candidacy
• First author journal submission
	• Completion of the core NE courses or equivalent coursework
	  ○ Math 4512 (*Partial Differential Equations for Sci. and Eng.)* or an equivalent course
	  ○ NE 5606 (*Radiation Protection and Shielding)*
	  ○ NE 5742 (*Nuclear Radiations and Their Measurements)*
	  ○ NE 6536 (*Nuclear Reactor Systems and Analysis)*
	  ○ NE 6708 (*Reactor Theory)*
	  ○ NE 6725 (*Nuclear Reactor Dynamics)*
	  ○ NE 6726 (*Reactor Dynamics Laboratory)*
	  ○ NE 6766 (*Nuclear Engineering Design)*
	  ○ NE 7865 (*Neutron Slowing Down and Thermalization*)
	• Two additional nuclear engineering courses 5000-level or above are required
	• Two additional Math courses *or* one Math *and* one Stats course 5000-level or above are required
	• NE 8999 (*Nuclear Engineering Research for Dissertation*)
	• NE 6881 (*Nuclear Engineering Seminar*) every semester until Candidacy
	• First author journal submission

Mathematics Requirement. Any letter-graded Math or Stats course 5000+ or program approved Math course can be used to satisfy the mathematics requirement. Courses taken to fulfill the mathematics requirement cannot be used to satisfy the other letter graded graduate coursework requirements. A listing of suggested Math, Stats, or Math-equivalent courses can be found in Appendix I of this handbook. Courses with a strong math component but not a part of the Math or Stats department can be considered via petition.

Journal submission. Students who started their PhD program Autumn 2018 and beyond must have one submitted, submission-ready, or accepted peer-reviewed first author journal publication by the time he or she applies to graduate. Students who started before Autumn 2018 are not required to have a first author journal submission by the time they plan to graduate, but it is strongly encouraged.

5.2 MAE QUALIFYING EXAMINATION

The objective of the MAE Qualifying Examination (QE) is to determine whether the student is qualified to enter or continue in the Doctoral Program. The examination requires a comprehensive and in-depth understanding of undergraduate-level engineering principles and their application. The QE is given twice a year and they are is administered by the faculty in the department. The committee for each subject is known as the QE Subject Committee and those members as designated by the MAE GSC.

Examiners in each subject area evaluate the performance of all students in that subject and grade their performance as satisfactory or unsatisfactory. Admission to, or continuation in, the PhD program is decided according to the following criteria:

1. A student must receive satisfactory grades in three subject areas to continue in or be admitted to the PhD Program.

2. A student who receives three unsatisfactory grades on their first attempt will be denied admission to, or further registration in, the PhD program.

3. If a student receives an unsatisfactory grade on two or fewer subject exams, at the next offering they will be required to retake the same number of QE subject exams for which they received an unsatisfactory grade. Students have the option to retake the same subject exams that they failed, or they can elect to take subject exams in different areas. Students can retake the QE for any failed subject exams after their initial QE deadline if they take the QE at the latest possible date for which they are eligible.

4. No student may attempt the QE more than two times. Any student who does not satisfactorily complete three subject exams within two QE attempts will be denied admittance to, or further registration in, the PhD program.

Registration. Students in AE or ME are required to take the QE in three subject areas. Each exam is a written three-hour exam. Students will be required to take the Math or Stats QE[2], one subject exam chosen by their faculty advisor and one subject exam that is the student's choice.

Students must have a minimum 3.0 GPA and a faculty advisor with P-status in MAE on record in order to attempt the QE's. Any student who does not have a minimum 3.0 GPA and/or a faculty advisor with P-status on record will not be allowed to attempt the QE's. If a student does not satisfy the minimum GPA requirement within their required time frame to take the QE's, then the QE's will be postponed for up to one academic year while the student focuses on improving their GPA. Once

[2] Students who receive an 'A' or 'A-' in ME 8518/AE 8802 or ME 6665 are exempted from the Math/Stats QE requirement. Students exempted from the Math or Stats QE will only need to take and pass two QE subjects.

the minimum GPA requirement has been met the student will be required to take the QE's at the next available offering. If a student does not meet the minimum GPA requirement within that one-year period, they will be denied further registration in the PhD program.

The timeline for QE registration is as follows:

- Students who are pursuing the BS-PhD path must take the QE by the fourth exam offering after enrolling in the PhD program.
- Students who pursuing the MS-PhD path must take the QE by the second exam offering after enrolling in the PhD program.
- Students who switch from an MS path to the BS-PhD path are required to take the QE as if they entered directly as a PhD student. That means they will have to take it by the fourth offering available based upon when they started at Ohio State or at the next available offering if they switch after their second year in the program.

