GRADUATE HANDBOOK

OF THE

DEPARTMENT OF AEROSPACE ENGINEERING AND ENGINEERING MECHANICS

UNIVERSITY OF CINCINNATI

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PREFACE

All graduate students in the Department of Aerospace Engineering and Engineering Mechanics (AEEM) should familiarize themselves with the contents of this document. It is recommended that graduate students retain the handbook for their personal use throughout their degree program. All students are expected to be thoroughly aware of, and conform to, all the requirements and regulations of AEEM and UC.

THE GRADUATE COLLEGE

The Graduate College of the University of Cincinnati administers policies pertaining to supervision, rules and regulations of graduate education, maintains graduate student records, provides central administrative services to the graduate programs, assigns and monitors allocations of university graduate scholarship and assistantship funding, and supports the academic mission of the individual graduate programs, including those of the Department of Aerospace Engineering and Engineering Mechanics. It is the role of the Graduate Faculty to determine educational policy of the Graduate College, regulate admission of students, candidacy and awarding of graduate degrees. The Graduate Faculty has sole power in establishing requirements, but leaves to each individual department the right to determine specific courses of study, precise manners of instruction and individual methods for evaluating the results of examinations. The rules and regulations of the Graduate College are delineated in the University of Cincinnati Graduate College Graduate Handbook. This manual may be consulted for general regulations. The Graduate Handbook of the Department of Aerospace Engineering and Engineering Mechanics contains the entire policies specific to the Department's graduate programs and is in compliance with the rules and policies of the Graduate College.

DEPARTMENT OF AEROSPACE ENGINEERING AND ENGINEERING MECHANICS (AEEM)

The administrative organization of the Graduate Program in the Department of Aerospace Engineering and Engineering Mechanics (AEEM) consists of the following:

GRADUATE PROGRAM CHAIR

The Graduate Program Chair (GPC) is appointed by the Department Chair. The GPC oversees the smooth operation of the Graduate Program and serves as liaison between the Department and the College Graduate Office. The GPC serves as Chairperson of the School Graduate Committee (DGC). The GPC convenes meetings of the DGC. The GPC is charged with keeping accurate and timely graduate records, implementing graduate policy, appointing temporary advisors to students who have not yet chosen a permanent advisor, and certifying students for graduation. The GPC administers the recruiting and admission efforts, the preparation and dissemination of recruiting literature, the correspondence with prospective graduate students, and processing of graduate

applications.

DEPARTMENT GRADUATE COMMITTEE

The *Department Graduate Committee* consists of three department faculty representing each of the three technical areas in the Department: *Dynamics & Controls, Fluid Dynamics & Propulsion Systems,* and *Solids & Structural Mechanics*. Each Committee member is appointed by the Department Head in consultation with the area faculty.

The GPC is the chairperson of the DGC and does not represent his own area. In addition, the President of the School Graduate Student Association acts as a non- voting student representative to the DGC.

The GPC calls regular meetings of the DGC (at least one per semester) to review graduate student progress and discuss other issues as they arise including requests from any faculty member or graduate student. The DGC deliberates on any issue concerning the Graduate Program, interprets graduate policy and proposes new policy from time to time. The DGC serves as a School Grievance Committee for any and all issues pertaining to the Graduate Program. The DGC also coordinates each Ph.D. qualifying exam. The DGC makes admission and financial assistance decisions.

A quorum for a DGC meeting consists of at least 3 of the voting members. All issues are decided by a simple majority vote of the members present. Any faculty member, graduate student or staff member may request that an item be placed on the DGC meeting agenda or may submit a petition by sending a written request to the GPC. When the issue comes before the DGC, whoever made the request may be asked to appear at the meeting.

GRADUATE PROGRAM COORDINATOR

The AEEM *Graduate Program Coordinator (GPC)* handles the day-to-day operations on behalf of the CEAS Graduate Studies Office. The primary activities of the GC are:

- Typing all correspondence related to School graduate affairs
- Processing all graduate applications for review
- Maintaining graduate database and files

- Interacting with School faculty, staff and students and College and University offices (Graduate School, Registrar, Personnel, International Services, etc.) to resolve student and operational problems

- Interacting with the Manager of Technical Education Programs of General Electric Aviation and the Director for Education of the Ohio Aerospace Institute on matters related to their special programs

- Handling the graduation process for graduate students

- Handling long-distance (voice, FAX, mail and e-mail) communication with prospective graduate students

- Providing statistics concerning graduate students and applicants

DEPARTMENT GRADUATE SECRETARY

- Assisting with the preparation of the Ph.D. Qualifying Exam

- Assisting with Teaching Assistantship (TA) assignments and bi-annual reviews, graduate student annual reviews, etc.

- Assisting with preparation of recruiting materials, and School graduate brochures and handbooks

DEPARTMENT BUSINESS OFFICER

- Handling Personnel Action Forms (PAF) and other paperwork for graduate assistants

I. APPLICATION AND ADMISSION TO GRADUATE DEGREE PROGRAMS

A. APPLICATION

PROCESS

Application should be made directly to the Graduate School using the on-line system (https://grad.uc.edu/admissions.html). Applicants should ensure that all application materials are received well in advance of their proposed starting date.

Students are usually admitted for the Fall Semester of any academic year. However, applications are processed on a continuous basis and in exceptional circumstances admission for another semester may be granted.

To enhance their chances at securing financial aid (stipend and/or tuition remission), applicants interested in such aid should apply prior to February 1.

REQUIREMENTS

Admission to the Graduate Program requires a baccalaureate degree (or its equivalent) in engineering, physics, mathematics or some other related area. Those having non-engineering degrees should take core courses in engineering early in their graduate studies. Applicants are expected to have a minimum undergraduate grade point average (GPA) of 3.0 (out of 4.0). A Graduate Record Examination (GRE) score must be submitted with the application. Flexibility in the admissions criteria will be maintained, and students will be treated individually. In exceptional cases, a student lacking the minimal requirement may be granted admission, on a provisional basis.

TYPES OF ADMISSIONS

Full Graduate Standing

Students meeting the minimum criteria for admission are admitted with full graduate standing. These students are eligible for financial aid, if available, and are entitled to all rights and privileges (as well as subject to all regulations) as any other graduate student in good standing.

Provisional Admission

Students may be admitted to the Graduate Program under special circumstances or with provisional status. This may include probation or satisfactory elimination of deficiencies. It should be emphasized that contingencies will be made on a case-by-case basis, lasting for a stated period of time (usually one academic year), and will be specified in the admission letter. Students may attain full graduate standing when the conditions responsible for their provisional status are corrected, subject to approval of the DGC.

Part-time Study

Students may apply for admission for part-time study. Such students will be eligible to receive a degree from the School. Domestic part-time students must register for one graduate credit hour per year to maintain their standing in the program. In addition, they must take the AEEM Graduate Seminar prior to graduation. A Ph.D. Degree Program study may be initiated on a part- time basis to complete coursework and qualifying examinations. However, the student must accumulate one academic year residence. All part-time doctoral programs will require the approval of the DGC. A part-time student in good standing will be granted full-time status upon written request to and approval from the Graduate Program Chair.

Unclassified Graduate Student

Unclassified graduate students are admitted to the Graduate School for study, but not admitted for graduate degree programs. They may take courses for graduate credit, but the number of credits taken under this classification, which are accepted for a degree program, is at the discretion of the School; ordinarily it will not exceed 10 graduate credits. The only requirement for admission as an unclassified student, or special student, is evidence of a baccalaureate degree.

Foreign Student Admission

Foreign graduate students applying to the School for admission must demonstrate evidence of ability to speak and write English. A minimal Test of English as a Foreign Language (TOEFL) score of 80 (92 for a Graduate Assistantship) on the internet-based test (iBT) or 220 on the computer-based test (CBT) is required. Alternatively, a score of 60 on the Test of Spoken English (TSE) is accepted.

B. ADMISSIONS, ADVISORS, AND FINANCIAL AID DECISIONS

ADMISSION

All admissions to the Graduate Program in the Department of Aerospace Engineering and Engineering Mechanics are competitive and subject to review by the Graduate Committee.

Each applicant will be judged on the basis of:

- Overall grade point average (GPA); GPA in the junior and senior years, GPA in the major area. A value of 3.0 (B) or above is expected in at least one of these.
- Graduate Record Examination (GRE) verbal, quantitative, analytical are required; subject tests are optional.
- At least two letters of recommendation on the supplied forms.
- Official transcripts of all previous baccalaureate and graduate work.

