GRADUATE STUDENT MANUAL

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SCHOOL OF
MECHANICAL AND AEROSPACE ENGINEERING
College of Engineering, Architecture and Technology

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1. Introduction to the MAE Graduate Programs

i. The OSU Graduate College and MAE Graduate Programs

The MAE graduate programs are organized and administered by MAE under the auspices of the OSU Graduate College and in accordance with all general Graduate College policies and procedures. The processes and guidelines shown in this manual have been developed in collaboration with the MAE Graduate Policy Committee, reviewed by the Graduate College and approved by the MAE Faculty.

Graduate College policies and procedures are available in the University Catalog: http://catalog.okstate.edu/graduate-college/#text-otp1

ii. MAE Graduate Programs

MAE offers the following graduate programs:

1. Master of Science (M.S.) Degree
   a. Accelerated Master of Science
2. Master of Science (M.S.) Degree with a concentration in Unmanned Aerial Systems
3. Master of Engineering (M.EN.) Degree
   a. Accelerated Master of Engineering
4. Doctor of Philosophy (Ph.D.) 60-hour program with MS degree
5. Doctor of Philosophy (Ph.D.) 60-hour program with MS degree and with a concentration in Unmanned Aerial Systems
6. Doctor of Philosophy (Ph.D.) 75-hour program with BS degree

iii. Contact Information:

Graduate Program Specialist:

Ms. Em Cunningham maintains and tracks MAE graduate student records and matriculation including application and enrollment forms, plan of study submittals and changes, and examination and graduation logistics. Contact Ms. Cunningham at maeacad@okstate.edu.

Graduate Coordinators:

Dr. James Manimala and Dr. Shuodao Wang manage and implement MAE graduate program policy and processes, including policy and processes related to student admission, matriculation progress, graduation, offers, awards, fellowships and teaching assistantships. They are engaged in proposing, planning, and management of graduate student engagement initiatives. They work closely with Ms. Cunningham and can also be contacted at maeacad@okstate.edu.

Graduate Policy Committee Chair:

Dr. Brian Elbing serves as the Chair of the MAE Graduate Policy Committee (GPC). The GPC develops and proposes changes to MAE graduate program processes and guidelines. The GPC also ensures student progress toward graduation and appropriate student engagement with their MAE Advisors and Advisory Committees. Dr. Elbing may be contacted at elbing@okstate.edu.

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2. Master of Science Degree Program

The MAE Master of Science (M.S.) degree is a 30-hour research-based degree that culminates in the publication of the student's research and findings in a thesis and paper. MAE does not support the M.S. 'non-thesis' option. Students interested in a non-thesis Master's degree are invited to investigate the MAE coursework only Master of Engineering (M.EN.) degree.

i. Summary of Requirements for M.S. Program:

Admission Requirements:

1. B.S. degree in Mechanical or Aerospace Engineering or a closely related field.

Graduation Requirements:

1. Complete 24 hours of formal coursework with an average point-grade of 'B' (3.00), with at least 18 of the 24 hours consisting of MAE 5000-6000 level classes.
2. Complete 6 hours of thesis research (MAE 5000) with a grade of 'SR' (for satisfactory research).
3. File a *Plan of Study* prior to the end of your 2nd non-summer semester.
4. Submit at least one conference or journal paper for publication.
5. Attend at least two (2) seminars covering topics pertaining to mechanical and aerospace engineering or closely related technical and professional development talks on campus.
6. Complete your M.S. Thesis, which is a document (typically 50 – 100 pages in length) that presents your research and findings.
7. Schedule your oral Final Examination. Email the defense announcement to the Graduate Program Specialist (*maeacad@okstate.edu*) at least 10 business days (two weeks) before the exam.

ii. Graduation Checklist for M.S. Program

- Visit the Academic Calendar on Graduate College website to determine all graduation deadlines (*https://gradcollege.okstate.edu/resources/student-resources.html*). There are no exceptions to the dates listed.
- Submit the following documents to the Graduate College by the published deadline:
  1. An updated Plan of Study and Change of Committee Request, if necessary.
  2. File Graduation Application (filed in Student Self-Service).
  3. Thesis Oral Defense Results Form in Round-Up.
  4. Document Approval Form in Round-Up
  5. Final version of Thesis (submitted online).

iii. Developing Your Plan of Study

Your signed and submitted *Plan of Study* is an agreement between you, your Advisor and your committee members on which courses you will take to partially complete the requirements for the Master of Science degree and support your thesis research. The steps you will follow in developing and filing your *Plan of Study* are shown in the following paragraphs.

Selecting Your Advisor: The first and most important step in developing your *Plan of Study* is to identify a MAE faculty member who will advise your M.S. studies and thesis research. It is your responsibility to initiate conversations with prospective faculty Advisors and find a faculty member who is willing to advise you, and who you are willing to be his or her advisee. The Advisor-Student relationship is established and maintained by mutual consent with you initiating the relationship and the faculty member either agreeing or declining to advise you. If you have trouble agreeing with your prospective Advisor on what courses you will take in your graduate program, it is likely that your interests lie elsewhere, and you should continue your search for an Advisor.

You must have an Advisor no later than the middle of your second semester. Normally, your Advisor will also serve as your Advisory Committee Chair. Your Advisor and Advisory Committee Chair must be a tenured or tenure-track MAE faculty member. Non-tenure track MAE faculty who are members of the Graduate Faculty may serve on your committee and may serve as your co-thesis Advisor. Your co-thesis Advisor may also be a tenure track faculty member from outside MAE who has been approved by the MAE RPT Committee. MAE tenured or tenure-track faculty must comprise a majority of your committee. All committee members must be members of the OSU Graduate Faculty with appointments that authorize them to serve on graduate committees. Please email the Graduate Coordinators if you have questions about selecting your Advisor and Advisory Committee Chair.

Selecting Your Committee Members: Once you have established the Advisor-Student relationship, you will select two additional committee members in consultation with your Advisor. The purpose of the committee is to provide technical guidance during your thesis research. Your Advisory Committee will also assess the quality and sufficiency of your final oral examination and thesis document.

Selecting Your Courses: In your first semester, you will consult with your Advisor (or Graduate Coordinator(s) if you do not yet have an Advisor) to select your courses for the semester. Send your course list to the Graduate Program Specialist at maeacad@okstate.edu prior to the beginning of the semester. The Graduate Program Specialist will make sure that you are cleared for enrollment in the specific classes of your choice. In subsequent semesters, your Plan of Study will list the courses you intend to take to satisfy the requirements for the Master of Science Degree. You will select these courses in consultation with your Advisor.

Filing Your Plan of Study: It is your responsibility to electronically file your completed Plan of Study with the Graduate College. You must have an approved Plan of Study on file with the Graduate College prior to the end of your second non-summer semester in order to enroll in classes for your third and following semesters. To begin the filing process, access the Plan of Study form from the Graduate College website (https://gradcollege.okstate.edu/resources/student-resources.html). Select your

Advisory Committee members and courses with the assistance of your Advisor and fill in the form. Make sure you save the electronic file with your information in case you are asked to make changes. You are responsible to ensure that all signatures are received. The Graduate Program Specialist will monitor the online signature process.

Changes to your committee or deviations from your filed Plan of Study are acceptable with the consent of your Advisor. If you take courses not on your Plan of Study with the consent of your Advisor, you must submit a revised (final) Plan of Study as you near the maximum number of hours required for degree completion (30 credit hours). Please refer to the Graduate College Academic Calendar for deadlines. A *Committee Change Request Form* (available at the Graduate College website) is required to make committee changes to a previously filed Plan of Study.

iv. Completing Your Course Work

A grade-point average of "B" (3.00) is required for all technical electives and MAE 5000 and 6000 courses listed on your Plan of Study. You will be placed on academic probation if your GPA falls below 3.0 in a given semester. Two consecutive semesters on academic probation will result in dismissal from the MAE M.S. program.

v. Completing Your Seminar Requirement

The seminar requirement is part of an initiative to encourage broader participation in MAE and closely related technical and professional development talks on campus. Students in the MS program are required to attend a minimum of two (2) seminars before they are allowed to schedule their final examination. You should plan to meet with your Advisor to identify seminars that align with your research focus area throughout the course of your graduate studies. Your Advisor must approve of any seminar you wish to attend to fulfill this requirement **in advance** of your attendance. To verify attendance, your Advisor may require that you document proof via photo at venue or sign-off by the event organizer.

Following the completion of this requirement, your Advisor will complete and sign the *'Graduate Seminar Completion Form'*, where they must list the seminars you have attended and their dates. This form will be reviewed by MAE's Graduate Program Coordinators after submission to maeacad@okstate.edu.

