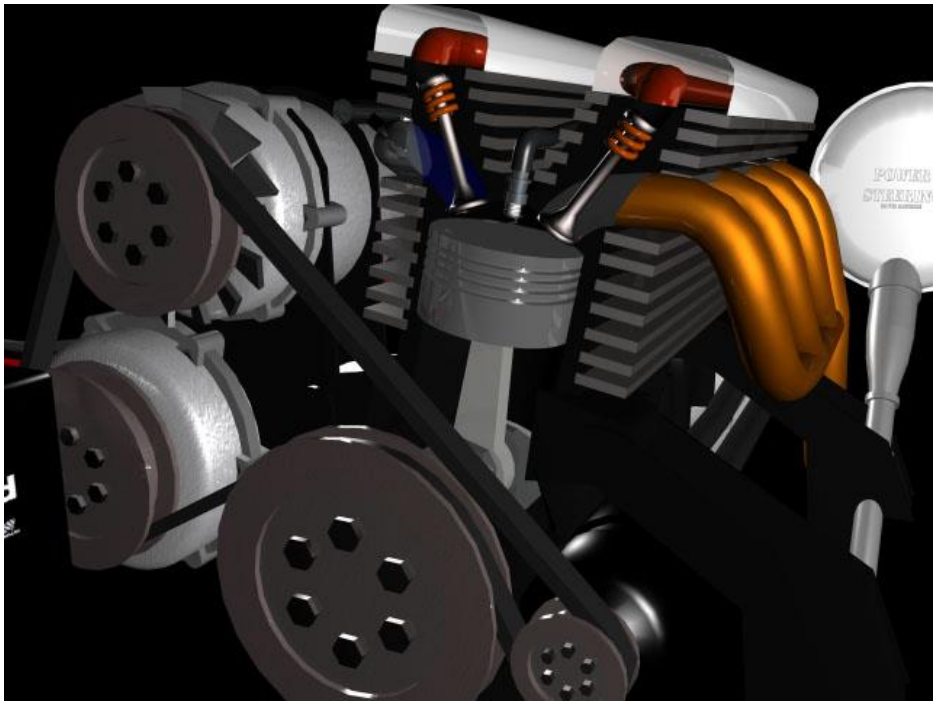
GRADUATE STUDENT HANDBOOK



Department of Mechanical Engineering

The University of South Carolina

May 2016

MECHANICAL ENGINEERING GRADUATE STUDENT HANDBOOK

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PART I. GENERAL INFORMATION

A. SOURCES OF INFORMATION

This Handbook is intended to assist Department of Mechanical Engineering (DME) graduate students at The University of South Carolina (USC) and is a supplement to the material contained in the USC Graduate Studies Bulletin (http://bulletin.sc.edu/). The rules and regulations in the Bulletin govern all graduate students at USC. **All graduate students must carefully read the Graduate Bulletin and this Handbook.**

Other general sources of information published by USC include the following:

1. Master Schedule of Classes currently offered
   https://ssb.onecarolina.sc.edu/BANP/bwckschd.p_disp_dyn_sched

2. Master's Thesis and Doctoral Dissertation Guidelines
   http://gradschool.sc.edu/students/thesisdiss.asp

Additional information can be obtained from the Graduate School (http://www.gradschool.sc.edu/).

You may also contact Ms. Renee Jenkins (email address: jenkinsr@cec.sc.edu) of the DME Student Services Office for issues related to graduate records and forms, and Dr. David Rocheleau (email address: rocheleau@sc.edu), DME Graduate Director and chair of the DME Graduate Studies Committee, if you have questions about graduate policies.

B. ADMISSIONS

The Department of Mechanical Engineering offers eight graduate degree programs: Master of Science (M.S.) in Mechanical Engineering, Nuclear Engineering and Aerospace Engineering; Master of Engineering (M.E.—non-thesis) in Mechanical Engineering, Nuclear Engineering and Aerospace Engineering, and Doctor of Philosophy (Ph.D.) in Mechanical Engineering and in Nuclear Engineering. The Graduate School, based on recommendations from the department, grants admissions to these degree programs. All applications to the degree programs must be processed through the Graduate School office on the Columbia campus. All applications must be completed online—no applications are accepted via postal mail—perspective students can find more information at: http://gradschool.sc.edu/prospective/

USC admission standards are described in the USC Graduate Studies Bulletin. Specific admission requirements for graduate degree programs offered by DME are described below.