If a student fails to register for and take the QE within the required time frame it will count as a failure of the QE and the student will forfeit one attempt of all three individual subject exams. The student must take and pass all three individual subject exams at the next offering or the student will be dismissed from the PhD program.

QE Subjects. The available QE subject areas for students in the AE and ME graduate programs are as follows:

- **AE Structures**: The examination will cover three main topics in aero structures: structural mechanics, structural dynamics, and energy methods.

- **Design**: The examination covers fundamentals of mechanical design; failure modes; stress analysis and failure prevention principles; design of mechanical elements.

- **Dynamics**: (registrants may only select *one* of the following)

    - **AE Dynamics, Systems, Control and Estimation**: Fundamentals of dynamic systems, translational and rotational motion, aircraft 6DOF dynamics, basic modern control theory, frequency methods, optimal control theory and basic estimation theory.

    - **ME Dynamics and Kinematics**: Dynamics of particles and rigid bodies; motion and force analysis of mechanisms.

- **Fluids** (registrants may only select *one* of the following)

    - **AE fluids**: Viscous flow (Navier-Stokes, boundary layers), 1-D compressible flow, potential flow

    - **ME fluids*:*** Integral balances; inviscid flows; viscous flows; turbulent flows; one-dimensional compressible flows.

- **Heat transfe**r**:** Heat conduction; convection; radiation; multimode heat transfer.

- **Math** (registrants may only select *one* of the following unless exempted)**:**

    - **Math:** Differential equations, linear algebra and a rudimentary understanding of applied probability

    - **Statistics:** Probability; point and interval estimations; reliability analysis

- **Measurements and controls:** Performance characteristics of motion, force, pressure, flow, and temperature transducers; data analysis; performance specifications for control systems; stability and error analysis techniques; controller concepts.

- **Mechanics of materials:** Static equilibrium analysis of simple structures and machines; stress-strain analysis of structural components under different load conditions; energy methods.

- **System dynamics and vibrations:** Dynamic response of mechanical, fluid, thermal, and electrical elements; mechanical vibrations; frequency response and transfer functions; analytical methods for linear systems.

- **Thermodynamics:** Conservation and balance principles; properties and property relations; nonreactive ideal-gas mixtures; combustion, thermochemistry, and chemical equilibrium.

Results. The QE Subject Committee reports each student's performance to the GSC Chair, who will communicate the results to the student and to the advisor. The decision on a student's qualifications to be admitted to, or continue in, the PhD Program is solely the responsibility of the GSC, which may take other factors into consideration.

If a student does not satisfactorily complete any QE subject exams on their first attempt or they do not satisfactorily complete three subject exams within two QE attempts, they will be denied admittance to, or further registration in, the PhD program.

Oral QE Process. The faculty advisor of any student who does not satisfactorily complete any QE subject exams on their first attempt or who does not satisfactorily complete three subject exams within two QE attempts may submit a petition to the GSC requesting that the student not be dismissed from the program. The petition must be submitted within 14 days of the results distribution. The GSC may deal with the petition by requiring the student, on whose behalf the petition was submitted, to undergo an oral examination (closed books, closed notes) on all subjects that were not passed satisfactorily during the most recent QE attempt. The following process is recommended:

- The Chair of the written subject exam in the area(s) the student failed shall request the examiners in those areas to serve on the oral exam committee. If any faculty members decline to serve on the oral exam committee, then the Chair of that area may ask other faculty members to replace him or her in the oral exam. The petitioning faculty member, advisors, or collaborators/likely committee members on the student's thesis must not participate in the oral exam in order to avoid a conflict of interest.

- The oral exam shall be held within one month after submission of the QE petition. The MAE Graduate Advising Office and Chair of the QE area(s) are responsible for scheduling and convening the oral exam committee. In case of a conflict of interest, the GSC Chair will replace the Chair of the QE subject exam(s) in this role.

- The oral exam may last up to, but not more than 1 hour, and will cover material consistent with the expectations on the written subject exam. The questions on the written QE may serve as a launch point for the oral exam.

- The oral exam committee shall consist of three voting faculty members, and a fourth non-voting faculty member from the GSC who, by authority of the GSC, shall make sure that the oral examination is conducted in a fair and appropriate manner.

- The oral examination committee members are not to discuss the student's performance on the oral exam during its administration or after its conclusion. They are to evaluate the student anonymously with a 0 (Unsatisfactory), or 2 (Satisfactory), on a ballot to be submitted immediately after the exam in respective envelopes delivered by the oral exam GSC Representative to the Graduate Program staff.