- School faculty interest and available laboratory space or research activity.

- Students originally admitted to the M.S. Program and wishing to transfer to or continue towards the Ph.D. may apply for admission to the doctoral program by sending a written request to the GPC. The student's Advisor and/or the Research Advisory Committee must endorse the request.

- Availability of financial aid, availability of research funds, or evidence that the applicant has financial means to support him/herself.

**Admission decisions are not made on the basis of age, sex, ethnic origin, religion, sexual orientation, or physical handicap.

ADVISORS

Upon acceptance, a student will be assigned a temporary faculty contact. Upon arrival, a temporary faculty advisor is assigned. The temporary faculty advisor may be the same as the temporary faculty contact. Prior to the end of the first semester after arrival on campus, the student must select a permanent research advisor for M.S. thesis or Ph.D. dissertation. If an appropriate advisor cannot be obtained in this time frame, a waiver from the Graduate Office must be obtained. Once a permanent advisor is selected, any change of advisor requires the approval of both the current and new advisors. The student should inform the current advisor of any planned change prior to discussion with a new advisor. A form for this purpose can be obtained from the Graduate Secretary.

Joint Advisors and Interdisciplinary Programs

If a graduate student enrolled in the School wishes (1) to have a joint advisor in another school, or (2) to carry out his/her thesis/dissertation research in a laboratory outside the School or (3) to pursue an Interdisciplinary Graduate Program involving the Department of Aerospace Engineering and Engineering Mechanics, such arrangements will require advanced approval of the DGC. In all cases, active participation by one or more faculty of the Department of Aerospace Engineering and Engineering Mechanics will be necessary.

Financial Aid

Types of awards and guidelines for graduate awards are described under ***Financial Support*** in the ***UC Graduate Handbook*** published by the Graduate School.

Types of Support

The Department of Aerospace Engineering and Engineering Mechanics has a variety of Assistantships and Scholarships which are awarded to deserving students in support of their graduate education.

- *Graduate Assistantship (GA)* awards provide for full time students a stipend for a nine-month period: August 1 through April 30. In addition, a *University Graduate Scholarship (UGS)* will be awarded to cover the costs of tuition and fees. The value of the stipend will be announced in the award letter. **The University has determined that the stipend should be treated as taxable pay, and federal, state, and city taxes are withheld from the stipend checks.**

- Those students receiving a GA are required to work approximately (20) hours per week, including effort on instructional assistance and on their research, depending on the type of funding. An offer letter detailing the GA responsibilities will be provided by the department. These students are also assigned to an Assistantship Advisor. Graduate Assistants are expected to participate in the teaching and research functions of the Department, usually helping with the research efforts of his/her Assistantship Advisor, assisting in laboratory courses, grading papers, or possibly teaching a course. Specific assignments are made each year by the GPC usually in consultation with advisors and students. The specific duties for the research assignment will be given by the Assistantship Advisor.

- *Research Assistantships (RAs)*, which are funded from research grants or contracts of individual faculty members, may be awarded. These awards are made by individual faculty members. It is the responsibility of the student to meet with faculty members in the student's area of interest to determine the availability of RA positions. The stipend level for RAs will be set by the individual faculty member to a level comparable to that paid to a GA. Students awarded an RA will be eligible to receive a UGS if they satisfy the guidelines for support stated below (Section I.A.4.c.ii) and apply for such an award to the GPC.

- *School Service Assistantship* awards are available periodically and are part- time awards. They carry a small stipend and a tuition remission scholarship. This assistantship requires about (8) hours a week of grading, laboratory assistance, research assistance or school service activity.

- A graduate student requesting financial aid may be awarded a *University Graduate Scholarship (UGS)* only. Such awards cover the costs of tuition and all fees except the general fee. If the student is supported on an external grant to the minimum acceptable level set by CEAS, a fee waiver can be requested by his/her research faculty advisor. This must be requested no later than one month prior to the start of any semester. In addition, if the student is supported by an external grant the award must provide tuition payments at a specified rate, if the awarding agency permits. A UGS will then be awarded to cover the remaining tuition balance.

The University of Cincinnati and the Department of Aerospace Engineering and Engineering Mechanics offer a limited number of Graduate Scholarships awarded competitively to eligible students. Information regarding these awards and application requirements will be announced to graduate students each year by the GPC when the information becomes available.

There are several sources of financial aid available on a competitive basis for the Summer Semester. Announcements for these will be made during the Fall and Spring Semesters. The University Research Council (URC) offers Summer Fellowships, with applications normally due about the end of January. There are also some Summer Research Assistantships available from individual faculty as well as the Distinguished Dissertation Fellowship which is awarded each spring.

Guidelines for Financial Awards

Decisions on awards are based solely on academic potential as indicated by credentials for new students or by actual performance in the case of continuing students. The guidelines below are followed by the DGC when awarding financial aid.

- Initial awards are for one academic year. Support for additional years is based on the student's academic performance. Those with a GPA of less than 3.0 during the first year will not be considered for support of any kind during the second year.

- Further support will depend on the availability of aid, the student's academic performance, teaching or research performance, and normal progress towards the degree (2 years for M.S. and 3 years beyond the M.S. for the Ph.D.). The student must meet with his/her advisor at least once every year to complete a performance review form. This form must be signed by the advisor and transmitted to the GPC. This form is required if further support of any kind is requested. The meeting is also an opportunity for the student to discuss any academic, research or other problems or issues.

- Graduate Assistantship (GA) support is generally offered to incoming students only. Except for special terminal Ph.D. awards, a student will not receive GA support past the second year of study in the AEEM. It is expected that further financial aid will be as a research assistant supported by the student's major advisor. The student should make arrangements with his/her advisor for any financial support during summer semesters or beyond the second year of graduate study.

- Financial aid is not normally terminated during the period for which it has been granted. However, for serious reasons such as poor academic performance, teaching or research duties, or moral turpitude, a dismissal hearing by the DGC may be convened. If the dismissal hearing warrants it, the DGC may terminate prematurely a student support.

- International students who are interested in teaching assignments must pass the Oral English Proficiency Test (OEPT) (see at http://www.cech.uc.edu/cesl/oept/). This exam must be taken twice during each year of study by all International students for whom English is not the native language until it is passed.

- One special course in English offered by the Center for English as a Second Language (CESL) (see at http://www.cech.uc.edu/cesl/) in preparation for the OEPT is allowed for graduate credit and can be applied toward the (15) UGS credit hours per semester.

- Under ordinary circumstances, tuition scholarships will not be awarded to students who have attempted 170 or more semester hours. Students with master's degrees from other institutions will not be eligible for tuition scholarships after attempting 140 semester hours at our University.

- UC policy permits tuition scholarships for degree related courses only. That is, students may be awarded a UGS only if they require credits for the completion of a degree. In addition, a tuition scholarship can still only be awarded for full-time study. **This policy requires students to pay careful attention to their workload and make every effort to graduate in a timely manner.**

- School policy on UGS tuition scholarships caps the number of semesters a student can receive full time UGS funds. M.S. students may now receive UGS funds for no more than 3 semesters. Ph.D. students with an M.S. degree may now receive UGS funds for no more than 4 semesters and Ph.D. students without an M.S. degree no more than 7 semesters.

At the beginning of the Spring Semester of each academic year, the GPC will send an announcement to all graduate students asking if they wish to be considered for financial support for the following academic year. All awards are made on a competitive basis. Students who currently do not receive financial aid will also be considered at this time. Only students requesting aid, in writing before March 1st, will be considered by the Graduate Committee with entering students for the coming year and other renewal candidates. Students applying after this date will be considered only if there are remaining funds available. A letter will be sent before the end of the Spring Semester notifying the student of the award decision. The AEEM Annual Progress Review is required for continuing students.

In reviewing the request, the Graduate Committee will proceed as outlined below:

- The members of the DGC will meet to review student requests and recommendations by the advisors. It will decide, by a majority vote of the members present, whether each student will be awarded financial support for the coming academic year.

- For all doctoral students, the advisor will provide a written assessment of performance at the end of the academic year. This is part of the annual review. This evaluation will be used by the DGC in making award decisions.

- In the event that the decision of the DGC is negative, the student may appeal the decision within one week of notification. The appeal must be made to the DGC by sending a written request to the GPC. The student and/or his/her advisor will be allowed to present information in person on behalf of the student. The DGC will decide by a majority vote of the members present whether to uphold or rescind the earlier decision. The results of the vote will be final.