Example of Acceptable Events:

- *Distinguished Lectures*
- *Faculty Candidate Seminars*
- *Professional Development Talks*
- *Guest Speaker Seminars*

***Research Group Meetings DO NOT count towards the completion of your seminar requirement.*

vi. Completing Your Thesis Research

The time it takes you to complete your thesis research will vary depending on your technical writing skills, aptitude for research and the strength of your academic background. You are

strongly encouraged to create a *Research Development Plan* with your Advisor at the beginning of each semester of your M.S. program. The *Research Development Plan* articulates mutually agreed upon research goals and deliverables for the upcoming semester. It is primarily for your personal benefit but is a prerequisite after receiving a 'UR' (unsatisfactory research) grade in MAE 5000.

The scope of your development plan for a given semester will depend on your GRA/GTA commitments and your course workload for the semester. Performance and workload expectations for GTAs and GRAs are included in the *Graduate Research and Teaching Assistantships* section of this manual. In semesters when you hold a half-time GTA appointment along with a full-time course load, the expectation is that you will commit a minimum of 10-15 hours per week to your thesis research. With a half-time GRA working on thesis related research with a full-time course load, you should expect to commit 30-35 hours a week on thesis related research. In those semesters in which you enroll in three hours of thesis research (MAE 5000) or Independent Study as previously discussed, the expectation is that you will be able to commit an additional 15-20 hours per week on your thesis research.

Ideally, your thesis research will be initiated during your first semester with your Advisor and will be completed with 6 hours of thesis research (MAE 5000), submission of at least one conference or journal paper for publication, and the successful defense of your thesis.

M.S. Thesis Research (MAE 5000) Grades

At the end of each semester in which you are enrolled in your Advisor's Thesis Research hours section (MAE 5000), you will receive either a grade of "SR" (for satisfactory research) or "UR" (for unsatisfactory research). Your Plan of Study requires six hours of satisfactory research ('SR') with your Advisor. If you change Advisors, you will need to complete six hours of 'satisfactory research' under your new Advisor. Research hours are not included in your GPA calculation. After a grade of 'UR" in MAE 5000, you must have a current *Research Development Plan* on file with the Graduate Program Specialist in order to enroll. The development plan must articulate the deficiencies that earned you a 'UR' and articulate specific actions you will take to address those deficiencies.

After receiving a grade of "UR" in MAE 5000, you will be placed on Academic Probation by MAE in accordance with university policy. If you receive a second consecutive "UR" in MAE 5000, you will be dismissed from the MAE M.S. program. If you are unable to defend your thesis and complete your M.S. publication requirements prior to enrolling in your 13^{th} hour of MAE 5000, you will be dismissed from the MAE M.S. program. If you have performed satisfactorily in all other coursework, you will be given the opportunity to complete your studies in the MAE Master of Engineering (M.EN.) program, subject to Graduate College requirements. MAE fellowships and assistantships do not transfer to the M.EN. program.

Publication of Research Results

The minimum standard for MAE M.S. Thesis level research is publication of the major research results in a peer reviewed conference paper or preferably in a peer reviewed journal paper. Your paper must be submitted for review prior to your final examination.

Completion and Defense of M.S. Thesis

Your M.S. thesis will comprehensively report the background, objectives, methodologies, results and conclusions of your research program. The thesis will be organized and written in the Graduate College format with content agreed upon with your Advisor and other committee members (https://gradcollege.okstate.edu/resources/student-resources.html).

vii. Completing Your Final Examination

An oral examination is required of all M.S. candidates. Students are required to have an accurate Plan of Study on file, have attended two (2) seminars, and have one (1) conference or journal paper submitted for publication prior to the Final Examination.

You will schedule your final examination with the approval of your Advisor. You should allow thirty days following your exam for corrections and final committee approval of your thesis document. Exams scheduled less than 30 days in advance of the Graduate College *Oral Defense Form* deadline may result in delay of graduation.

You must deliver a final draft of your thesis, approved by your Advisor, to each member of your Examining Committee **at least two weeks prior to your oral defense date**. Late delivery to your committee may result in a rescheduling of your oral defense.

You must send an email (at least 10 business days in advance) to the Graduate Program Specialist (maeacad@okstate.edu) including the time and location of your defense and a PDF of your abstract so the MAE faculty and graduate students can be notified of your presentation.

Examining Committee

The Examining Committee for all M.S. candidates shall consist of the three (3) members of your Advisory Committee (including your Advisor). This committee is not necessarily the same faculty who signed your original Plan of Study, however, if your committee has changed, you must document these changes by having each current member sign the Committee Change Request form. This online form must be received by the Graduate College before you submit your final Plan of Study.

Form of Examination

You must make a 30–45-minute presentation of your thesis, answer questions from the audience in an open session, and answer questions from your Advisory Committee in closed session. Your Advisory Committee may also, at their discretion, examine your understanding of general coursework in your area of expertise. The total examination usually does not exceed two hours.

Result of Examination

The Committee will deliberate in closed session at the end of the examination and may announce their recommendation immediately following. A majority vote suffices. The recommendation will be one of the following: 1) 'pass' with suggested corrections, 2) 'pass', with mandatory corrections 3) 'incomplete' with a requirement to substantially rewrite the thesis and retake the examination the following semester, or 4) 'fail' with immediate expulsion from the MAE M.S. program and no opportunity to retake the examination. The Committee must also make a recommendation concerning study for the Ph.D. degree.

Report of M.S. Final Thesis Defense

You will be responsible for submitting the Oral Defense Results form thru Round-Up after successful completion of your oral defense.

M.S. Thesis Assessment Form

The Thesis Assessment Form was designed by the MAE Graduate Faculty to evaluate the M.S. student's research ability and communication skills, both written and oral, upon completion of their M.S. Thesis defense. A copy of this form is provided to your committee by the Graduate Program Specialist and will be returned by your Advisor at the close of your oral defense. Each committee member, including your chair must sign this form and the entire committee will assign a single score of 5, 4, 3, 2, or 1 to each individual category.

viii. Additional Student Responsibilities:

- Attend a Thesis Workshop (or Webinar) sponsored by the Graduate College. The OSU Graduate College specifies the correct format for M.S. theses. To access the webinar, log in to the Graduate Student Round-up website through http://planofstudy.okstate.edu/ and select "Thesis/Dissertation Webinar" from the menu. Prepare the thesis using the template or the uniform formatting guidelines provided by the Graduate College.
- Submit an electronic copy of the corrected thesis. You will receive emailed instructions for uploading the thesis after your *Document Approval Form* is submitted.

Your Advisor will submit the signed MAE M.S. Assessment form to the Graduate Program Specialist immediately following your defense. You will be responsible for submitting the Oral Defense Results form thru Round-Up after successful completion of your oral defense. Check your email for information from the Graduate College on required edits. Edits must be completed in a timely manner in order to graduate. Do not delay your graduation semester by failing to complete any required edits.

ix. Accelerated Master of Science

The Accelerated Master of Science program aims to provide the opportunity for undergraduate students to get a head start on their graduate degree, while completing their undergraduate program. Students admitted to the Accelerated Master's Program can take up to 9 credit hours at the graduate level during their senior year for dual credit.

To be eligible for the Accelerated Master's Program, a student must have completed 90+ hours of undergraduate study, not received any 'I' grades, and meet the minimum program requirements of a 3.0 GPA on coursework completed at OSU.

Students admitted to the Accelerated Master of Science Program cannot take any research hours (MAE 5000) until they have completed their undergraduate program.

Courses taken for dual credit (both graduate and undergraduate credit) during the student's senior year will only apply towards the graduate program that the student was admitted to under the Accelerated Master's Program. If a student decides to initiate a graduate program change following the completion of their undergraduate degree, the graduate credit acquired under the Accelerated Master's Program will be forfeited and cannot count towards their new graduate program's degree requirements.

2a. Master of Science Degree Course Requirements

A total of 30 credit hours including **24 hours of formal coursework** and **6 hours of thesis research** (MAE 5000) are required for the Master of Science Degree. Course requirements are shown in the table below.

MAE Courses	Technical Electives	Research Hours
18 hours minimum of 5000- or 6000- level MAE courses	6 hours of MAE approved courses	6 hours of MAE 5000

Important considerations in selecting your courses include the following:

1. *MAE 5000-6000 Courses*: Approved MAE graduate level courses are shown on the *MAE Graduate Course Offerings* sheet. Three hours of MAE Independent Study may be used to partially satisfy the MAE course requirement with your Advisory Committee's approval. In addition, for students with a matriculation date prior to Fall 2020, selected MAE and MATH 4000 level courses may satisfy MAE Plan of Study requirements. You will select eighteen hours (six courses) for your Plan of Study in consultation with your Advisor and with the approval of your Advisory Committee.
2. *Technical Electives:* Graduate level courses in MAE, mathematics or other disciplines that support your research may be selected as technical electives. Contact the Graduate Program Specialist (maeacad@okstate.edu) to receive a copy of the *MAE Graduate Course Offerings* and the *Approved Mathematics Courses* sheets. Please note:
    - Approval from your Advisor for courses not on these sheets must be received prior to enrollment.
    - Your Advisor must approve all changes to your Plan of Study *before* you enroll in any course not on your existing Plan of Study. Approval will not be granted retroactively.
3. *Research Hours*: The MAE M.S. program requires you to complete 6 hours of research (MAE 5000) under the supervision of your Advisor in your major area of expertise. Changing research areas will result in a requirement to retake all MAE 5000 hours as discussed in the *Conflict Resolution* section of this manual.