- Students must score 4/6 in order to pass the oral exam.

- The GSC Chair will notify the petitioner and student by email of the results of the oral exam. That notification will occur within 1 business day of the oral exam.

- Students undergoing the oral exam must pass every subject in which they are being examined, in order to remain in the program. If they fail any or all the oral exams, they are dismissed from the program. No further petitions on behalf of these students will be considered by the GSC.

5.3 NE QUALIFYING EXAMINATION

The NE Qualifying Examination (QE) covers the essential principles of nuclear engineering. The QE is offered once a year in the autumn semester and is administered by the faculty in the NE Graduate Program.

Examiners in each subject area evaluate the performance of all students in that subject and grade their performance as satisfactory or unsatisfactory. Admission to, or continuation in, the PhD program is decided according to the following criteria:

1. A student must receive satisfactory grades in all four subject areas to continue in or be admitted to the PhD Program.

2. A student with two or fewer sections with unsatisfactory grades must, at the next offering, retake only those parts of the examination on which an unsatisfactory grade was received.

3. A student with three or more sections with unsatisfactory grades must retake the entire examination at the next offering.

4. No student may attempt the QE more than two times. Any student who does not satisfactorily complete all four subject exams within two QE attempts will be denied admittance to, or further registration in, the PhD program.

The NE QE will be waived if the following criteria are met:

1. Completion of the core NE coursework with a minimum 3.0 GPA (B) average in that coursework, and

2. a minimum 3.90 GPA in 18 hours of letter-graded graduate level coursework.

Qualified PhD students, their faculty advisor, the NE program chair and assistant to the NE program will all be notified of all students exempted from the NE QE's by June 15 in order for the faculty and eligible students to properly prepare for the QE as needed.

Registration. PhD Students must take the NE QE's within the first two times it is offered to new exam takers. Students in NE are required to take the written exams in four subjects: three required topics and one specialty topic.

The available QE subject areas for students in the NE graduate program are as follows:

Required Topics

- **Reactor Physics and Engineering**
  - Covers material in NE 4505, NE 5708, NE 5725 and NE 5726
- **Radiation Physics (Radiation Protection/Health Physics), and Interaction with Matter (Detection, Instrumentation, Shielding)**
  - Covers material in NE 5606, NE 5742 and NE 5766
- **Thermodynamics, Fluid Flow and Heat Transfer**
  - Covers material in ME 4501 NE 7536 and NE 6766

Specialty Topics

- **Advanced Reactor Physics, Kinetics and Dynamics**
  - Covers material in NE 5708, NE 5725 and NE 5726
- **Fuel Cycle and Waste Management**
  - Covers material in NE 5766
- **Health Physics, Radiation Protection and Shielding**
  - Covers material in NE 5606 and NE 5742
- **Advanced Thermal Hydraulics**
  - Covers material in NE 6536, NE 6537, ME 6505 and ME 6510
- **Advanced Reactor Instrumentation and Control**
  - Covers material in NE 6725, NE 6726, NE 5742 and ME 3870
- **Advanced Topics in Safety and Risk Assessment**
  - Covers material in NE 5610, NE 5716 and NE 5717

Results. The NE QE Committee reports each student's performance to the GSC Chair, who will communicate the results to the student and to the advisor. The decision on a student's qualifications to be admitted to, or continue in, the PhD Program is solely the responsibility of the NE faculty committee, which may take other factors into consideration. Students who do not pass all four exams on their first attempt have the choice to retake the exams at one of two dates. Available dates to retake any required NE QE subject exams based upon the criteria outlined above will be provided at the time results are made available to the student and advisor.

5.4 CANDIDACY EXAMINATION

The Candidacy Examination (CE) is a single examination consisting of a written portion and an oral portion. The objective of this examination is to test the student's knowledge of the field and related areas of study, capacity to undertake independent research, and ability to think and express ideas clearly. Students are expected to graduate within five years of passing the Candidacy Exam.

Candidacy Eligibility. The CE must be taken within two years of passing the QE**.** Both the written and oral examinations, must be completed within a 60-day period and the student must be enrolled in at least 3 hours in any semester where a portion of the CE is being attempted. Students who do not take the CE within the timeframe above will be cited for a lack of reasonable progress for their intended degree and prohibited from further enrollment in their degree program.