C. PRE-REGISTRATION PROCEDURES AND REQUIREMENTS

SUPPLEMENTARY INFORMATION FORM

The supplementary Information Form must be completed prior to registration by the following individuals:

- new students entering the University
- students not enrolled in the previous academic year
- students who transfer to another college
- students who have earned their Master's degree and are admitted to the Department's Ph.D programs.

TRANSFER OF CREDITS

As a means of assuring that the character and standards embodied in graduate degrees awarded by the University of Cincinnati are preserved, limits are set on the amount of work completed at other institutions which can be included as fulfilling graduate degree requirements. Transfer of credits from other universities, summer programs, etc., are subject to the approval of the student's Advisor and the Graduate Program Chair. Limits are as follows:

Master's Degrees

The minimum requirement for these degrees is one year's full-time graduate study, or its equivalent. Eligibility for graduation requires a minimum of thirty-two (32) graduate credits for a thesis or a non-thesis program, **the latter half** of which must be completed while in residence at the University of Cincinnati; two (2) credits for the school seminar is included in the (32) semester credits total (see GE-ACE students for an exception). The M.S. thesis is twelve (12) credits. A student who has conducted previous graduate work at another institution that has not been used towards a degree may petition the DGC to transfer up to six (6) semester credit hours of relevant coursework with grades of "B" or better. Total out-of-school courses are still limited (see Section I.B.2.*c* below).

Doctoral Degrees

These degrees are conferred on the basis of extensive study and high scholarly attainment in a special field of learning. In no case, however, will the degree be granted for less than three years of full-time graduate study or its equivalent, of which the last year must be in residence at the University of Cincinnati or under the University's direction. Eligibility for graduation requires a minimum of ninety-two (90) graduate credits, the last thirty (30) of which, exclusive of research credits, must be completed at the University of Cincinnati. Two (2) credits for the school seminar is included in the (90) credits total. A student who enters the School with a M.S. degree may be credited with a maximum of thirty (30) semester credits, of which a maximum of twenty (20) course credits may be from another university. In addition, a maximum of ten (10) research credits can also be transferred.

Out of School Course Limits

M.S. students are allowed to take six (6) credit hours of coursework outside of the AEEM department. The 6 credit hours do not include any Math courses needed to meet the degree math requirements. Ph.D. students who have an earned M.S. degree are allowed to take nine (9) credit hours of their Ph.D. coursework outside of the school. The 9 credit hours do not include any math courses needed to meet the degree math requirements. Ph.D. students who choose not to earn an M.S. degree are allowed to take fifteen (15) credit hours of coursework outside of the school. The 15 hours do not include any math courses needed to meet the degree math requirements.

II. REGISTRATION

A graduate student must be registered in the Graduate School to earn graduate credit. However, unclassified students may be eligible to apply specific course credits towards their degree if later admitted into the Graduate Program (see Section I.A.3.e above).

A. REGISTRATION PROCEDURES

A student who has applied to, and has been admitted by, the Graduate School registers each semester by securing registration materials from the appropriate administrative unit, seeking counsel from his/her Advisor and obtaining his/her approval (signature), properly completing and processing registration materials, and promptly making full payment when billed. A student may not attend classes until registration is completed. A graduate student receiving financial support is required to register for fifteen (15) graduate credits in the Fall and Spring semesters. Twelve (12) credits is the minimum full-time load. Registration for courses that will not be included in the student's Program of Study, requires written approval from his/her Advisor or this can result in termination of his/her UGS. An updated Program of Study must be on file in the Graduate Office at all time.

The Department of Aerospace Engineering and Engineering Mechanics has two (2) approved codes to identify which program the student is enrolled in:

Program	*Code*
Aerospace Engineering	AEEM
Engineering Mechanics	ENGM

The student should insert the appropriate code number on his/her registration form.

REGISTRATION CHANGE PROCEDURES (Drop/Add)

Once a student has completed registration, the official record can be changed only with a registration change form (Drop/Add) secured from the student's college office, to be used only when changes in a program are absolutely necessary. Such changes can be made in the regular registration period without charge. Beginning on the first day of classes of any academic period, a service fee is charged for all changes involving addition of a course, change in course section, change from graduate to undergraduate credit, change from credit to audit or vice versa, regardless of the reason. Such changes must be processed through the Office of the Registrar by Friday of the second week of classes, unless the college offering the course has established an earlier deadline. After Friday of the second week of the semester, course drops will be accepted. See Section II.E.1 for complete course withdrawal rules.

B. AUDIT REGULATIONS

The audit option is intended for cases in which coursework is desired or advised but in which a grade is deemed unnecessary by the student in consultation with the Advisor. Admissions and Conditions for participation in audit courses are at the discretion of the instructor, who is not obligated to accept a student for audit. Audited courses cannot be used to satisfy any graduate degree course requirements. An example of where an audited course may be appropriate would be for a student doing field work in a foreign country where a working knowledge of the language is needed.

Audit hours may not be charged to a UGS unless at least twelve (12) graduate credits are taken that same semester and if the total is less than nineteen (19) credits. Also, no more than one audit course per semester may be charged to a UGS.

C. PASS/FAIL

A graduate student may not take courses for graduate credit on a pass/fail basis, except when approved by the Advisor. The pass/fail option is limited to research, seminars or courses outside the requirements of the graduate program (e.g., deficiency credits, extra-school electives). Under no circumstances may a course taken on a pass/fail basis be counted towards fulfilling a graduate degree course requirement.

D. WITHDRAWALS

ACADEMIC CONSIDERATION

Dropping a class and withdrawing from a class are generally allowed until the end of the second and tenth week of the semester, respectively. Specific deadlines to drop a class and withdraw from a class in any given semester are published by the Office of the Registrar (see https://www.uc.edu/registrar/calendars). For dropped classes, the grade of "W" is assigned by the Office of the Registrar and the course is deleted from the student's official record. In the case of official withdrawal, the grade of "W" is assigned by the Office of the Registrar. For withdrawals thereafter, the instructor is required to submit a grade of "UW" (unofficial withdrawal with attendance/participation) for students who cease to attend a class following some attendance or participation and "X" (unofficial withdrawal without attendance/participation) for students who never attended any classes and did not submit any assigned work. Both types of unofficial withdrawal carries zero (0.00) quality points and is calculated into the GPA as an "F" grade.

No withdrawal is permitted after the published deadline.

Exceptions to this rule will be only with the approval of both the advisor and the Associate Dean for Graduate Studies and Research and will require both detailed and adequate justification.

Every withdrawal slip must be signed by the student's academic advisor. The advisor's signature is required so that the advisor is aware of the student's action, and to advise the student of possible academic, fiscal, or visa problems. Full time graduate students must carry at least twelve (12) graduate credits but are encouraged to take fifteen (15) graduate credits, exclusive of audits. A withdrawal which brings the student below that level places UGS support in jeopardy. The student will then become liable for the semester's tuition. International students must maintain full time status.

A student may be withdrawn by the instructor at any time in the semester when excessive absences have been incurred. A student who is withdrawn due to excessive absences is not eligible for academic credit, refund of fees, or reinstatement as an auditor in that course.

LEAVE OF ABSENCE

Students may request a leave of absence from the program, for a period of up to one year, for medical, financial, or personal reasons. Such requests must be made in writing to the GPC and must be endorsed by the student's advisor. Upon return to the program the student's status will be the same as when he/she started the leave. Students, however, are cautioned that, if they had financial aid at the time of the leave, there is no guarantee that aid will be available when they resume their studies at the end of the leave.

Unofficial leaves of absence or vacations during the academic year may not be taken. Students who do so may have their financial aid withdrawn and/or may be placed on probation or dismissed from the program by the DGC.

III. GRADUATE CREDITS AND GRADING PRACTICES

A. FULL-TIME AND PART-TIME COURSE LOAD

Unless specifically admitted as a part-time student, all graduate students are expected to carry a minimum of twelve (12) graduate credit hours (courses at the 6000 level and above) for the Fall and Spring Semesters. Students do not have to register for Summer Semester to maintain their full-time status. Students taking courses for audit must still take an additional twelve (12) graduate credit hours. The recommended course load is fifteen (15) graduate credit hours per semester. Students admitted as full-time students may request part-time status by submitting a written petition to the GPC. Approval of part-time status may not be automatic, however.

Credit can be earned for only those courses in this University listed in the current Schedule of Classes (https://webapps.uc.edu/onestop/learningopp). Most foreign students, under the terms of their visas, must be enrolled as full-time students.