   Many students enroll in research hours in three-hour blocks during their last two semesters. This approach is especially beneficial if you are primarily supported by a teaching assistantship. You may, however, wish to consider taking one or two MAE

5000 research hours during each of your four semesters in program. This approach is especially beneficial for students with direct research funding in the form of research assistantships and/or fellowships.

2b. Master of Science Degree with Unmanned Aerial Systems Concentration Course Requirements

A total of 30 credit hours including **24 hours of formal coursework** and **6 hours of thesis research** (MAE 5000) are required for the Master of Science Degree. Course requirements are shown in the table below.

MAE Courses	**Technical Electives***	**Research Hours**
18 hours: -UAS Core: minimum of 12 hours -MAE Electives: 6 hours	6 hours of MAE approved courses	MAE 5000 (6 hours) leading to UAS thesis

Important considerations in selecting your courses include the following:

1. *MAE 5000-6000 Courses*: Any MAE graduate level course shown on the *MAE Graduate Course Offerings* sheet may be used to satisfy the required 6 hours of MAE electives. Three hours of MAE Independent Study may be used to satisfy 3 of the 6 hours with your Advisory Committee's approval. In addition, for students with a matriculation date prior to Fall 2020, selected MAE and MATH 4000 level courses may satisfy MAE Plan of Study requirements.

   You must also select a minimum of 12 hours (4 courses) from the following list of UAS core courses:

   MAE 5083 Engineering Acoustics
   MAE 5233 Advanced Fluid Dynamics I
   MAE 5313 Autopilot Design and Test
   MAE 5343 Advanced Aerospace Propulsion and Power
   MAE 5913 Advanced Aerodynamics
   MAE 5923 Guidance and Control of Aerospace Vehicles
   MAE 5943 Unsteady Aerodynamics and Aeroacoustics
   MAE 5963 Unmanned Aerial Systems Design and Analysis
   MAE 5973 Unmanned Aerial Systems Propulsion
   MAE 5983 Aircraft Certification and Test
   MAE 6313 Atmospheric Flight Control

**Approved Core Course Exceptions:

MAE 5020 Scientific Ballooning
MAE 5020 VTOL Flight Dynamics
MAE 5020 Rotorcraft Aerodynamics

MAE 5020 UAV Flight Test Engineering
MAE 5020 Configuration Aerodynamics

2. *Technical Electives:* Graduate level courses in MAE, mathematics or other disciplines that support your research may be selected as technical electives. Contact the Graduate Program Specialist (maeacad@okstate.edu) to receive a copy of the *MAE Graduate Course Offerings* and the *Approved Mathematics Courses* sheets. Please note:

   Approval from your Advisor for courses not on these sheets must be received prior to enrollment.

   Your Advisor must approve all changes to your Plan of Study *before* you enroll in any course not on your existing Plan of Study. Approval will not be granted retroactively.

3. *Research Hours*: The MAE M.S. program requires you to complete 6 hours of research (MAE 5000) under the supervision of your Advisor in your major area of expertise. Changing research areas will result in a requirement to retake all MAE 5000 hours as discussed in the *Conflict Resolution* section of this manual.

   Many students enroll in research hours in three-hour blocks during their last two semesters. This approach is especially beneficial if you are primarily supported by a teaching assistantship. You may, however, wish to consider taking one or two MAE 5000 research hours during each of your four semesters in program. This approach is especially beneficial for students with direct research funding in the form of research assistantships and/or fellowships.

3. Master of Engineering Degree Program

The MAE Master of Engineering (M.EN.) degree is a 33-hour coursework-only degree that culminates in a capstone experience.

i. Summary of Requirements for M.EN. Program:

Admission Requirements:

1. B.S. degree in Mechanical or Aerospace Engineering or a closely related field.

Graduation Requirements:

1. Complete 30 hours of formal coursework with an average grade-point of "B" (3.00), with at least 21 hours of MAE 5000-6000 level classes
2. File a *Plan of Study* prior to the end of your 2nd non-summer semester.
3. Attend at least two (2) seminars covering topics pertaining to mechanical and aerospace engineering or closely related technical and professional development talks on campus.
4. Complete 3-hour capstone experience (MAE 5010).

ii. Graduation Checklist for M.EN. Program

- Visit the Academic Calendar on Graduate College website to determine all graduation deadlines (*https://gradcollege.okstate.edu/resources/student-resources.html*). There are no exceptions to the dates listed.
- Submit the following documents to the Graduate College by the published deadline:
    1. An updated Plan of Study and Change of Committee Request, if necessary.
    2. File Graduation Application (filed in Student Self-Service).

iii. Developing Your Plan of Study

Your Plan of Study shows the courses that you plan to complete for your M.EN. degree. The plan must include three hours of capstone design experience (MAE 5010) as shown in the table below. You will develop your Plan of Study in consultation with your Advisor. If you choose to select a capstone experience from the list of MAE approved capstone courses, the MAE Graduate Policy Committee will serve as your Advisory Committee and appoint one of its members to serve as your Advisor and as Chair of your Advisory Committee.

If you choose to design a capstone experience in collaboration with a specific faculty member, the first and most important step is to identify a MAE faculty member who is a member of Graduate Faculty and who will advise your M.EN. studies. It is your responsibility to initiate conversations with prospective faculty Advisors and find a faculty member who is willing to advise you, and who you are willing to be his or her advisee. The Advisor-Student relationship is established and maintained by mutual consent with you initiating the relationship and the faculty

member either agreeing or declining to advise you. You must have an Advisor no later than the middle of your second semester. Your Advisor will assist in selecting your Advisory Committee.

Selecting Your Courses: Your Plan of Study will list the courses you intend to take to satisfy the requirements for the Master of Engineering Degree. You will select these courses in consultation with your Advisor. Your 33 credit hours must satisfy the following:

MAE Courses	Technical Electives	Capstone Experience
21 hours minimum of 5000- or 6000- level MAE courses	9 hours of MAE approved courses	3-hour MAE 5010 capstone course

M.EN. Capstone Courses

Enrollment required in MAE 5010 for the specific course.
Department permission required.

MAE 4273	Experimental Fluid Dynamics (with instructor approval)
MAE 5010	Integrated Computational Materials
MAE 5010	Hydrodynamic Stability & Transition to Turbulence
MAE 5313	Autopilot Design & Test
MAE 5343	Advanced Aero Propulsion & Power (MAE 4243 is a prerequisite)
MAE 5593	Theory of Viscoelasticity
MAE 5763	Wave Motion
MAE 5953	Aerospace Systems Engineering
MAE 6233	Turbulent Fluid Dynamics (with instructor approval)
MAE 6313	Atmospheric Flight Control
MAE 6423	System Identification (with Dr. Faruque)

Important considerations in selecting your courses include the following:

1. *MAE 5000-6000 courses*: Approved MAE graduate level courses are shown on the *MAE Graduate Course Offerings* sheet. You will select twenty-one hours (seven courses) for your Plan of Study in consultation with your Advisor.
2. *Technical Electives:* Graduate 5000-level courses in MAE, mathematics or other disciplines may be selected as technical electives with the approval of your Advisor.
3. *Capstone Experience*: If you choose to select a capstone experience from the list of MAE approved capstone courses, email the Graduate Program Specialist (maeacad@okstate.edu) to initiate the enrollment process. The Graduate Program Specialist will open a MAE 5010 capstone section associated with the

approved course for you to enroll in. You can also select a graduate capstone course outside of the list above. In that case, contact the Graduate Program Specialist to initiate the process and seek approval from the instructor of that graduate course. If you choose an independent study capstone experience in collaboration with your Advisor to fulfill the capstone requirement, you will also email maeacad@okstate.edu to initiate the enrollment process. Once your Advisor has the syllabus for your MAE 5010, Independent Study capstone experience on file with the Graduate Program Specialist, you will be cleared to enroll in the course**.**

Filing Your Plan of Study: It is your responsibility to electronically file your completed Plan of Study with the Graduate College. You must have an approved Plan of Study on file with the Graduate College prior to the end of your second non-summer semester in order to enroll in classes for your third and following semesters. To begin the filing process, access the Plan of Study form from the Graduate College website (https://gradcollege.okstate.edu/resources/student-resources.html). Select your Advisory Committee members and courses with the assistance of your Advisor and fill in the form. Make sure you save the electronic file with your information in case you are asked to make changes. You are responsible to ensure that all signatures are received. The Graduate Program Specialist will monitor the online signature process.