If a student fails the CE, they cannot retake the CE until a minimum of 4 months has passed. This is to provide the student with ample time to prepare for any deficiencies identified in the first CE attempt by the committee. Retakes must be completed within a maximum of 18 months of the date the CE was initially taken. Failure to take the CE within that allotted time frame will result in the student being dismissed from the program. In addition, no student is permitted to take the CE more than twice per Graduate School policy. A second failed Candidacy Exam will result in dismissal form the PhD program and the student will not be eligible to pursue a PhD in another program at

Ohio State. Students who fail the CE twice can still pursue a master's degree in their program, if one hasn't already been earned, or a Master's in another program at Ohio State (Section 7.6*, Graduate School Handbook*).

In addition, if a student fails to submit the final copy of the dissertation to the Graduate School within five years of being admitted to candidacy, his or her candidacy is cancelled (Section 7.7*, Graduate School Handbook*). At least 30 days before the cancellation of his or her candidacy, the student may petition the Graduate School to obtain, at most, a one semester extension of the candidacy period. The student must initiate a *Committee and Examination Petition* (available at **GRADFORMS**) and he or she must provide a detailed plan to the MAE Graduate Advising Office for completing their degree in the following semester.

In the event a student's candidacy is cancelled, with the approval of the advisor and the GSC, the student may take a supplemental CE. The student is required to take the supplemental CE, including an updated written component and a new oral component, by the end of the semester immediately following the cancellation of his or her candidacy. Failure to take the supplemental CE within that allotted time frame will result in the student being dismissed from the program and no additional extensions will be granted.

If the student passes the supplemental CE, the student is readmitted to candidacy and must then complete a dissertation within two years. If the student fails to complete his or her dissertation by the end of this two-year period, he or she will be dismissed from the program and no additional extensions will be granted.

Candidacy Examination Committee. In consultation with their advisor, all students pursuing a PhD degree in the MAE department are required to select a CE Committee which must consist of their advisor and three or more graduate faculty members. At least two of the members on the CE Committee must hold P-status in the Department of Mechanical and Aerospace Engineering. One of the committee members must have MAE as their primary tenure-initiating unit (TIU). Students and their advisors will need to identify the Chair of the committee at the time the student reports the submission of the written CE. The chair of the committee must hold P-status in the student's home program and is responsible for coordinating and conducting the oral portion of the candidacy examination. It is suggested that Chair be someone of eligible status on the committee, other than the student's faculty advisor, though it is not required. In addition, while not required for first attempts at the CE, a Graduate Faculty Representative (GFR) of the Graduate School can be requested for first time examinees should the committee or student request their involvement. For second-time examinees, the Candidacy Examination Committee also requires a GFR of the Graduate School. The Graduate School will assign the GFR for first-time exams via special request and automatically in the case of second-time examinees. All members of the Candidacy Examination Committee, including the GFR (when applicable) are voting members.

Additional committee members may be added to a CE Committee at the discretion of the GSC Chair (Section 7.3*, Graduate School Handbook*). To add an external (non-OSU faculty) member to the CE Committee, the student must initiate a *Committee and Examination Petition* (available at **GRADFORMS**) at least four weeks before their planned Oral CE defense date. The request to add an external member to the CE Committee is subject to review by the student's faculty advisor and the GSC Chair. If approved, the petition is reviewed by the Graduate School for a final decision and the student will be notified of the result.

Students can change CE Committee members at any time prior to the submission of the *Application for Candidacy Examination* without penalty via the *Graduate Program Management* form (**https://go.osu.edu/maegpmanagementform**). Changes to the CE Committee are subject to review by the student's faculty advisor and the GSC Chair. To make any changes to the membership of the CE Committee after the *Application for Candidacy Examination* is submitted, the student must initiate a *Committee and Examination Petition* (available at **GRADFORMS**). The request is subject to review by the student's faculty advisor and the GSC Chair. If approved at the

departmental level, the petition is then reviewed by the Graduate School for a final decision and the student will be notified of the result.

Written Portion of the Candidacy Examination. The written portion of the CE will be administered and evaluated by the student's CE Committee and consists of a dissertation proposal to be submitted to the CE committee. The committee is free to specify any reasonable length of dissertation proposal it feels appropriate though the program recommends a document 10-15 pages long. If the proposal is longer than the 15 pages, a short document effectively summarizing the full proposal is expected to accompany the full proposal. The written CE must be submitted to all members of the CE Committee for evaluation. The proposal should be concise and precise and should include the following:

1. Title and abstract
2. Significance of the problem
3. Scope and objectives of the research
4. Literature review
5. Methodology
6. Expected results and conclusions
7. Expected contributions to the state of art or the literature

Students must report the submission of their written CE to the MAE Graduate Advising Office approximately 6 weeks before their planned Oral CE via the *Graduate Program Management* form (**https://go.osu.edu/maegpmanagementform**). The written CE must be unanimously approved by the entire CE committee before a student will be permitted to schedule and take the Oral CE.