B. GRADUATE ASSISTANTS AND UNIVERSITY GRADUATE SCHOLARSHIP RECIPIENTS

Any students receiving a GA, RA or UGS must carry a full credit load each semester, i.e., at least twelve (12) graduate credits, exclusive of audit credits.

Full-time students who have received a UGS or GA are required to register for fifteen (15) hours during the Fall and Spring Semesters.

The Ohio Board of Regents denies state subsidy for graduate students who have earned more than 170(?) semester graduate credit hours. Graduate students whose graduate credit hours at the University of Cincinnati exceed this limit are not eligible for financial aid from general funds (UGS and GA).

C. GRADUATE CREDIT IN 6000 AND ABOVE 6000 LEVEL COURSES

The College of Engineering and Applied Science (CEAS) has a five-year cooperative undergraduate program. Therefore, courses designated at the 1000 through 5000 levels are strictly undergraduate courses. Courses at the 6000 level are called “Dual Level Courses”, primarily graduate level, but may be taken by CEAS Seniors as technical electives. When requesting a 6000-level course, the student must specify if it is for graduate or undergraduate level credit. Courses from the 7000 through 9000 levels are strictly graduate courses.

Usually, only CEAS courses at the 6000-level taken for graduate credit and courses from 7000 through 9000 levels may be used for a graduate program. However, courses from other Colleges at the 5000 level or above may be used on a graduate program.

D. GRADING PRACTICES

The Department of Aerospace Engineering and Engineering Mechanics uses the graduate grading scales and definitions specified by the Office of the Registrar (http://www.uc.edu/registrar). If a student receives a grade of "F" in a course, the student must retake the course or its approved equivalent. Upon receiving a grade of "A", "B", or "C" after retaking the course, the "F" grade will still be considered in calculating the student's grade point average. Research credits are graded on using a Pass/Fail (P/F) basis (Grading Research Credits).

IV. DEGREE MAJORS AND RECOMMENDED COURSES

There are 3 degree majors for AEEM: i) Dynamics, Controls, and Intelligent Systems, ii) Fluid Dynamics and Propulsion Systems, and iii) Solids and Structural Mechanics. Major courses should be primarily taken from the lists below or in the AEEM department, otherwise written approval by the Graduate Committee is required.

A. RECOMMENDED COURSES

DYNAMICS, CONTROLS AND INTELLIGENT SYSTEMS

Recommended core courses for Dynamics, Control, and Intelligent Systems majors are:

20-AEEM-6003 Analytical Dynamics
20-AEEM-6015 Modern Control
20-AEEM-6022 Optimal Control
20-AEEM-6036 Spacecraft Dynamics
20-AEEM-6117 Intelligent Robotics

Additional relevant courses depending on course offerings are:

20-AEEM-6091 Flight Test Engineering
20-AEEM-6092 Advanced Aircraft Performance
20-AEEM-6093 Advanced Flight Mechanics
20-AEEM-6095 Astrodynamics
20-AEEM-6096 Fuzzy Control Systems
20-AEEM-6097 Soft Computing-based AI
20-AEEM-6098 Unmanned Aircraft Systems
20-AEEM-6099 Systems Engineering Analysis
20-AEEM-7079 Estimation of Dynamical Systems

and/or any other graduate-level CEAS courses in the area of Dynamics, Control, and Intelligent Systems. Selected courses from other departments in the Dynamics, Control, and Intelligent Systems area are also acceptable.

FLUID DYNAMICS AND PROPULSION SYSTEMS

Recommended core courses for Fluid Dynamics and Propulsion Systems majors are:

20-AEEM-6011 Combustion
20-AEEM-6041 Compressible Flow and Thermodynamics
20-AEEM-7035 Physics of Gases
20-EGFD-7041 Viscous Flow and Heat Transfer
20-EGFD-7051 Numerical Methods for Aerospace Fluid Mechanics
20-AEEM-8030 Advanced Propulsion

Additional relevant courses depending on course offerings are:

20-AEEM-6012 Gas Turbine Combustion
20-AEEM-6037C Computational Fluid Dynamics
20-AEEM-6042 Advanced Topics in Air Vehicle Propulsion
20-AEEM-6061 Sustainable Liquid Hydrogen (LH2) Power Systems
20-AEEM-6078 Turbulent Flow and Heat Transfer
20-AEEM-6121 Theory of Turbulence
20-AEEM-7065 Aeroacoustics

and/or any other graduate-level CEAS courses in the area of Fluid Dynamics and Propulsion Systems. Selected courses from other departments in the Fluid Dynamics and Propulsion Systems area are also acceptable.

SOLIDS AND STRUCTURAL MECHANICS

Recommended core courses for Solids and Structural Mechanics majors are:

20-AEEM-6001 Advanced Strength of Materials
20-AEEM-7052 Finite Element Method

Additional relevant courses depending on course offerings are:

20AEEM-7001 Engineering Elasticity
20-AEEM-7027 Nondestructive Testing
20-AEEM-7074 Advanced Finite Element Method

and/or any other graduate-level CEAS courses in the area of Solids and Structural Mechanics. Selected courses from other schools in the Solids and Structural Mechanics area are also acceptable.

ENGINEERING MECHANICS

Engineering Mechanics: Analytical Mechanics

20-AEEM-6003 Analytical Dynamics
20-AEEM-6041 Compressible Flow and Thermodynamics 20-AEEM-6001 Advanced Strength of Materials

Another graduate- level CEAS course in one of the three major principles is also acceptable.

MATHEMATICS REQUIREMENT

Graduate mathematics courses are generally taken from the Math Department 5000 and above. Your advisor should approve these courses. In some cases, appropriate mathematics courses can be found in other schools such as School of Computing Sciences and Informatics. Your advisor and the School Graduate Committee must approve these courses. A list of already approved courses is on file in the graduate office.

Special Rules for GE- ACE M.S. Programs

Graduate students enrolled in the General Electric Advanced Course in Engineering program (GEACE) receive a Non-Thesis M.S. degree with the Mini-Thesis requirement replaced by a Final Project requirement. The Final Project is conducted at GE facilities and supervised and evaluated by qualified GE personnel. A UC/GE ACE program participant can apply nine (9) semester credits of Advance Standing from the GE A and B courses to the M.S. program. From the contents of the A and B courses, three (3) credits can be applied to the mathematics requirement and six (6) credits to technical electives.

V. MASTER'S DEGREE PROGRAMS

A. TYPES OF MASTER'S DEGREES PROGRAMS

The Department of Aerospace Engineering and Engineering Mechanics offers courses of study leading to the Master of Science (M. S.) degree in both Aerospace Engineering and Engineering Mechanics. Each of these two M.S. Programs offers a Thesis and a Non-Thesis Option. The requirements for the Aerospace Engineering and Engineering Mechanics M.S. Programs are different. In each Program, the requirements are also different for the Thesis and the Non-Thesis Options. The Non-Thesis option is not available for students who receive financial aid from UC CEAS. AEEM also offers courses of study leading to the Master's of Engineering Degree (M.Eng.) in Aerospace Engineering. M.Eng. programs are centrally administered by the College of Engineering and Applied Science (CEAS).

PROGRAM REQUIREMENTS

M.S. IN AEROSPACE ENGINEERING

Three majors are available in the Aerospace Engineering Program: (i) Dynamics, Control, and Intelligent Systems (ii) Fluid Dynamics and Propulsion Systems, and (iii) Solids and Structural Mechanics. The requirements appear below.

MASTER'S OF SCIENCE IN AEROSPACE ENGINEERING ALL MAJORS		
	Thesis	Non-Thesis
Major Option	9 cr. hrs.	12 cr. hrs.
Technical Electives	6 cr. hrs.	9 cr. hrs.
Mathematics	3 cr. hrs.	6 cr. hrs.
Thesis	12 cr. hrs.	NA
M.S. Mini-Thesis	NA	3 cr. hrs.
Seminar	2 cr. hrs.	2 cr. hrs.
Total	32 cr. hrs.	32 cr. hrs.

M.S. IN ENGINEERING MECHANICS

No majors are available in the Engineering Mechanics Program. The requirements appear below.

MASTER'S OF SCIENCE IN ENGINEERING MECHANICS		
	Thesis	Non-Thesis
Dynamics, Control, and Intelligent Systems	9 cr. hrs. with at least 3 in ea area	12 cr. hrs. with at least 3 in ea area
Fluid Dyn. & Prop. Systems		
Solid Mechanics		
Technical Electives	6 cr. hrs.	9 cr. hrs.
Mathematics	3 cr. hrs.	6 cr. hrs.
Thesis	12 cr. hrs.	NA
M.S. Mini-Thesis	NA	3 cr. hrs.
Seminar	2 cr. hrs.	2 cr. hrs.
Total	32 cr. hrs.	32 cr. hrs.