Changes to your committee or deviations from your filed Plan of Study are acceptable with the consent of your Advisor. If you take courses not on your Plan of Study with the consent of your Advisor, you must submit a revised (final) Plan of Study as you near the maximum number of hours required for degree completion (33 credit hours). Please refer to the Graduate College Academic Calendar for deadlines. A *Committee Change Request Form* (available at the Graduate College website) is required to make committee changes to a previously filed Plan of Study.

iv. Completing Your Course Work

A grade-point average of "B" (3.00) is required for all technical electives and MAE 5000 and 6000 courses listed on your Plan of Study. You will be placed on academic probation if your GPA falls below 3.0 in a given semester. Two consecutive semesters on academic probation will result in dismissal from the MAE M.EN. program.

v. Completing Your Seminar Requirement

The seminar requirement is part of an initiative to encourage broader participation in MAE and closely related technical and professional development talks on campus. Students in the M.E.N program are required to attend a minimum of two (2) seminars before they are allowed to enroll in their capstone. You should plan to meet with your Advisor to identify seminars that align with your focus area throughout the course of your graduate studies. Your Advisor must approve of any seminar you wish to attend to fulfill this requirement **in advance** of your

attendance. To verify attendance, your Advisor may require that you document proof via photo at venue or sign-off by the event organizer.

Following the completion of this requirement, your Advisor will complete and sign the *'Graduate Seminar Completion Form'*, where they must list the seminars you have attended and their dates. This form will be reviewed by MAE's Graduate Program Coordinators after submission to maeacad@okstate.edu.

Example of Acceptable Events:

- *Distinguished Lectures*
- *Faculty Candidate Seminars*
- *Professional Development Talks*
- *Guest Speaker Seminars*

vi. Accelerated Master of Engineering

The Accelerated Master of Engineering program aims to provide the opportunity for undergraduate students to get a head start on their graduate degree, while completing their undergraduate program. Students admitted to the Accelerated Master's Program can take *up to 9 credit hours* at the graduate level during their **senior year** for dual credit. Students enrolled in the accelerated program do not qualify for MAE's graduate program deadlines until their primary matriculation is their graduate matriculation (following the completion of their undergraduate program).

To be eligible for the Accelerated Master's Program, a student must have completed 90+ hours of undergraduate study, not received any 'I' grades, and meet the minimum program requirements of a 3.0 GPA on coursework completed at OSU.

Courses taken for dual credit (both graduate and undergraduate credit) during the student's senior year will only apply towards the graduate program that the student was admitted to under the Accelerated Master's Program. If a student decides to initiate a graduate program change following the completion of their undergraduate degree, the graduate credit acquired under the Accelerated Master's Program will be forfeited and cannot count towards their new graduate program's degree requirements.

4. Doctoral Degree Programs

The university requirements for the Ph.D. degree are determined by the Graduate College and can be found in the *University Catalog* (http://catalog.okstate.edu/).

i. Summary of Requirements for 60 Hour Ph.D. Program:

Admission Requirements:

1. M.S. degree in Mechanical or Aerospace Engineering or a closely related field.

Graduation Requirements:

1. Complete 24-30 hours of formal coursework including at least 12 hours of MAE 5000-6000 level classes with an average point-grade of 'B' (3.00) and 24-30 hours of research under the supervision of your Advisor with a grade of 'SR'.
2. Upon the approval of a student's PhD committee, the student is allowed to transfer up to 9 credit hours of formal coursework from her/his M.S. degree at an accredited institution, to satisfy part of the required 24-30 hours of coursework. All courses used as transfer credit must have a grade of "B" or better. Requests for transfer credit must include an official transcript.
3. Determine your committee prior to end of 3rd non-summer semester.
4. File a *Plan of Study* prior to end of 3rd non-summer semester.
5. Enroll in 6 hours of Preliminary Examination coursework (MAE 6010) prior to end of 3rd non-summer semester. Complete MAE 6010 no later than 4th non-summer semester.
6. Schedule and complete the Preliminary Exam. Email your preliminary exam announcement to the Graduate Program Specialist (maeacad@okstate.edu) at least 10 business days before the exam.
7. Publish your first of two (2) peer-reviewed conference or journal papers.
8. Schedule and complete the Qualifying Examination at least six (6) months prior to Final Examination. Email your Qualifying Exam announcement and dissertation abstract to the Graduate Program Specialist at least 10 business days before the exam.
9. Attend at least four (4) seminars covering topics pertaining to mechanical and aerospace engineering or closely related technical and professional development talks on campus.
10. Publish your second of two (2) peer-reviewed conference or journal papers.
11. Schedule and complete the Final Examination. Email your defense announcement and dissertation abstract to the Graduate Program Specialist at least 10 business days before the exam.

ii. Summary of Requirements for 75 Hour Ph.D. Program:

Admission Requirements:

1. B.S. degree in Mechanical or Aerospace Engineering or a closely related field.

Graduation Requirements:

1. 39-45 hours of formal coursework including at least 21 hours of MAE 5000-6000 level classes.
2. Determine your committee prior to end of 2nd non-summer semester.
3. File a *Plan of Study* prior to end of 3rd non-summer semester.
4. Attend at least five (5) seminars covering topics pertaining to mechanical and aerospace engineering or closely related technical and professional development talks on campus.
5. Enroll in 6 hours of Preliminary Examination coursework (MAE 6010) prior to end of 5th non-summer semester. Complete MAE 6010 no later than 6th non-summer semester.
6. Schedule and complete the Preliminary Exam. Email your preliminary exam announcement to the Graduate Program Specialist (maeacad@okstate.edu) at least 10 business days before the exam.
7. Publish your first of three (3) peer-reviewed conference or journal papers.
8. Schedule and complete the Qualifying Examination at least six (6) months prior to Final Examination. Email your Qualifying Exam announcement and dissertation abstract to the Graduate Program Specialist at least 10 business days before the exam.
9. Publish your second and third of three (3) peer-reviewed conference or journal publication.
10. Schedule and complete the Final Examination. Email your defense announcement and dissertation abstract to the Graduate Program Specialist at least 10 business days before the exam.

iii. Graduation Checklist for Ph.D. Program

- Visit the Academic Calendar on Graduate College website to determine all graduation deadlines (*https://gradcollege.okstate.edu/resources/student-resources.html*). There are no exceptions to the dates listed.
- Submit the following documents to the Graduate College by the published deadline:
    1. An updated Plan of Study and Change of Committee Request, if necessary.
    2. File Graduation Application (filed in Student Self-Service).
    3. Dissertation Oral Defense Results Form in Round-Up.
    4. Complete Survey of Earned Doctorates (*link to the survey is sent after the Graduate College receives your Oral Defense Results form*).
    5. Document Approval Form in Round-Up
    6. Final version of dissertation (submitted online).

iv. Selecting Your Advisor:

Doctoral applicants must have an Advisor before being fully admitted to the MAE Ph.D. program. It is your responsibility to initiate conversations with prospective faculty Advisors and find a faculty member who is willing to advise you, and who you are willing to be advised by during the admission process. The Advisor-Student relationship is established and maintained by mutual consent with you initiating the relationship and the faculty member either agreeing or declining to advise you. Your Advisory Committee Chair and Advisor must be a tenured or tenure-track MAE faculty member and a member of the Graduate Faculty. Non-tenure track MAE faculty who are members of the Graduate Faculty may serve on your committee and may serve as your co-dissertation Advisor. Your co-dissertation Advisor may also be a tenure track faculty member from outside MAE who has been approved by the MAE RPT Committee and is a member of the Graduate Faculty. Please email the Graduate Coordinators if you have questions about selecting your Advisor and Advisory Committee Chair.

- If your advisor leaves the university, you will need to find a new advisor whose research focus is in a similar field to your previous advisor. Students are encouraged to consult the remaining members of their Advisory Committee to see if they are open to stepping into the role of Advisor, or if they have recommendations for the role. Any research hours completed under your Advisor before they left the university will be retained and count towards your degree completion under your new Advisor.

v. Selecting Your Committee Members:

In your first academic year, you will select three to four additional committee members in consultation with your Advisor. All committee members must be members of the OSU Graduate Faculty with appointments that authorize them to serve on graduate committees. The purpose of the committee is to provide technical guidance during your dissertation research and to assess the quality and sufficiency of your final dissertation.