Oral Portion of the Candidacy Examination. Like the written portion of the CE, the oral portion of the CE is also administered and evaluated by the student's CE Committee. It is normally held within one month of the written examination's approval. Students must submit the *Application for Candidacy Examination* (available at **GRADFORMS/**) approximately three weeks before their planned Oral CE date and only once their written CE has been accepted by their committee. The *Application for Candidacy* must be approved by the student's faculty advisor and the MAE Graduate Advising Office at least two weeks before the planned Oral CE date. Failure to have the Application for CE approved by all required parties by the deadline will require the student to resubmit the form such that they can satisfy the Graduate School's mandatory two-week deadline for such requests.

For the content of the Oral CE, the candidate should expect questions that probe for a comprehensive knowledge of the candidate's written CE, research area, and graduate coursework. The oral portion of the examination must consist of at least one hour of questioning of the student and cannot exceed two hours in length. The student shall make no formal or informal presentation during the examination period. Any use of prepared materials must be limited and only in response to a specific question. Oral presentation of any proposal or other prepared materials must be made prior to the oral examination. Questioning of the student should occupy the entire period of the examination. All committee members are expected to participate fully in the questioning during the examination and in the discussion of and decision on the result of the Candidacy Examination (Section 7.5*, Graduate School Handbook*).

Attendance at the oral portion of the Candidacy Examination is limited to the student and members of the Candidacy Examination Committee. Except when teleconferencing is involved, all members of the Candidacy Examination Committee must be present during the entire oral examination. One

committee member can videoconference into the examination without prior approval of the GSC or the Graduate School. If more than one person requests to videoconference into the presentation the student must initiate a *Committee and Examination Petition* (available at **GRADFORMS**) explaining why they are requesting additional members of the committee to videoconference into the examination. For additional guidelines pertaining to videoconferencing, please review the information provided by the Graduate School (Appendix B.1, *Graduate School Handbook*).

Result of the Candidacy Exam. The decision about the outcome of the CE is reached in the absence of the student. After discussion, the satisfactory/unsatisfactory decision is reached by means of a vote. Each examiner indicates judgment by posting their decision on the *Report on Candidacy Examination* form that must be submitted to the Graduate School (Section 7.6, *Graduate School Handbook*). That form will be available to the faculty committee members at **GRADFORMS**. External committee members will be sent a link via email to access the report form and report their decision.

In the event a student fails the CE on the first attempt, or their candidacy is cancelled, and a supplemental CE is required, the student can submit an *Application for Candidacy* once the written CE is approved unanimously by their CE Committee. The *Application for Candidacy* must be submitted and approved by the student's advisor and the GSC Chair at least two weeks before the scheduled oral defense per Graduate School policy. Students will need to provide a copy of the written portion of the CE to the Graduate Faculty Representative as soon as one has been assigned. In addition, the CE committee must remain the same as the first attempt, however a petition can be filed if changes are requested via the *Committee and Examination Petition* (available at **GRADFORMS**) along with a justification for the request and that must be submitted and approved prior to a new *Application for Candidacy* being submitted. A petition to change committee members is subject to advisor, GSC Chair and Graduate School review.

5.5 CANDIDACY

The Graduate School outlines the parameters of candidacy. This is commonly referred to as post-candidacy status within Ohio State. Students are bound to the policies outlined by the Graduate School and the program via the information that follows in order to maintain their candidacy status. In addition to the information that follows, students should review the *Graduate School Handbook* to make sure they understand all aspects of candidacy. Detailed information about candidacy can be found in section 7.7 of the *Graduate School Handbook*.

Dissertation Committee. Once a student has attained PhD candidacy, they are entering the final stages of their PhD. As such, MAE students are required to establish a dissertation committee, in consultation with their advisor, within one semester of successful completion of the CE. The role of the dissertation committee is to advise the student in the final stages of their PhD. The committee must consist of their advisor and two or more graduate faculty members, one of whom must be a tenure-track member of the MAE faculty. At least two of the members must hold P-status in the Department of Mechanical and Aerospace Engineering. External (non-OSU faculty) members can also serve on the committee but those members would be extra members in addition to the required number of faculty members (Section 7.9, *Graduate Studies Handbook*). The student must indicate which committee members, including any external members, who will be serving as the dissertation committee via the *Graduate Program Management* form (**https://go.osu.edu/maegpmanagementform**).

Students who have external committee members serving on their dissertation committee are also required to submit a *Committee and Examination Petition* (available at **GRADFORMS**) requesting the inclusion of any external committee members. The request to add an external member is subject to review by the student's faculty advisor and the GSC Chair. If approved, the petition is reviewed by the Graduate School for a final decision and the student will be notified of the result.