NOTES FOR BOTH M.S. PROGRAMS

Program of Study

The student must prepare a **Program of Study** in consultation with a temporary advisor **during the first two months** of the semester in which the student first enrolls. A copy of the Program of Study must be provided to the Graduate Office. The student must select a permanent advisor by the end of the first semester after admission. If necessary the Program of Study should be revised and a copy given to the Graduate Office. Future financial support may depend on the completion of the Program of Study. Classes not included on the Program of Study will not be counted toward the student's degree unless the Program of Study is amended and signed by the advisor. Taking courses not in the Program of Study and not approved by the advisor may result in termination of financial aid.

Petitions

If a student wishes to petition for a waiver from the curriculum rules, they must have signed approval from their advisor and their Graduate Committee representative prior to submitting the petition to the Department Graduate Committee.

Reading Courses

M.S students may take up to one 3-credit-hour Reading Course as approved by their advisor. Ph.D. students may take an additional six credit hours of Reading Courses as approved by their advisor.

Seminar Requirement

Department rules specify that two (2) graduate credits for seminar are required at the M.S. and Ph.D. levels. Registration for the seminar is for two semesters, generally the semesters of the first year during which the student first registers. A grade of "P" is assigned at the

end of each semester when the Seminar is completed successfully. Students must attend all seminars each semester. For part-time students, this seminar requirement may be spread over several academic years. For the GE-ACE students this requirement is reduced to one (1) credit. In exceptional cases where conflicts or other business preclude attendance to the seminars, the seminar director should be notified and suitable alternate arrangements be made.

M. ENG. IN AEROSPACE ENGINEERING

UC College of Engineering and Applied Sciences offers a Master's of Engineering (M.Eng) degree program (see https://ceas.uc.edu/academics/degrees- programs/master-of-engineering.html). The M.Eng. program is designed to provide students with advanced knowledge and experience in their fields of interest along with courses covering new developments in the respective disciplines. AEEM offers courses of study leading to M.Eng. in Aerospace Engineering. The coursework requirements for this degree track are listed below.

MASTER'S OF ENGINEERING IN AEROSPACE ENGINEERING		
M. Eng Core Courses		9 cr. hrs.
Track Courses		12 cr hrs.
Elective Courses		6 cr. hrs.
Capstone Project		3 cr. hrs.
Total		30 cr. hrs.

Students enrolled in the Aerospace Engineering M.Eng. program must select four track courses from the list below and two additional elective dual-level or graduate courses offered in CEAS.

20-AEEM-6001 Advanced Strength of Materials
20-AEEM-6003 Analytical Dynamics
20-AEEM-6011 Combustion
20-AEEM-6015 Modern Control
20-AEEM-6041 Compressible Flow and Thermodynamics
20-AEEM-6099 Systems Engineering Analysis
20-AEEM-7052 Finite Element Method

MINIMUM ACADEMIC PERFORMANCE

The ***UC Graduate Handbook*** states that graduate students must receive a minimum grade of a "C" or "P" in all coursework to receive graduate credit. In addition, 2/3 of the minimum graduate credits necessary for the degree must be at a grade level of "B" or higher.

The Department of Aerospace Engineering and Engineering Mechanics also has established the following requirements:

A Master's degree student must achieve an overall average of "B" on all graduate coursework. A student in AEEM **may be dismissed if their overall technical coursework GPA falls below 3.0.**

If coursework is repeated all grades of a repeated course count toward these requirements.

The graduate student's grades will be reviewed by the DGC once they become available after the end of each semester. All graduate students with grade deficiencies will be notified by the GPC and reminded of the above requirements.

CANDIDACY

Students are not required to submit a formal application for Master's candidacy. A student becomes a candidate for the Master's Degree upon matriculation in the Master's Program in which he/she has been admitted. To maintain status as a graduate student and thus be eligible for a graduate degree, students must register for at least one (1) credit each academic year during the Fall Semester. (See Section II.E on withdrawals and leaves.) International students must register for at least one (1) credit hour each semester, except for the summer.

TIME LIMITATIONS

The minimum requirement for the Master's Degree is the equivalent of one academic year of fulltime graduate study. The UC Graduate Handbook states that a student pursuing a program leading to a Master's Degree must complete all requirements no later than five (5) years from the date of acceptance in that degree program.

B. RESEARCH PROJECTS, THESIS AND EXAMINATIONS

THESIS RESEARCH PROJECTS

A student electing a Master's Degree with thesis will select a research advisor and a Thesis Committee. The committee normally consists of the research advisor and at least two other appropriate representatives, see ***UC Graduate Handbook*** for more details. The student will then select a research project in consultation with the research advisor and with approval of his/her Thesis Committee. The advisor and the committee have the responsibility to see that the project is carried out under currently accepted scientific standards. Upon completion of the research, a thesis will be prepared and defended orally in public. A grade of "P" should be given if applicable.

THESIS PREPARATION AND SUBMISSION

The ***UC Graduate Handbook*** provides graduate degree candidates with detailed information concerning the written/electronic form of the thesis and the mechanics of preparing the final manuscript and abstract. Regulations regarding electronic submission are also available from the Graduate Office.

When a thesis has been approved, the candidate for the master's degree will be required to follow the thesis submission procedures detailed on the Graduate School website entitled Electronic Thesis/Dissertation Information (http://grad.uc.edu/student-life/etd.html). Students are responsible for reviewing the most current and detailed instructions on the website referenced above and for full compliance with those regulations.

Timeline for Thesis Submission to Committee

When the thesis work is essentially complete, a final draft is prepared. In general, the thesis will have gone through several preliminary drafts, and the Advisory and Examining Committee will have set forth specific requirements concerning the final draft. The student should allow the Advisory and Examining Committee ample time to review the work. The final draft is submitted to the Thesis Committee for critical review no later than 2 weeks prior to the oral defense, although one month is best practice. Additionally, the oral defense of the thesis should be completed no later than 2 weeks before the ETD submission deadline for the semester. Failure to comply with these deadlines may thesis completion until the next semester

THESIS DEFENSE

Prior to graduation, the thesis student will give an oral defense. In this defense the student will give a 30- to 45-minute presentation of his/her thesis to the Thesis Committee. After the thesis presentation, the student will be questioned by the Committee on both the thesis and the subject matter related to the thesis topic. Successful completion of this defense and the courses required in this program plus electronic submission of the thesis (in accordance with the rules of the CEAS and the Graduate School) constitute completion of the requirement for the Master of Science degree.

If the defense is failed, the student may repeat the defense at a later date to be arranged through his/her Advisor. A second failure of the defense is disqualifying.

The final version of the M.S. Thesis ready for electronic publication must be submitted to the Graduate School no later than the published date.

FINAL EVALUATION

According the ***UC Graduate Handbook***, each master's degree student must undergo

an individual evaluation process at the end of his or her program. The nature of the final evaluation is to be established by each school. For M.S. students a thesis, along with the oral defense, constitutes a final evaluation. Students enrolled in a Non-Thesis M.S. program must submit a mini-thesis. GE-ACE students enrolled in a Non-Thesis M.S. program must conduct a final project and have the project report approved by qualified GE personnel.

The Department of Aerospace Engineering and Engineering Mechanics has established the following method for conducting final evaluation in a Non-Thesis M.S. program. The student must prepare a mini-thesis that is supervised by a committee including the **Advisor and at least one additional faculty member**. The student must have written approval from the mini-thesis committee and submit this approval to the DGC.

This project may be: (1) an extensive review of a technical paper or other technical work, (2) a state-of-the-art review in a specific technical discipline, or (3) any other appropriate investigation as approved by the mini-thesis committee. The procedure to be followed by the student is:

- Identify a faculty member who will serve as mini-thesis Advisor
- Register for two (2) credit hours for the course 20-AEEM-9070 Research (**under the appropriate section for the chosen mini-thesis Advisor**)
- Within four weeks after registration the student will prepare a one-page proposal describing work to be performed under this project. **This is to be approved by the student's mini-thesis committee**

The result of this project is a written report submitted to the committee. If approved by the committee, the Advisor is to register a grade of "P" for the project. If any dispute arises as to satisfactory completion of a project, the DGC can act to approve or disapprove the project. **A copy of the approved mini-thesis project should be forwarded to the GPC**.