MAE tenured or tenure-track faculty must comprise a majority of your Advisory Committee. In addition, all doctoral committees are required to have one 'outside' (non-MAE faculty) member. Typically, outside members are recruited from other engineering schools within CEAT, the Department of Mathematics or one of the science departments.

vi. Developing Your Plan of Study

Your Plan of Study is an agreement between you, your Advisor and your Advisory Committee members on which courses you will take to partially complete requirements for the Ph.D. degree and support your dissertation research. The steps you will follow in developing and filing your Plan of Study are shown in the following paragraphs.

Selecting Your Courses: Your Plan of Study will list the courses you intend to take to satisfy the requirements for the Ph.D. Degree. You will select these courses in consultation with your Advisor.

Filing Your Plan of Study: It is your responsibility to electronically file your completed Plan of Study with the Graduate College. You must have an approved Plan of Study on file with the Graduate College prior to the end of your 3rd non-summer semester in order to enroll in classes for your 4th and following semesters. To begin the filing process, access the Plan of Study form from the Graduate College website (https://gradcollege.okstate.edu/resources/student-resources.html). Select your committee and courses with the assistance of your Advisor and fill in the form. Make sure you save the electronic file with your information in case you are asked to make changes. The Graduate Program Specialist will monitor the online signature process to ensure that all signatures are received.

Changes to your Advisory Committee or changes to your selection of MAE 5000-6000 level courses are acceptable with the consent of your Advisor. If you take courses not on your Plan of Study with the consent of your Advisor, you must submit a revised (final) Plan of Study as you near the maximum number of credit hours required for degree completion (60 credit hours). A *Committee Change Request Form* (available at the Graduate College website) is required to make committee changes to a previously filed Plan of Study.

vii. Completing Your Course Work

An average point-grade of 'B' (3.00) is required for all MAE 5000 and 6000 level courses listed on your Plan of Study. You will be placed on academic probation if your GPA falls below 3.0 in a given semester. Two consecutive semesters on academic probation will result in dismissal from the MAE Ph.D. program.

viii. Completing Your Seminar Requirement

The seminar requirement is part of an initiative to encourage broader participation in MAE and closely related technical and professional development talks on campus. Students in the Ph.D. program are required to attend a minimum of four (*for 60hr Ph.D. students*)/five (*for 75hr Ph.D. students*) seminars before they are allowed to schedule their final examination. You should plan to meet with your Advisor to identify seminars that align with your research focus area throughout the course of your graduate studies. Your Advisor must approve of any seminar you wish to attend to fulfill this requirement **in advance** of your attendance. To verify attendance, your Advisor may require that you document proof via photo at venue or sign-off by the event organizer.

Following the completion of this requirement, your Advisor will complete and sign the *'Graduate Seminar Completion Form'*, where they must list the seminars you have attended and their dates. This form will be reviewed by MAE's Graduate Program Coordinators after submission to maeacad@okstate.edu.

Example of Acceptable Events:

- *Distinguished Lectures*
- *Faculty Candidate Seminars*
- *Professional Development Talks*
- *Guest Speaker Seminars*

***Research Group Meetings DO NOT count towards the completion of your seminar requirement.*

ix. Completing Your Preliminary Exam

The intent of the MAE 6010 research, paper and examination is to demonstrate your ability to engage in doctoral level research and to prepare and defend a doctoral level research plan. Your MAE 6010 research topic must be well aligned with your Advisor's expertise and research interests, and ideally your MAE 6010 research topic will also be well-aligned with a research assistantship you hold in your Advisor's laboratory. Under the best of circumstances, the topic you and your Advisor select for MAE 6010 will be the same topic you defend in your Qualifying Examination.

Development of your MAE 6010 research proposal begins with the identification of an Advisor approved research topic in your 1st non-summer semester and ends with the successful completion of your Preliminary Exam, which must occur no later than your 4th non-summer semester in the 60-hour Ph.D. program and no later than your 6th non-summer semester for the 75-hour Ph.D. program. If you fail to complete your Preliminary Exam by the MAE deadline, you will be placed on academic probation, and you should contact your Advisor and develop a remedial plan for research and further enrollment in the program. Two consecutive semesters on academic probation will result in dismissal from the MAE Ph.D. program with the opportunity to apply your completed coursework toward a Master of Engineering (M.EN.) degree.

The following steps should be followed in the semesters leading up to and including the semester in which you are enrolled in six (6) hours of MAE 6010—your Preliminary Exam semester:

1. Develop a written research proposal on a topic relevant to your research as discussed in the preceding paragraphs. The proposal is expected to be of the highest quality and approximately 50 pages in length. Your written research proposal should clearly: 1) identify a problem, 2) engage with all relevant literature, 3) define a theoretical, experimental, and/or computational approach to solving the problem, and 4) plan a research program to implement the approach.
2. Work with your Committee early in the semester to schedule your Preliminary Examination. You must submit your written research proposal to your committee no less than two weeks prior to your scheduled exam date and take the exam no later than one week prior to the end of the semester.
3. Prepare an oral presentation of your written research proposal. The oral presentation should be approximately 40-45 minutes in length and should focus on all salient points of your proposal. Your Preliminary Examination will begin with your oral presentation of your research proposal. Following the presentation, you will answer questions from the audience in an open session, and questions from your committee in closed session. Your committee may ask any questions about your written research proposal as well as questions from engineering fundamentals, mathematics, or scientific areas covered by previous coursework at their discretion.

4. If your committee is not satisfied with your written research proposal and oral examination, you may receive an 'incomplete' in MAE 6010 and be required to stand for further examinations or submit a revised research proposal. Up to three written examinations may be given in order to more accurately ascertain your preparedness for continuing as a candidate in the MAE Ph.D. program. In the event of written examinations, your committee shall specify the topics covered by each exam, the rules associated with each exam (e.g., length of exam, allowable books, notes, etc.) and the grading rubric for each exam. You will have no less than one month to prepare for the series of exams, and no more than one exam will be given per day. In lieu of or in addition to the written examinations described above, your committee may, at their discretion, prescribe additional oral examinations. The oral exams must follow the same guidelines and parameters that apply to written exams. A grade of 'incomplete' must be cleared in less than one year.
5. If you fail MAE 6010 with a grade of C, D or F, you will be dismissed from the MAE Ph.D. program.

Preliminary Examination Grades

A or B	Encouraged to continue Ph.D. Program
IC	Conditional continuation in Ph.D. Program, with a re-evaluation during the following regular semester.
C, D, F	Dismissal from MAE Ph.D. Program

Objectives of the Examination

1. Redirect candidates with poor prospects of success in the Ph.D. Program before the students have made large investments of time and resources.
2. Provide a focal point for the student's committee to evaluate the student's potential and Plan of Study.
3. Demonstrate the student's familiarity with the literature, ability to organize a research proposal, competence in oral and written communication, and understanding of engineering fundamentals, mathematics, and areas of science related to the student's chosen field of specialization.

Preliminary Examination Report

Your Committee will complete the *Preliminary Examination Results* form and return to the Graduate Program Specialist immediately following your defense.

Length of Examination

The main oral exam based on your research proposal may be scheduled for up to three hours. The additional written and oral exams may be scheduled for up to 12 hours at the committee's discretion.

x. Admission to Ph.D. Candidacy

To be admitted to candidacy, you must have (1) an approved *Plan of Study* on file with the Graduate College and (2) satisfactorily complete the Preliminary Exam (MAE 6010) with a grade

of “A” or “B”. Once you complete these requirements, you are responsible for submitting the *Admission to Doctoral Candidacy Form* thru Round-Up.

xi. Completing Your Dissertation Research

The time it takes you to complete your dissertation research will vary depending on your technical writing skills, aptitude for research and the strength of your academic background. You are strongly encouraged to create a *Research Development Plan* with your Advisor at the beginning of each semester of your Ph.D. program. The *Research Development Plan* articulates mutually agreed upon research goals and deliverables for the upcoming semester in the context of the overall scope and objectives of your dissertation research. It is primarily for your personal benefit but is a prerequisite for enrollment in the next semester if your research fails to satisfactorily progress as determined by:

1. a grade of ‘UR’ (unsatisfactory research) in MAE 6000.
2. failure to complete MAE 6010 (preliminary examination) with a grade of ‘A’ or ‘B’ by the MAE deadline.
3. failure to pass your Qualifying Examination before you have completed all MAE 6000 hours on your plan of study.

Expectations for research progress will depend on your GRA/GTA commitments and your course workload for the semester. Performance and Workload expectations for GTAs and GRAs are included in the *Graduate Research and Teaching Assistantships* section of this manual. In those semesters in which you enroll in three or more hours of dissertation research (MAE 6000), the expectation is that you will be able to commit additional time to your dissertation research—a minimum of 15-20 hours per week for every three hours of MAE 6000 enrollment. Even in semesters when you hold a GTA appointment along with a full-time course load with no MAE 6000 hours, the expectation is that you will find time to commit a minimum of 10-15 hours per week to your dissertation research. A GRA with a full-time course load, on the other hand, should expect to commit 30-35 hours a week to dissertation-related research.