5.6 APPLYING TO GRADUATE

Any student planning to graduate must have an *Application to Graduate* approved by the MAE Graduate Advising Office, their faculty advisor and the Graduate School by no later than the third Friday of the semester they plan to graduate. For the MAE Graduate Advising Office to approve of an *Application to Graduate*, PhD students must receive unanimous approval on the *Doctoral Defense Authorization (DDA)* form from their dissertation committee. The purpose of the DDA is as follows:

1. Assess student readiness and that their research plans are on track for completion
2. Provide students with reasonable assurance as they seek employment/interview
3. Ensure that the journal manuscript (if required) has been or will be submitted by the time the student is expected to graduate.

In order to initiate the *DDA*, students must submit an *Application to Graduate* (available at **GRADFORMS**) and a *Graduation Checkout* (via **https://go.osu.edu/maegpmanagementform**) no later than one semester before they plan to graduate. The *DDA* form will be generated and sent to the student and their dissertation committee for completion upon receipt of those forms by the MAE Graduate Advising Office. The *DDA* form will require students to submit the following information:

- A copy of the student's current CV
- A tentative timeline of activities for the final semester (ex. date in which any research objectives should be finished, date by which format check is to be completed, date by which draft of dissertation submitted to committee, tentative week of defense, etc.)

Unanimous approval by the dissertation committee of the *DDA*, including any external members, will be required by no later than one week into the students planned graduation semester before the MAE Graduate Advising Office will approve of an *Application to Graduate*. An Application to Graduate will require the approval of both the student's faculty advisor and the MAE Graduate Advising Office before it will be processed by the Graduate School. If the *DDA* is not approved by the first Friday of the semester the student intends to graduate, the student's *Application to Graduate* will be denied and they will need to reapply for a future semester barring a petition to the GSC Chair.

Approval of the *DDA* and the *Application to Graduate* does not guarantee graduation in a given semester, only that the committee and advisor believes the student should be able to defend that semester barring any setbacks. If a student does not graduate in their intended semester, they must submit an explanation for the delay and new timeline to complete the degree in consultation with their committee to the MAE GSC Chair by no later than the end of the semester they are not graduating.

Before Your Final Examination. PhD students are required to submit an *Application for Final Exam* (available at **GRADFORMS**) and report their final examination information to the MAE Graduate Advising Office (via **https://go.osu.edu/maegpmanagementform**). Students will need to identify all members of their final oral examination at the time of form submission and the committee makeup should consist of the student's entire dissertation committee. The *Application for Final Exam* must be submitted by the student and approved by their committee no later than two weeks before the students scheduled final oral examination.[3]

[3] Students who will be holding their defense at the Center for Automotive Research (CAR) or the Aerospace Research Center (ARC) are required to have those forms submitted and approved by their committees no later than three weeks before the students scheduled final oral examination.

To make any changes to the membership of the dissertation committee once the *Application for Final Exam* has been submitted to the Graduate School, the student must initiate a *Committee and Examination Petition* (available at **GRADFORMS**) detailing any changes. The request is subject to review by the student's faculty advisor and the GSC Chair. If approved, the petition is reviewed by the Graduate School for a final decision and the student will be notified of the result.

Final Examination Preparation Guidelines. Below are some general guidelines to help students plan out the final weeks leading up to their final examination.

- Students should provide a completed draft copy of their dissertation to their advisor at least **6-7 weeks** before their defense.
- Students should provide a completed draft copy of their dissertation to their dissertation committee **4-5 weeks** before their defense.
- A physical, typed dissertation draft must be checked for proper formatting by the Graduate School at least two weeks before the defense.[4]
    - More information about the format check is available at **https://gradsch.osu.edu/completing-your-degree/dissertations-theses/document-preparation**.
- The *Application for Final Exam* form must be submitted by the student and approved by their committee no later than two weeks before the students scheduled final oral examination.
    - Students who will be holding their defense at the Center for Automotive Research (CAR) or the Aerospace Research Center (ARC) are required to have those forms submitted and approved by their committees no later than three weeks before the students scheduled final oral examination.
- Students must provide a completed draft copy of their dissertation to the Graduate School's Faculty Representative (GFR) as soon as one has been assigned.

The Final Oral Examination. The final oral examination is an oral examination that lasts approximately two hours. A presentation of the dissertation research by the student is allowable. At least one hour of the two-hour examination period, however, must be allotted to discussion of the research and to questions of and answers by the student from the dissertation committee (Section 7.9*, Graduate School Handbook*).