C. GRADUATION

Upon successful completion of the mini-thesis or thesis defense, the Research Advisor will forward a letter to the Graduate Program Chair certifying that the student has completed all requirements for the degree. The letter must be accompanied by a duplicate copy of the front page of the mini-thesis or thesis, signed by the members of the Research Advisory Committee and a completed "Certification For Graduation Form". The GPC will sign the form and forward it to the Graduate Office.

Each student who has successfully completed all requirements for any of the Master's Degree Programs in the Department of Aerospace Engineering and Engineering Mechanics should apply to the office of the Graduate School for graduation. **It is the responsibility of the student to ensure that all forms, procedures and regulations required by that office for graduation are fulfilled**. See the Chapter entitled "Graduation" in the ***UC***

Graduate Handbook for these requirements.

VI. DOCTORAL DEGREE PROGRAM

A. COURSE OF STUDY

The Department of Aerospace Engineering and Engineering Mechanics offers courses of study leading to the Ph.D. degree in both Aerospace Engineering and Engineering Mechanics. Three majors are available in the Aerospace Engineering Program: (i) Dynamics and Controls, (ii) Fluid Dynamics and Propulsion Systems, and (iii) Solids and Structural Mechanics. Majors available in the Engineering Mechanics Program are (i) Dynamics, (ii) Fluid Dynamics, and (iii) Solids and Structural Mechanics.

A prospective candidate for the doctorate follows a plan of full-time study that ordinarily lasts three (3) years beyond a Master's Degree.

- The first year of study is generally directed toward completing most of the coursework in the major area of study and mathematics, and passing the Ph.D. Qualifying Examination.
- The second year of study is aimed toward completing all coursework, initiating a dissertation research project, and completing the Ph.D. Dissertation Proposal.
- The third year, and any subsequent years of study, is generally focused on completing the dissertation.

All full-time and part-time students who earn their M.S. degree in the Department of Aerospace Engineering and Engineering Mechanics and who wish to continue their studies toward the Ph.D. degree must **petition to the DGC for admission to the Ph.D. Programs**.

Immediately upon a student's declaration of intent to pursue registration and study leading towards the Ph.D. degree, an advisor will be selected by the student subject to the approval of the DGC. The faculty member selected must be from the area in which the student wishes to major. The faculty advisor will usually become the Dissertation Advisor and assist the student in the formation of a Dissertation Committee once the student has passed the Qualifying Examination (see Section V.G below). A Ph.D. Dissertation Proposal, duly signed by the Dissertation Committee, must be submitted to the School Graduate Committee for approval no later than one year prior to graduation (see Section V.G below).

The Dissertation Committee, together with the student, will prepare the student's program of study and submit it to the DGC for their information and review. The student and his/her committee will endeavor to draft a program with a central emphasis on a major option in Aerospace Engineering or Engineering Mechanics with mathematics and a minor option in AEEM or another appropriate school in CEAS.

An important function of the Dissertation Committee is to supervise the student's program of study. The student may request a meeting with the Dissertation Committee when there is an important academic matter to discuss.

B. CREDIT HOURS REQUIREMENTS

A student is required to satisfactorily complete a minimum of (90) semester credits beyond the Bachelor's degree and a minimum of (60) semester credits beyond the Master's degree requirements, whichever is greater. Work in the major option should represent at least (24) credit hours of study beyond the Bachelor's degree, not counting credits for thesis and dissertation, and with at least (12) credits in 6000 level or above courses. One minor of (9) credits, (9) credits of Mathematics hours, (6) credits of technical electives, plus (40) credits of research, with at least (30) credits of Ph.D. Dissertation Research are also required as well as (2) credits for registration in the Department seminar after M.S. degree. These requirements are summarized below.

DOCTOR OF PHILOSOPHY IN AEROSPACE ENGINEERING OR ENGINEERING MECHANICS AFTER B.S.	
Major Option	18 cr. hrs. with at least 9 cr. hrs. in 7000 or above courses
Technical Electives	6 cr. hrs.
Mathematics	6 cr. hrs.
Ph.D. Research	58 cr. hrs. with at least 48 cr. hrs. in Ph.D. Dissertation Research
Seminar	2 cr. hrs.
Total	90 cr. hrs.

DOCTOR OF PHILOSOPHY IN AEROSPACE ENGINEERING OR ENGINEERING MECHANICS AFTER M.S.	
Major Option	9 cr. hrs. with at least 6 cr. hrs. in 7000 or above courses
Technical Electives	6 cr. hrs.
Mathematics	3 cr. hrs.
Ph.D. Research	46 cr. hrs. with at least 38 cr. hrs. in Ph.D. Dissertation Research
Seminar	2 cr. hrs.
Total	66 cr. hrs.

MINIMUM ACADEMIC PERFORMANCE

The ***UC Graduate Handbook*** states under ***Graduate Credit Policies*** that graduate students must receive a minimum grade of a "C" or "P" in all coursework to earn graduate credit. In addition, AEEM also has established the following requirements:

A doctoral student must maintain an overall Grade Point Average (GPA) of 3.0 or greater on all graduate coursework as well as a 3.0 or greater GPA for coursework in their major area of study. A student in the Aerospace Engineering or Engineering Mechanics Ph.D. degree programs **may be dismissed** if his/her coursework GPA falls below 3.0.

Coursework is defined explicitly to exclude research credits and the graduate seminar, since they are graded on a Pass/Fail basis.

If coursework is repeated, all grades of a repeated course count toward these requirements.

The grades of each graduate student will be reviewed by the DGC once they become available after the end of each semester. All graduate students with grade deficiencies will be notified by the GPC and reminded of the above requirements.

C. RESIDENCY

The ***UC Graduate Handbook*** stipulates under ***Residency*** that all doctoral students must meet a residency requirement. The minimum requirement consists of enrollment in at least ten (10) graduate credit hours per semester for two out of four consecutive semesters, including the summer semester(?), so long as the student registers for at least twelve (12) credit hours in each Fall Semester involved.

D. PH.D. CANDIDACY

All doctoral students in the Department of Aerospace Engineering and Engineering Mechanics are required to pass a candidacy examination, hereafter referred to as Ph.D. Qualifying Examination, in accordance with the rules and guidelines of the *UC Graduate Handbook under Candidacy*. In order to take the exam a doctoral student must meet or exceed the Minimum Academic Performance rules earlier listed in Section V.C. In addition, the student can have no more than two (2) I/NG grades.

Passing the exam is only one of the requirements for candidacy (see UC Graduate Handbook under Candidacy and Section V.G below).

The Ph.D. Qualifying Examination will consist of two parts: submission of a research paper and an oral examination to be given only after the research paper has received a positive assessment by the Exam Committee. The objective of the examination is to establish the student's:

1. understanding engineering concepts and ability to apply concepts in research and design
2. ability to critically analyze an engineering problem;
3. ability to organize and communicate original research produced by the student;
4. ability to answer questions related to a defined body of knowledge.

It is expected that the student shows a thorough understanding of underlying physical/mathematical concepts and is expected to demonstrate the ability to successfully complete an original research dissertation.

Any graduate student, whether holding a M.S. degree or not, who has declared his/her intention to pursue a Ph.D. degree is considered a doctoral student and as such is required to pass the Ph.D. Qualifying Examination and is subject to the requirements of this Section.

Time Requirements

The Ph.D. Qualifying Examination is given throughout the academic year.

A student entering the doctoral program must pass the exam no later than two years after entrance into the Ph.D. program. This time is extended to three years for students without a master's degree due to the larger number of course credits required. A student may not take the Ph.D. Qualifying Exam more than two times and may be denied a retake due to poor performance on the first try (see Section V.E.4.c below), or if this retake would violate the above time requirements. In exceptional cases the time requirements specified above may be waived upon petition to the Graduate Program Chair (see Section V.E.2 below).

Petition Requirements

A student wishing to depart from the time requirements stated above must notify the Department Graduate Committee by petition of his/her intentions. This written petition, detailing the reasons for the departure, must be received and approved within 18 months from his/her entrance into the Ph.D. program.

A student wishing to take the Qualifying Examination must notify the School Graduate Secretary using the form provided by that office. On the form, the student must indicate his/her major area and must secure the signature of a faculty member who has agreed to act as the student's dissertation advisor after the student has passed the examination.

As listed above, approved Department major areas of study are (i) Dynamics & Controls; (ii) Fluid Mechanics & Propulsion Systems; or (iii) Solids & Structural Mechanics.

Additional Information

Foreign students subject to TOEFL requirements are strongly urged to pass the Oral English Proficiency Exam before taking the Ph.D. Qualifying Examination because of the language skills required for the oral portions of the exam.