Ph.D. Dissertation Research (MAE 6000) Grades: At the end of each semester in which you are enrolled in your Advisor’s Dissertation Research hours section (MAE 6000), you will receive either a grade of “SR” (for satisfactory research) or “UR” (for unsatisfactory research). Your Plan of Study requires 24-30 hours of satisfactory research (‘SR’) with your Advisor. If you change Advisors, you will need to complete 24-30 hours of ‘satisfactory research’ under your new Advisor. Research hours are not included in your GPA calculation.

If you receive a research grade of “UR” from your Advisor, you must also submit your *Research Development Plan* to the Graduate Program Specialist before you will be allowed to enroll in the next semester. The development plan must articulate the deficiencies that earned you a “UR” and articulate specific actions you will take to address those deficiencies.

After receiving a grade of "UR" in MAE 6000, you will be placed on Academic Probation by MAE in accordance with university policy. If you receive a second consecutive "UR" in MAE 6000, you will be dismissed from the MAE Ph.D. program. If you have performed satisfactorily in all other coursework you will be given the opportunity to complete your studies in the MAE Master of Engineering (M.EN.) program, subject to Graduate College requirements. MAE fellowships and assistantships do not transfer to the M.EN. program.

xii. Completing Your Qualifying Examination

Your Qualifying Examination must be scheduled in consultation with your Advisor no less than six months prior to your anticipated final examination and after you have completed and published a substantial portion of the research that will support your dissertation. To be eligible for the Qualifying Examination, you must have at least one (1) full peer-reviewed conference or journal paper in review. The examination will consist of a written prospectus and an oral examination:

Written Prospectus

The written prospectus is a formative version of your dissertation containing the essential elements of your final document. It is strongly recommended that you organize and write your prospectus in accordance with the Graduate College format available at their website (https://gradcollege.okstate.edu/resources/student-resources.html).

The prospectus must be submitted to each member of your Advisory Committee no less than two weeks prior to the oral exam date. The prospectus must contain:

1. Table of Contents
2. List of Figures
3. List of Nomenclature
4. Definition of Dissertation problem
5. Background and literature survey
6. Preliminary research results
7. Tasks and timeline (e.g., a GANTT chart) for completion of Degree
8. References
9. Appendices:
    a. All dissertation related publications
    b. Code (if applicable)

This prospectus should have greater depth and detail than the MAE 6010 proposal presented at the Preliminary Exam and must contain partial analysis or some experiments and computations to prove the feasibility of the methods chosen. This document should have the format of a dissertation with all completed work at the date of the exam. Some chapters may not exist or be complete, but the committee will be able to evaluate the breadth of the research for which the PhD will be awarded. *Note that the Qualifying Exam must not be delayed until work is completed – it may not be taken less than six months before the Final Examination.*

Oral Examination

You will make an oral presentation of your written prospectus including a discussion of your completed, pending and planned publications and your plan to complete your research. The oral examination establishes your qualifications to complete your proposed research. You must make a 40–45-minute presentation of your written prospectus, answer questions from the audience in an open session, and answer questions in closed session from your committee. The committee will then discuss and determine if the completed and proposed research is worthy of the doctoral degree on a pass/fail basis.

Report of Qualifying Examination Results

The Committee will complete the *Qualifying Examination Results Form* and return it to the Graduate Program Specialist, immediately following the Qualifying Examination. If you fail the Qualifying Exam, you will be required to correct the deficiencies and retake the Qualifying Exam. If you fail a 2nd time, you will be dismissed from the MAE Ph.D. program. You may appeal committee decisions to the *MAE Graduate Policy Committee* through the Graduate Policy Committee Chair. *MAE Graduate Policy Committee* decisions are final.

xiii. Completing Your Final Examination

A written dissertation in Graduate College format and an oral examination are required of all MAE Ph.D. candidates. Students are required to have an accurate Plan of Study on file prior to the Final Examination. To be eligible for the Final Examination, you must have at least one (1) full peer-reviewed conference or journal paper accepted for publication with your remaining required paper(s) in review.

Examining Committee

The Examining Committee for all Ph.D. candidates shall consist of the 4 members of your Advisory Committee (including your Advisor). Committee members must also be members of the OSU Graduate Faculty, and 3 of your committee members must be members of the MAE faculty. If your Advisory committee has changed since you filed your Plan of Study, you must document these changes by having each member sign the *Committee Change Request form*. This online form must be filed with the Graduate College at the time you submit your final Plan of Study.

Emeriti MAE faculty may serve as your Advisor or as a member of your examining committee but may not serve as chair. Your outside member may not be emeritus.

Form of Examination

You must make a 40–45-minute presentation of your Dissertation, answer questions from the audience in an open session, and again later in closed session with the Committee. The Committee may also question you with respect to your understanding of general coursework, ensuring competency within your chosen area(s) of mechanical and aerospace engineering. The total examination usually requires two to three hours.

Result of Examination

The Committee will deliberate in closed session at the end of the examination and may announce their recommendation immediately following. A majority vote suffices. The recommendation will be one of the following: 1) pass, 2) pass, with minor corrections before final approval to submit the document will be given 3) undergo a major rewrite and retake the examination the following semester, or 4) fail. The 'fail' recommendation expels the student from the MAE Ph.D. program and will not be given before the student has had an opportunity to retake the examination.

Report of Ph.D. Final Dissertation Defense

You will be responsible for submitting the Oral Defense Results form thru Round-Up after successful completion of your oral defense.

Ph.D. Dissertation Report Assessment Form

This assessment was designed by the MAE Graduate Faculty to evaluate Ph.D. students' research ability and communication skills, both written and oral, upon completion of their Ph.D. Dissertation defense. A copy of this form will be distributed to your committee. Each committee member, including your chair must sign this form.

xiv. Additional Student Responsibilities:

- Attend a dissertation workshop (or webinar) sponsored by the Graduate College. The OSU Graduate College specifies the correct format for Ph.D. dissertations. To access the webinar, log in to the Graduate Student Round-up website through http://planofstudy.okstate.edu/ and select "Thesis/Dissertation Webinar" from the menu. Prepare your dissertation using the template or the uniform formatting guidelines provided by the Graduate College.
- Schedule your preliminary, qualifying and final examinations with the approval of your Advisor. Allow thirty days following each exam for corrections and final committee approval. Final exams scheduled less than 30 days in advance of the Graduate College *Oral Defense Form* deadline may result in delay of graduation. Exams will not be scheduled during pre-finals week through the date on which final grades are due for the semester.
- Deliver a final draft of your preliminary, qualifying and dissertation documents, approved by your Advisor, to each member of your Examining Committee at least two weeks prior to your scheduled examination date. Late delivery to your committee may, upon request of a committee member, result in postponement of your examination.
- Send an email (at least 10 business days in advance) to the Graduate Program Specialist (maeacad@okstate.edu) including the time and location of your exam and a PDF of your exam abstract so the MAE faculty and graduate students can be notified of your presentation.

- Submit the original final exam signature approval page signed by all committee members to the Graduate College. You may solicit signatures from your committee after you have taken the oral examination and made all recommended corrections.
- Submit an electronic copy of your corrected dissertation. You will receive emailed instructions for uploading the dissertation after your *Oral Defense Form* is submitted.

Your Advisor will submit the signed MAE Ph.D. Assessment form to the Graduate Program Specialist immediately following your defense. You will be responsible for submitting the Oral Defense Results form thru Round-Up after successful completion of your oral defense. Check your email for information from the Graduate College on required edits. Edits must be completed in a timely manner in order to graduate. Do not delay your graduation semester by failing to complete any required edits.

4a. Course Requirements for 60-hour Ph.D. Program

A total of 60 credit hours consisting of 24-30 hours of formal coursework, 6 hours of Preliminary Examination (MAE 6010) and 24-30 hours of dissertation research (MAE 6000) are required for the MAE post M.S. Doctor of Philosophy Degree.

Courses for the 60-hour Ph.D. program must satisfy the following criteria:

Courses beyond the M.S. Degree	**Preliminary Examination**	**Dissertation Research**
24-30 hours of 5000- or 6000- level courses	6 hours of MAE 6010	24-30 hours of MAE 6000

Important considerations in selecting your courses include the following:

5000-6000 level courses: A minimum of 24 hours of 5000-6000 level course work beyond the M.S. degree satisfies the requirements of the MAE 60-hour Ph.D. program. At least 12 hours must be approved MAE graduate level courses in your Advisor's field of expertise. Approved courses are shown on the *MAE Graduate Course Offerings* sheet and may not have previously been taken to satisfy the requirements of any prior degree. Three (3) hours of MAE Independent Study (MAE 5010) may be used to partially satisfy the non-MAE course requirement with your Advisor's approval. You will select the course work for your Plan of Study in consultation with your Advisor. Upon the approval of a student's PhD committee, the student is allowed to transfer up to 9 credit hours of formal coursework from her/his M.S. degree at an accredited institution, to satisfy part of the required 24-30 hours of coursework. All courses used as transfer credit must have a grade of "B" or better. Requests for transfer credit must include an official transcript.