Attendance during the examination period is limited to the student and members of the dissertation committee. Except when teleconferencing is involved, all members of the dissertation committee and the GFR must be present during the entire oral examination. One committee member can videoconference into the examination without prior approval of the GSC or the Graduate School. If more than one person requests to videoconference into the presentation the student must initiate a *Committee and Examination Petition* (available at **GRADFORMS**) explaining why they are requesting additional members of the committee to videoconference into the examination. For additional guidelines pertaining to videoconferencing, please review the information provided by the Graduate School (Appendix B.1, *Graduate School Handbook*).

Result of the Final Oral Examination. The decision about the outcome of the final oral examination is reached in the absence of the student. After discussion, the satisfactory/ unsatisfactory decision is reached by means of a vote. Each examiner indicates judgment by posting their decision on the *Report on Final Examination* form that must be submitted to the

[4] The Graduate School will not approve of the *Application for Final Exam* if the formatting has not been checked.

Graduate School. This form can be accessed by the advisor and other dissertation committee members as well as the GFR at **GRADFORMS**. External committee members will be sent a link to access the report forms. The student is considered to have completed the final oral examination successfully only when the decision of the final oral examination committee is unanimously affirmative (Section 7.10*, Graduate School Handbook*).

Submission of the Final Copy of the Dissertation. Final approval of the student's dissertation cannot occur until the final oral examination has been completed satisfactorily. Students are expected to submit the final copy of their dissertation to the Graduate School in the same semester in which they have successfully completed their final oral examination. Each dissertation committee member indicates approval by posting their decision on the *Report on Final Document* form that must be submitted to the Graduate School by the published deadline for the semester or summer term of graduation (Section 7.11*, Graduate School Handbook*). This form can be accessed by the advisor and OSU committee members and GFR at **GRADFORMS**. External committee members will be sent a link to access the report forms.

Final Defense and Dissertation Submission Time Limits. In exceptional circumstances students can seek a one semester extension to complete their dissertation. Students must have satisfactorily passed the final oral examination and they must submit a statement, signed by their advisor and dissertation committee indicating the reason the dissertation was not completed during the same semester and when the final dissertation is expected to be ready. Students will have to enroll as a full-time student any semester in which they are finishing their dissertation. Failure to submit a final copy of the dissertation within one semester of completing their final oral examination will result in the student being cited for a lack of reasonable progress (section 2.3).

Any student who has not completed both the dissertation and final oral examination within four calendar years after the Candidacy Examination must submit documentation of the progress to date, the work remaining, and a schedule to the dissertation committee. This document must be approved by the dissertation committee and forwarded to the GSC for action.

If a student fails to successfully complete the final oral examination and submit the final copy of the dissertation document to the Graduate School within five years of being admitted to candidacy, they will have their candidacy cancelled per Graduate School rules. In such a case, with the approval of the advisor and the Graduate Studies Committee, the student may take a supplemental candidacy examination. If the student passes this supplemental candidacy examination, the student is readmitted to candidacy and must then complete a dissertation document within two years (Section 7.7, *Graduate School Handbook*). Students who do not complete the requirements above within the timeframe will be dismissed from the program.

SECTION 6 – SPECIALTY PROGRAMS

6.1 COMBINED DEGREE PROGRAM

The purpose of the combined program is to give exceptional Ohio State undergraduate students an opportunity to double-count up to two courses of their required undergraduate technical elective coursework toward the coursework requirements for a MS or PhD in AE, ME or NE.

Program Eligibility. Students who have earned at least 90 cumulative semester hours and are currently enrolled in either the AE or ME undergraduate program or other engineering related disciplines, and have a cumulative grade-point average of 3.50 or higher in all previous undergraduate coursework, may apply. Undergraduate students from related disciplines are encouraged to apply for admission. Admission in such cases will be reviewed on a case-by-case basis.

Combined Degree Admission. Students applying to the combined degree program must satisfy all the department's application requirements (section 1.3) and the following program requirements:

1. Submit a *Combined Degree* form (available at **https://gradforms.osu.edu/grad-forms/form/enrollmentForms**) identifying the courses that you would like to double count for both your undergraduate and graduate degrees.
2. Submit an honor's undergraduate research proposal to the College of Engineering
3. Pursue honor's research in the Department of Mechanical and Aerospace Engineering
4. Submit official transcripts from all undergraduate institutions attended[1]
5. Submission of a one to two-page statement of purpose
6. A one to two-page résumé
7. One letter of recommendation from the students proposed undergraduate research supervisor. [2]

Program Rules. The rules for the combined degree program are as follows:

- Students can double-count to two courses toward their undergraduate and graduate degrees.
- Students are required to register for and complete either AE or ME 4999H (*Honors Research*)
- Courses that are to be double counted must be taken at Ohio State after acceptance into the combined degree program.