The Ph.D. Qualifying Examination

In order to pass the Ph.D. Qualifying Examination, the student shall demonstrate a superior ability to solve research-oriented problems with guidance in a field relevant to Aerospace Engineering and Engineering Mechanics. The phrase "with guidance" is included to recognize that a student at this stage in his/her pursuit of a doctorate degree is not expected to conduct research without supervision; rather the expectation is that under the guidance of the advisor, the student has a superior ability to solve research-oriented problems.

The exam will consist of two parts:

1. a research paper
2. an oral examination

The oral examination is taken only if a passing grade is achieved on the research paper. The qualifying exam committee will evaluate the research paper and the oral presentation.

Ph.D. Qualifying Exam committee

The committee will be formed by a minimum of three (3) Department faculty members of the student's major area.

Research Paper

The research paper will be prepared in accordance with the best practices for preparing peer reviewed journal papers and will be evaluated based on:

1. **Interest:** The paper must address a topic of significant importance to the fields of aerospace engineering or engineering mechanics
2. **Novelty:** The paper must present original methods or results which are not available in the open literature
3. **Validity:** The paper must be accurate and free from errors

The Exam Committee members will provide written evaluation of the quality of the work based on the three criteria above and vote on the passing of the written portion. A consensus vote is required to pass. Students failing the evaluation will be given the possibility of resubmitting the research paper for a second and final time within six months subject to the time limitations of Section V.E.1.

If the paper has been accepted for publication in a peer reviewed journal or equivalent prior

to the Qualifying exam, the review stage may not be required. If the Exam Committee members agree that the journal has acceptable standards and reputation in the field, the student can directly proceed to the oral portion provided that he/she is the first author of the paper and that the work was conducted at UC under the direct guidance of the advisor.

Oral Exam

The student must schedule the oral examination as described below. At the oral exam, the student will present an uninterrupted seminar open to all faculty and students of twenty (20) minutes in length. The oral exam will be based on the research paper evaluated by the Qualifying Exam Committee.

The presentation will be prepared in accordance with the best practices for preparing presentations for conferences and seminars. Besides the clarity and conciseness of the presentation the exam will establish the student's ability to respond to questions aimed at assessing:

1. Critical thinking skills
2. Understanding of technical material and fundamental knowledge in the field
3. Ability to relate their research to the field as a whole

The question and answer period will typically last thirty to sixty minutes and is open only to the Department faculty and any designated persons outside the faculty to whom the Department faculty present indicate no objections.

Upon completion of the oral examination, the Exam Committee members will vote on the outcome of the examination using the criteria found above. A consensus vote is required in order to pass. The oral examination will be given once, unless the examiners, by consensus vote, recommend a second and final oral presentation. If a second oral exam is recommended, it must be completed before the end of the following semester. A student who does not pass the oral examination will be given a chance to retake the Qualifying Examination, subject to the time limitations of Section V.E.1 above.

Procedure

An application to take the Ph.D. Qualifying Examination must be completed and returned to the Graduate Office. At the same time the student must submit the research paper to the Exam Committee. Within two weeks from submission the Exam Committee will vote on the research paper and communicate the result to the Graduate Program Chair. The seminar must be scheduled by the student and registered with the Graduate Office no later than two weeks after notification of having passed the research paper review. The notification to the Graduate Office must include an indication, either via a faculty sign-off sheet or by email messages to the Graduate Program Chair, that the scheduled time for the seminar is acceptable to a majority of faculty members in the major area of study. It is expected that

the student will work diligently to find a time suitable for as many faculty as possible, not just a simple majority. A written seminar announcement stating the time and place of the presentation must be distributed to all members of the faculty at least one week before the scheduled date.

All Department faculty members are welcome, as are other persons to whom the faculty members present have no objection. All the Exam Committee members must be present.

Failure of the student to meet any of the requirements stated in this section is justification for failure of the Ph.D. Qualifying Examination.

Change of Major

If a student changes major area of study, the entire Ph.D. Qualifying Examination must be repeated.

E. Ph.D. DISSERTATION PROPOSAL

All doctoral students in the Department of Aerospace Engineering and Engineering Mechanics who have passed the Ph.D. Qualifying Examination must have a Dissertation Proposal accepted before they can be admitted into candidacy in accordance with the rules and guidelines of the Graduate School as set forth in the ***UC Graduate Handbook*** under ***Candidacy***.

The purpose of the Dissertation Proposal is to ascertain the appropriateness of the student's proposed research to constitute a Doctoral Dissertation as well as the student's ability to carry through with the proposed research. The following specific rules and regulations govern the Dissertation Proposal in the Department of Aerospace Engineering and Engineering Mechanics.

TIME REQUIREMENTS

No later than the end of the semester immediately following the semester during which a student has passed the Ph.D. Qualifying Examination, he/she must select a Dissertation Advisor.

At least **one year** prior to graduation, the student must have a Dissertation Proposal presented to and accepted by his/her Dissertation Committee. A completion form must be submitted to the GPC at that time. Forms are available in the Graduate Office. Recall, that only five (5) years are allowed prior to Ph.D. candidacy (see Section V.G below).

The choices of a Dissertation Advisor and Dissertation Committee will be communicated to the GPC by the student no later than the end of the second semester following the semester during which he/she has passed the Ph.D. Qualifying Examination, using the appropriate form (which may be obtained from the Graduate Administrative Coordinator), and securing on the form the signatures of the Advisor and Committee Members.

A student who changes Dissertation Advisor and/or Dissertation Committee must still satisfy the latest of these time requirements and have an accepted Dissertation Proposal no later than during the third semester following the semester during which he/she has passed the Ph.D. Qualifying Examination.

The timeline below summarizes the above time requirements. In exceptional cases the time requirements specified above may be waived upon petition to the GPC (see following Section V.F.2 below).

Semester 0	**Semester 1**	**Semester 2**	**Semester 3**
Student passes Ph.D. Qualifying Exam	Student has selected Dissertation Advisor	Student has selected Dissertation Committee and notified GPC	Student's Dissertation Proposal has been presented and accepted **(At Least One Year prior to Graduation)**

PETITION REQUIREMENTS

A student wishing to depart from the time requirements of Section V.F.1 above shall notify, by petition, the Graduate Program Chair of his/her intentions. This **written petition**, detailing the reasons for the departure, should be received and approved **prior** to the expiration of the time requirement for which departure is requested.

Ph.D. DISSERTATION PROPOSAL

A Dissertation Proposal is a typed document detailing the student's proposed dissertation research. The student is required to present orally the Dissertation Proposal to his/her Dissertation Committee. **The Dissertation Proposal must be distributed by the student to the members of their Dissertation Committee at least one week prior to the oral presentation.**

The Dissertation Proposal should be no longer than 40 pages summarizing

- objectives, milestones, and outcomes of the proposed dissertation research
- completed and proposed work
- timeline for completion
- outline for the dissertation chapters.
- publications (completed and planned)

After the oral presentation, the Dissertation Committee shall evaluate the Dissertation Proposal and accept or reject it. The evaluation criteria are:

1. the scientific merits of the proposed research
    a. in particular, the originality and contribution to the state of the art in the discipline of the proposed research
2. the realism and reasonableness of the proposed research
3. the qualifications of the student to conduct the proposed research

The result of this evaluation shall be communicated in writing by the Dissertation Advisor, with signatures from all members of the Dissertation Committee, to the Graduate Program Chair. A copy of the Dissertation Proposal shall be attached to this written evaluation and both will be included in the student's school file.

A doctoral student is not allowed to have more than one rejection of a Dissertation Proposal. Thus, a student who has had a proposal rejected twice or two proposals rejected once shall be asked to leave the school doctoral program.

CANDIDACY AND TIME LIMITATIONS

A student admitted to the Ph.D. program becomes a Ph.D. candidate when he/she has satisfactorily completed all required coursework beyond the M.S. degree and has passed the Candidacy Exam (Ph.D. Qualifying Examination). As stated in the ***UC Graduate Handbook*** under ***Candidacy*** (Doctoral Degree Program), a doctoral student shall be admitted into candidacy when he/she has:

1. achieved and maintained a GPA of atleast 3.0 in all doctoral coursework
2. passed the school Qualifying Examination
3. acceptance of dissertation proposal
4. accumulated at least the minimum total of graduate credits specified by the student's academic program

The student who has completed all requirements for candidacy will be officially admitted into candidacy when the school fills out the proper candidacy forms, **including the Dissertation Advisor and Committee form,** and submits them for inclusion in the student's official record.