Preliminary Examination—MAE 6010: Before the end of your 3rd non-summer semester in the MAE Ph.D. program, you must contact the Graduate Program Specialist (maeacad@okstate.edu) to enroll in 6 hours of MAE 6010 (Advanced Study) for the next semester. Your Preliminary Exam semester will be focused on successfully completing the requirements associated with these 6 hours. Your grade for all 6 hours will be determined by your Advisory Committee and is based on:

- Your written research proposal and the oral presentation of your proposal to your Advisory Committee.
- Follow-up written and/or oral examinations which may be prescribed at the discretion of your Advisory Committee to evaluate perceived weaknesses in your research proposal and/or in your initial oral examination.

MAE 6010 is defined as, '*Study and investigation under the supervision of a member of the faculty along lines of interest well advanced of and supported by the 5000-series courses*,' Although it is completed in a single semester, it should be carefully planned in consultation with your Advisor and your Advisory Committee beginning in your first semester in the Ph.D. program.

Research Hours—MAE 6000: The MAE Ph.D. program requires you to complete 24-30 hours of research (MAE 6000) under the supervision of your Advisor in your major area of expertise. Changing research areas will result in a requirement to retake all MAE 6000 hours as discussed in the *Conflict Resolution* section of this manual.

4b. Course Requirements for 60-hour Ph.D. Program with Unmanned Aerial Systems Concentration

The Ph.D. Degree with Unmanned Aerial Systems (UAS) Concentration requires 30 hours of coursework, 6 hours of MAE 6010 (preliminary exam) and 24 hours of MAE 6000 (research).

Courses for the 60-hour post M.S. degree Ph.D. program with the Unmanned Aerial Systems Concentration must satisfy the following criteria:

MAE Courses	**Technical Electives**	**Preliminary Examination**	**Research Hours**
21 hours: -UAS Core: minimum of 12 hours -MAE Electives: 9 hours	**9 hours**: MAE approved courses.	**6 hours**: MAE 6010	**24 hours**: MAE 6000

MAE 5000-6000 Courses: Any MAE graduate level course shown on the *MAE Graduate Course Offerings* sheet may be used to satisfy the required 9 hours of MAE electives with your Advisor's approval. Three hours of MAE Independent Study may be used to satisfy 3 of the 9 hours with your Advisory Committee's approval. Upon the approval of a student's PhD committee, the student is allowed to transfer up to 9 credit hours of formal coursework from her/his M.S. degree at an accredited institution, to satisfy part of the required 24-30 hours of coursework. All courses used as transfer credit must have a grade of "B" or better. Requests for transfer credit must include an official transcript. The transferred credit hours can only be used in place of MAE electives and technical electives.

You must also select a minimum of 12 hours (4 courses) from the following list of UAS core courses:

MAE 5083 Engineering Acoustics
MAE 5233 Advanced Fluid Dynamics
MAE 5313 Autopilot Design and Test
MAE 5343 Advanced Aerospace Propulsion and Power
MAE 5913 Advanced Aerodynamics
MAE 5923 Guidance and Control of Aerospace Vehicles
MAE 5943 Unsteady Aerodynamics and Aeroacoustics
MAE 5963 Unmanned Aerial Systems Design and Analysis
MAE 5973 Unmanned Aerial Systems Propulsion
MAE 5983 Aircraft Certification and Test
MAE 6313 Atmospheric Flight Control

**Approved Core Course Exceptions:

MAE 5020 Scientific Ballooning
MAE 5020 VTOL Flight Dynamics
MAE 5020 Rotorcraft Aerodynamics
MAE 5020 UAV Flight Test Engineering
MAE 5020 Configuration Aerodynamics

Technical Electives: Graduate level courses allowed with permission of the student's Advisory Committee.

Preliminary Examination—MAE 6010: Before the end of your 3rd non-summer semester in the MAE Ph.D. program, you must contact the Graduate Program Specialist to enroll in 6 hours of MAE 6010 (Advanced Study) for the next semester. Your Preliminary Exam semester will be focused on successfully completing the requirements associated with these 6 hours. Your grade for all 6 hours will be determined by your Advisory Committee and is based on:

- Your written research proposal and the oral presentation of your proposal to your Advisory Committee.
- Follow-up written and/or oral examinations which may be prescribed at the discretion of your Advisory Committee to evaluate perceived weaknesses in your research proposal and/or in your initial oral examination.

MAE 6010 is defined as '*Study and investigation under the supervision of a member of the faculty along lines of interest well advanced of and supported by the 5000-series courses*. Although it is completed in a single semester, it should be carefully planned in consultation with your Advisor and your Advisory Committee beginning in your first semester in the Ph.D. program.

Research Hours—MAE 6000: The MAE Ph.D. program requires you to complete 24-30 hours of research (MAE 6000) under the supervision of your Advisor in your major area of expertise. Changing research areas will result in a requirement to retake all MAE 6000 hours as discussed in the *Conflict Resolution* section of this manual.

4c. Course Requirements for 75-hour Ph.D. Program

A total of 75 credit hours consisting of 39-45 hours of formal coursework, 6 hours of Preliminary Examination (MAE 6010) and 24-30 hours of dissertation research (MAE 6000) are required for the MAE post B.S. Doctor of Philosophy Degree.

Courses for the 75-hour Ph.D. program must satisfy the following criteria:

Courses beyond the B.S. Degree	**Preliminary Examination**	**Dissertation Research**
39-45 hours of 5000- or 6000- level courses	6 hours of MAE 6010	24-30 hours of MAE 6000

Important considerations in selecting your courses include the following:

5000-6000 level courses: A minimum of 39 hours of 5000-6000 level course work beyond the B.S. degree satisfies the requirements of the MAE Ph.D. program. At least 21 hours must be approved MAE graduate level courses in your Advisor's field of expertise. Approved courses are shown on the *MAE Graduate Course Offerings* sheet and may not have been previously taken to satisfy the requirements of any prior degree. Six (6) hours of MAE Independent Study (MAE 5010) may be used to partially satisfy the non-MAE course requirement with your Advisor's approval. You will select the course work for your Plan of Study in consultation with your Advisor.

You must complete 18 hours of MAE coursework at the 5000 and 6000 level in your first two semesters and must identify your Advisory committee before proceeding to your third semester, as previously discussed. In addition, you must maintain a GPA of 3.5 or higher during your first two semesters to continue in the 75-hour B.S. to Ph.D. program. If your GPA is less than 3.5 after your second semester, you will be automatically moved to the M.S. program and will need to complete all requirements of the M.S. degree before proceeding to the 60-hour Ph.D. program. You may appeal to remain in the 75-hour Ph.D. program by contacting the Graduate Policy Committee Chair who will seek a formal recommendation from your Advisory Committee. The recommendation of your Advisory Committee is final.

Preliminary Examination—MAE 6010: Before the end of your 5th non-summer semester in the MAE Ph.D. program, you must contact the Graduate Program Specialist to enroll in 6 hours of MAE 6010 (Advanced Study) for the next semester.

Your Preliminary Exam semester will be focused on successfully completing the requirements associated with these 6 hours. Your grade for all 6 hours will be determined by your Advisory Committee and is based on:

- Your written research proposal and the oral presentation of your proposal to your Advisory Committee.
- Follow-up written and/or oral examinations which may be prescribed at the discretion of your Advisory Committee to evaluate perceived weaknesses in your research proposal and/or in your initial oral examination.

MAE 6010 is defined as '*Study and investigation under the supervision of a member of the faculty along lines of interest well advanced of and supported by the 5000-series courses*. Although it is completed in a single semester, it should be carefully planned in consultation with your Advisor and your Advisory Committee beginning in your first semester in the Ph.D. program.

Research Hours—MAE 6000: The MAE Ph.D. program requires you to complete 24-30 hours of research (MAE 6000) under the supervision of a dissertation Advisor in your major area of expertise. Changing research areas will result in a requirement to retake all MAE 6000 hours as discussed in the *Conflict Resolution* section of this manual.