[1] Students who earned their undergraduate degree from Ohio State are not required to obtain official transcripts for their completed coursework here as it will be obtained through internal processes once an application is submitted. If a student transferred into Ohio State or has taken any classes for undergraduate or graduate credit from a different university, a transcript for each institution attended, aside from Ohio State, must be received directly by Ohio State's Graduate Admissions Office in order to be eligible for admission consideration.

[2] In the event the undergraduate supervisor is not able to provide a recommendation, then three recommendations are required consistent with the department's standard admission requirements.

- Only AE/ME/NE or other program approved courses 5000-level and above can be used for graduate credit if they meet the course requirements for the graduate degree being pursued.
    - Math 4000+ courses (except Math 4504) are also acceptable for MS student if it is being used as a double-counted course or it is specifically being used towards the graduate program's math requirement.
- Combined degree students who have not yet completed their bachelor's degree may take additional graduate level courses that will count for graduate credit only. Students intending to take such graduate-level courses must register for those courses in their graduate career stack.
- Upon receiving their undergraduate degrees, students enrolled in the combined degree program must meet all the degree requirements for the degree they are pursuing as detailed in the previous sections of this handbook.

Additional Information. Below is some additional information regarding the combined degree program:

1. Once admitted to the combined degree program, students are officially graduate students and as such are assessed graduate tuition.
2. Rank 4 students will continue to be eligible for undergraduate scholarships until they obtain their undergraduate degrees.
3. Per Graduate School rules, combined degree students are eligible for GRA positions (Section 8.1, *Graduate School Handbook*).

Combined Degree Student Seminar Policy. Combined degree students are only required to enroll in seminar once they have completed their BS degrees, however they are welcome and encouraged to participate in seminars prior to that as their schedules allow. They are expected to satisfy their program's seminar requirement once they have completed their BS degree.

6.2 DUAL DEGREE PROGRAM

Graduate School rules permit a student to pursue graduate degrees from two different graduate programs concurrently. Students interested in the dual degree program must already be admitted to a graduate degree seeking program at Ohio State. Students seeking admission to a dual degree program can submit a request for the dual degree program at any time so long as they are currently enrolled in a degree seeking graduate program. Students interested in pursuing the dual degree program in MAE must satisfy the following criteria:

1. Students will need to satisfy all graduation requirements set forth by both programs to receive a graduate degree from each program.
2. Students who are already pursuing a graduate degree in a MAE graduate program are not permitted to pursue the dual degree option with a second MAE graduate program, but they can pursue a dual degree program in other departments.[3]
3. A minimum of 50 percent of required coursework must be unique to each degree.

[3] Special requests for MAE graduate students to pursue the dual degree program in a second MAE graduate program will be considered. MAE graduate students can contact the MAE Graduate Advising Office for more information.

4. Research credits must be unique to the program in which the student is getting a degree. Students cannot use research credit as the coursework to be counted towards each degree.

The dual degree process and requirements, as outlined by the Graduate School, can be found in detail at **http://go.osu.edu/dual-degree**.

APPENDIX I: APPROVED MATH COURSES

Any courses listed below can count towards the math requirements in MAE.

COURSE #	COURSE TITLE
MATH 4512	Applied Partial Differential Equations (for engineers)
MATH 4551	Vector Analysis
MATH 4568	Linear Algebra for Engineering Graduate Students
MATH 4578	Discrete Mathematical Models
MATH 5101	Finite Linear Math
MATH 5102	Infin Linear Math
MATH 5251	Complex Var & App
MATH 5601	Computational PDEs
MATH 5602	Ess Numer Methods
MATH 5801	Gen Topol & Knots
MATH 6411	Ordin Differ Eqs 1
MATH 6451	Part Differ Eqs 1
MATH 6601	Num Meth Sc Comp 1 & 2
MATH 6602	Num Meth Sc Comp 1 & 2
STAT 6301	Probability for Statistical Inference
STAT 6302	Theory of Statistical Analysis
STAT 6801	Statistical Theory I
STAT 6802	Statistical Theory II
ME 6507	Intermediate Numerical Methods
ME 6665	Reliability Engineering I
ME 8518	Advanced Mathematical Methods in Mechanical Engineering
AE 8802	Advanced Mathematical Methods in Engineering
ECE 6750	Linear System Theory
ECE 6754	Nonlinear Systems Theory

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