The doctoral degree will be granted for no less than the equivalent of three (3) years of full-time graduate study.

The maximum time limit for doctoral degree completion is five (5) years to candidacy and four (4) years from candidacy to degree completion, so the overall maximum time limit for doctoral degree completion is nine (9) years.

Candidacy for the doctorate automatically terminates after four (4) consecutive calendar years. Candidates may petition to the Graduate School through their school, college, and the Dean of the Graduate School for extension of candidacy prior to its expiration or for reinstatement if candidacy has expired. If reinstatement is approved, **the student will be readmitted to candidacy only after satisfying the formal candidacy examination requirements administered by the school**.

Registration and fee payment for at least one credit hour in the Fall Semester is required for each student if his/her candidacy is not to lapse.

Students who interrupt their graduate studies by withdrawing from the University, either officially or by failing to register for an entire academic year, will be held responsible for the graduate program requirements in force and published at the time they re-enter that program.

F. DISSERTATION

DISSERTATION ADVISOR AND COMMITTEE

The student in consultation with the Dissertation Advisor should form a Dissertation Committeee that includes at least two additional faculty members after he/she passes the qualifying exam. At least one member of the committee, other than the advisor, must be a member of the Department of Aerospace Engineering and Engineering Mechanics. If the advisor is from outside AEEM, a faculty member from AEEM will serve as co-chairperson of the Committee.

In accordance with the ***UC Graduate Handbook*** under ***Dissertation,*** the dissertation committee must consist of at least three (3) full-time faculty members with professorial rank (tenure-track assistant, associate and full professors – **not adjunct, visiting, retired or emeriti**), at least one of which is a member of the Graduate Faculty. Research faculty may serve on the committee or chair the committee. If the chairperson is not a member of the Graduate Faculty, at least two other members must be. If a faculty member or appropriate professional practitioner has special expertise in a dissertation topic, such a person may be added to the dissertation committee if he or she is nominated by the candidate and approved by both the chairperson of the dissertation committee and the Graduate Program Chair for the academic unit (AEEM) involved. Such a person would serve as a full voting member of the dissertation committee without compensation from the University of the candidate.

See Section V.A above for selection and functioning of the Advisory Committee.

FINAL DEFENSE OF DISSERTATION

After completing the dissertation, the candidate will give an oral presentation of the dissertation to the Dissertation Committee and any other interested (or appointed) members of the Graduate Faculty of the University in an open seminar. The date of this presentation will be arranged by the Dissertation Advisor and the student will work with the department to publicly announce the defense 2 weeks in advance. When a dissertation has been approved, the candidate for the Ph.D. degree will be required to follow the dissertation submission procedures outlined in Section V.H.3 below. A grade of "P" should be given for completion of the PhD research requirement.

Timeline for Dissertation Submission to Committee

When the dissertation is complete, after review and revisions, he student should allow the Dissertation Committee ample time to review the work. The final draft is submitted to the Dissertation Committee for critical review **no later than 2 weeks prior to the oral defense**, although one month is best practice. The oral defense of the dissertation should be completed **no later than 2 weeks before the ETD submission deadline**. Failure to comply with these deadlines may delay thesis completion until the next semester.

PUBLICATION OF DISSERTATION

After a successful defense, the Ph.D. candidate will be required to follow the dissertation submission procedures detailed on the Graduate School website entitled Electronic Thesis/Dissertation Information (http://grad.uc.edu/student- life/etd.html). Students are responsible for reviewing the most current and detailed instructions on the website referenced above and for full compliance with those regulations. The final version of the Ph.D. Dissertation ready for electronic publication as well as other documents required for graduation, which are available from the Graduate Office, must be submitted to the Graduate School no later than the published date. **It is the responsibility of the student to see that he/she is in compliance with all submission and graduation regulations**.

G. GRADUATION

Upon successful completion of the Dissertation defense, the Dissertation Advisor will forward a letter to the Graduate Program Chair certifying that the student has completed all requirements for the degree. The letter must be accompanied by a duplicate copy of the front page of the dissertation, signed by the members of the examining committee and a completed Certification for Graduation Form. The Graduate Program Chair will sign the form and forward it to the CEAS Graduate Studies Office.

Each student who has successfully completed all requirements for any of the Ph.D. Programs in the Department of Aerospace Engineering and Engineering Mechanics may apply to the Graduate School for graduation. **It is the responsibility of the student to ensure all forms, procedures and regulations required by that office for graduation are fulfilled**. See the ***UC Graduate Handbook*** under ***Graduation*** for these requirements.

VII. SPECIAL RULES AND PROVISIONS

A. NONDISCRIMINATION POLICY

The Department of Aerospace Engineering and Engineering Mechanics reaffirms the University of Cincinnati policy that discrimination on the basis of race, color, religion, national origin, sex, sexual orientation, handicap or age will neither be practiced nor tolerated in any of its activities. Complaints involving discrimination should be directed to the Graduate Program Chair and/or the Director of the School.

B. RIGHT TO REVIEW RECORDS

Students, once enrolled, have the right to review their educational records, except for those excluded by law, such as those maintained by a physician or psychiatrist, or parent's financial statement. Educational records are maintained in such offices as the Office of the Registrar/Student Records, Office of the Dean of CEAS, CEAS Graduate Studies Office, UC Student Financial Aid Office, Division of Professional Practice, as well as in the AEEM Office.

In order to gain a review of such records, along with any appropriate explanation or interpretation, the student should first address the proper University or College office. In the Department of Aerospace Engineering and Engineering Mechanics, files are maintained which include: (a) the original application for admission; (b) university personnel payroll forms; (c) university grade forms; (d) Research Advisor and Research Advisory Committee progress reports and letters; (e) copies of all correspondence from the Graduate Program Chair and School Director; (f) results of candidacy examinations; (g) certification of candidacy and graduation forms; (h) a copy of the front page of the thesis/dissertation signed by the student's RAC. Students wishing to review these files must submit a request with the GPC. If the student feels there are inaccuracies, he/she may place a letter of explanation in the file.

C. GRIEVANCE PROCEDURES

Each student shall receive a copy of the university document entitled ***Graduate Student Grievance*** Procedures at the time of entrance into the graduate program. Copies will be made available at the new graduate student orientation program conducted in August of each year. Other copies are available in the School Office and from the AEEM Graduate Student Association. The Department of Aerospace Engineering and Engineering Mechanics reaffirms its adherence to these procedures.

At any time, a graduate student may petition the Graduate Committee to hear a grievance on any matter concerning the Graduate Program (probation, teaching duties, examinations, use of school equipment, etc.) and the DGC will attempt to resolve the issue. However, the student has the right to pursue any and all procedures available outside of the Department.

D. ACADEMIC DISHONESTY

Academic dishonesty in any form is a serious offense and cannot be tolerated in an academic community. Dishonesty in any form, including cheating, plagiarism, deception of effort, unauthorized assistance, or manufacturing of data may result in a failing grade in a course or graduate research credits, and/or immediate suspension or dismissal, as described under ***Academic Dishonesty, Student Code of Conduct, and Research Misconduct*** in the ***UC Graduate Handbook***

E. IMPLEMENTATION OF PROVISIONS OF THIS HANDBOOK

The provisions of this handbook have been previously adopted by the Department of Aerospace Engineering and Engineering Mechanics and were contained in preceding school documents and minutes of the DGC or the AEEM faculty meetings. Provisions not specifically addressed in this and earlier documents follow those of the ***UC Graduate Handbook***.

The current ***Graduate Handbook of the Department of Aerospace Engineering and Engineering Mechanics*** is adopted as the official graduate procedures as of 08/01/12. All graduate students entering or reentering a graduate program in the Department of Aerospace Engineering and Engineering Mechanics after that date are subject to all the rules and regulations herein.

VIII. APPENDICES

COURSE REQUIREMENTS FOR NON-ENGINEERING B.S. STUDENTS

All students entering the M.S. and Ph.D. programs in Aerospace Engineering or Engineering Mechanics must have taken the equivalent of, or demonstrated proficiency in, the following subjects (equivalent UC course numbers are shown in parentheses):

1. Calculus (15-MATH-1061 and -1062))
2. Fluid Mechanics (20- MECH-3011)
3. Thermodynamics (20-MECH-2010)
4. Dynamics (20-AEEM-2032)
5. Mechanics of Solids (20-AEEM-4052)

This is considered **minimum proficiency** for all students. A student may need additional remedial work to satisfy or to prepare for advanced work in their field of study. This must be arranged in consultation with their respective advisor.