5. Graduate Research and Teaching Assistantships

Your approach to completing your course work and thesis/dissertation research in a timely manner will depend to some extent on how your graduate education is funded. Many MAE graduate students receive a stipend for serving as a graduate research assistant (GRA) or a graduate teaching assistant (GTA) or both. The responsibilities of a GRA and GTA are stated in the Graduate College section of the OSU Catalog (http://catalog.okstate.edu/graduate-college/#text) as follows:

> **GRA Responsibilities:** A *GRA (Graduate Research Assistant) is provided a stipend, and their primary responsibilities are to provide general support to the University's research mission. These responsibilities may or may not relate directly to the student's thesis or dissertation. Duties of the GRA primarily involve applying and mastering research concepts, practices or methods of scholarship*.
>
> **GTA Responsibilities: The** *GTA (Graduate Teaching Assistant) is provided a stipend and their primary responsibilities are to support the University's instructional mission. Services provided by a GTA may include: classroom or laboratory teaching; advising and mentoring of students; proctoring examinations; grading papers, homework, and/or projects; accompanying/coaching musical or vocal performances, providing artistic instruction or assisting with preparation and management of materials and programs that are utilized in imparting knowledge or in the instructional process; or providing other general assistance in the instruction process. GTAs may not be given duties to support faculty research or those primarily clerical in nature*.

MAE GRAs are assigned to perform specific research related tasks, either in their Advisor's laboratory or in another university research laboratory. As noted above, assigned research tasks may or may not be directly related to your thesis/dissertation research. GRAs are expected to prioritize completing tasks and meeting deadlines set by their research supervisor. On average, the GRA workload should be calibrated to approximately 10 hours per week for a ¼ time appointment (20 hours per week for a ½ time appointment).

MAE GTAs are assigned to support a specific undergraduate class or laboratory. They report to, and their performance is evaluated by, the instructor of the class. GTAs are expected to prioritize completing tasks and meeting the deadlines set by their instructor. On average, the GTA workload should be calibrated to approximately 10 hours per week for a ¼ time appointment (20 hours per week for a ½ time appointment). However, GTA tasks are normally not evenly distributed over the semester or week. GTAs are expected to adjust their weekly schedules to accommodate the uneven workload of a normal semester. All GTA appointments and reappointments are made by the Graduate Coordinators to best support the undergraduate instructional mission of MAE. **MAE GTAs are required to review the MAE Graduate Teaching Assistant Manual prior to the start of their appointment**.

6. Conflict Resolution

i. Academic Appeals

Professional disagreements between you and your Advisor related to research quality, direction or completeness will be adjudicated and resolved by your Advisory Committee. You must submit the question for committee consideration along with evidence supporting your position in writing to the Graduate Policy Committee Chair for distribution to your committee. Your Advisory Committee will make every effort to respond in writing to the Graduate Policy Committee Chair in a timely manner. You may appeal the decision of your Advisory Committee in writing to the *MAE Graduate Policy Committee***.** The *MAE Graduate Policy Committee* will meet to consider your appeal. Every attempt will be made to resolve your appeal as quickly as possible. When possible, the *MAE Graduate Policy Committee* will complete the appeals process within 60 calendar days. A majority vote of The *MAE Graduate Policy Committee* shall determine the outcome of your appeal.

A student may appeal to the Graduate College when their concern has already progressed through departmental appeals and involves the following:

- Program Requirements
- Research Grades
- Formal Reports/Creative Components
- Program Dismissals
- Preliminary, Qualifying, Comprehensive Exam Procedures
- Thesis/Dissertation Defense Policies

Please note that professional and scholarly assessments made by faculty and advisory committees are generally not appealable. More importantly, **any appeal to the Graduate College,** regardless of the specific context from which it originates, **must be based upon a program's failure to adhere to its, the Graduate College's, or the University's published rules and regulations**; *appeals to the Graduate College that do not meet this requirement will not be considered*.

ii. Changing Advisors

After starting your program, it is possible that you may realize that your research interests/goals do not align with your Advisor and their research group. Normally, your Advisor will also recognize that it is not a good fit. Thus, the decision to release a student from a research group is typically mutually agreed upon. It is the responsibility of the student to identify a new Advisor or change to another degree option or program. The MAE Graduate Coordinators can assist with this process, but MAE is under no obligation to provide the student a new Advisor. Research assistantships, including those promised in an initial letter of offer, will not follow you to your new Advisor. Your next steps differ depending on your degree program and progress towards completion.

M.S.: All MAE 5000 hours completed under your existing Advisor must be retaken under your new Advisor and you must secure a new Advisor prior to the start of the next non-summer semester to remain in the master's program.

Ph.D.: All MAE 6000 hours completed under your existing Advisor must be retaken under your new Advisor and you must secure a new Advisor prior to the start of the next non-summer semester to remain in the doctoral program.

**If your new Advisor's research area is closely related to your existing Advisor's research area, in that the research completed under your existing Advisor will be used in your new research/dissertation, you can petition MAE's Graduate Policy Committee to allow for the transfer of your completed MAE 6000 hours. Your petition should be sent to MAE's Graduate Policy Committee Chair, Dr. Brian Elbing (elbing@okstate.edu), and must include your reasoning for how your completed MAE 6000 hours tie to your research under your new Advisor along with an endorsement from your new Advisor.*

iii. Resolving Other Conflicts

Resolution of all interpersonal conflicts or any other personal issue or problem begins with a confidential conversation with the OSU Ombuds Officer. The Office of the Ombuds is specifically tasked by the university president to promote a supportive working and learning environment at OSU. (https://go.okstate.edu/about-osu/leadership/president/ombuds-office/index.html)

7. Academic and Research Integrity

i. Academic Integrity

As stated in the OSU catalog, Oklahoma State University is committed to maintaining the highest level of academic integrity and ethical behavior. MAE expects all graduate students to support and promulgate the values of honesty and responsibility appropriate for an academic community. Not only does such academic integrity and ethical behavior contribute to the status of the University, but it also represents an important component of the educational process. To assure a high level of integrity among students, behaviors that violate academic integrity (e.g., unauthorized collaboration, plagiarism, multiple submissions, cheating on examinations, fabricating information, helping another person cheat, unauthorized advance access to examinations, altering or destroying the work of others, and fraudulently altering academic records) will not be condoned nor tolerated. University standards for academic integrity may be found on the OSU website at http://academicintegrity.okstate.edu/

ii. Research Integrity

As stated on Oklahoma State University's website for research compliance (https://research.okstate.edu/compliance/index.html), all students, faculty and staff conducting research are required to apply the highest ethical standards. Education and training in the ethical and responsible conduct of research is an essential element of training for individuals who are pursuing degrees or engaging in research in any field. Responsible conduct of research training includes modules on proper citation of other work, plagiarism, research misconduct, intellectual property and copyright, falsification and unwarranted editing of data, conflict of interest, authorship on manuscripts, and mentor-mentee relationships. During your first semester you must complete the *Responsible Conduct in Research* training module.

iii. Reporting Unethical or Unprofessional Behavior

If you have a concern that may involve unethical or unprofessional behavior on the part of any university employee or student, it is your responsibility to immediately report the behavior to the appropriate university office. Your report will be received in strict confidentiality. Subsequent action will maintain your anonymity to the extent possible in accordance with established university policy.

- Anonymous reports of research misconduct may be submitted at https://secure.ethicspoint.com/domain/en/report_custom.asp?clientid=10933.
- Student conduct concerns should be reported to the *Office of Student Support and Conduct* (https://ssc.okstate.edu/).

iv. Reporting Gender Discrimination and Sexual Harassment

As stated in the *OSU Graduate Student Appeals Policy* (https://gradcollege.okstate.edu/resources/appeals-policy.pdf)*:*

The University is committed to providing an environment of study and work free from gender discrimination and sexual harassment as prohibited by Title VII and Title IX (P&P 1-0702). Any individual who believes she/he may have experienced gender discrimination, including sexual harassment, or who believes that she/he has observed such actions taking place, may receive information and assistance regarding the University's policies and responsive processes from any of the following offices:

- Director of Affirmative Action /Title IX Coordinator, 408 Whitehurst Hall, 405-744-5371;
- Student Conduct Officer, 326 Student Union Building, 405-744-5470;
- Vice President of Student Affairs, 201 Whitehurst Hall; 405-744-5328;

8. MAE Graduate Faculty

https://ceat.okstate.edu/mae/faculty-staff/index.html

Andy Arena Professor Noble Foundation Chair andy.arena@okstate.edu	Alyssa Avery Teaching Assistant Professor alysssa@okstate.edu
Christian Bach Professor cbach@okstate.edu	Jake Bair Assistant Professor jbair@okstate.edu
Boris Benedikter Assistant Professor boris.benedikter@okstate.edu	Anthony Comer Assistant Professor anthony.comer@okstate.edu
Brian Elbing Professor Tom Cunningham Chair elbing@okstate.edu	Imraan Faruque Associate Professor i.faruque@okstate.edu
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