Admission Requirements

In general, the admission processes for the ME, MS, and PhD programs in Mechanical Engineering Nuclear Engineering and Aerospace Engineering are highly competitive. Admission decisions are based on the quality of the applicant's previous university-level academic work as reflected by grade point average or GPA, letters of recommendation, GRE scores, and other evidence of past accomplishments. GRE General Test scores must be submitted by (1) all applicants seeking

assistantships and/or tuition support, (2) all applicants applying for a research based degree program (PhD or MS), and are recommended for all other applicants as well.

International applicants must also submit TOEFL or the IELTS Intl. Academic Course Type 2 exam scores. The minimum required TOEFL and IELTS scores are set by the graduate school and can be found here: http://sc_original.catalog.acalog.com/content.php?catoid=90&navoid=10661

Target Minimum Admission Standards

The entire application file is considered when reviewing for admission; that said, the following target minimum standards are used during the admission decision process.

- Undergraduate Engineering GPA ≥ 3.0/4.0
- GRE Verbal ≥ 150 (450 old scale)
- GRE Quantitative ≥ 155 (700 old scale)
- TOEFL ≥ 80
- IELTS ≥ 6.5

An applicant whose native language is not English is required to submit a satisfactory score on TOEFL or IELTS.

C. ADVISEMENT

The temporary academic advisor for all new graduate students is assigned by the Graduate Director. A permanent Major Advisor (the Academic Advisor) should be chosen after consultation with faculty members whose interests are close to those of the student. Teaching Assistants (TAs) and Research Assistants (RAs) will also have a faculty member who acts as a supervisor for their work. This person may or may not be the student's Major Advisor.

D. GRADUATE COMMITTEES

Members of mechanical engineering graduate student committees (e.g. 2nd readers, thesis committee, dissertation committee, etc.) must be a tenure-track faculty member in the University of South Carolina system, on a term appointment as a Graduate School faculty, or approved by the department Graduate Studies Committee and the Graduate School on a case-by-case basis.

E. THE APOGEE PROGRAM

The Department of Mechanical Engineering offers a graduate distance-learning program called APOGEE (A Program of Graduate Engineering Education) to help engineering professionals earn graduate credit/degrees while maintaining full-time employment and without the constraints of on-campus attendance. A student enrolled in the APOGEE program can register for the degrees of Master of Engineering, Master of Science, or PhD. Prerequisites for enrollment and graduation are identical to those required for students registered on-campus in graduate programs of the Department of Mechanical Engineering.

APOGEE is a quality distance educational program designed to meet the needs of busy full-time employed professionals by providing flexibility in course content delivery. APOGEE courses are available via video-streaming and can be downloaded from the web for off-line viewing. This enables the student to access individual classes and course materials at any time and place according to the student's convenience. Thus the student will be able to participate in the enrolled course of study while still maintaining a busy work schedule, including any travel and/or reassignment. The APOGEE program option is available only to those who physically reside in the USA. More information can be found at http://sc.edu/study/colleges_schools/engineering_and_computing/study/graduate_education/distance/index.php

F. FINANCIAL AID

Three types of financial aid are available to qualified graduate students:

1. Teaching Assistantships (TAs)
2. Research Assistantships (RAs)
3. Fellowships and Scholarships

Students receiving a Teaching or Research Assistantship must be registered for 6 or more semester hours of credit during regular semesters and 1 semester hour in a summer session. Loss of the assistantship may occur at any time due to poor academic or work performance.

Teaching Assistantships

Teaching Assistantships of 1/4 time (6 hrs/wk) or 1/2 time (12 hrs/wk), are available for qualified graduate students. Generally, 4 to 6 new assistantships are available each year and they are awarded competitively on the basis of academic potential and performance, not on the basis of need. Grades, GRE and TOEFL or IELTS scores, recommendations, and teaching experience are used in the evaluation process. All TAs must pass a TA training/evaluation required by the State of South Carolina and administered by the Graduate School.

Research Assistantships

Research Assistants are generally supported by external grants and contracts. Individual faculty members who have sponsored research projects select the recipients of these assistantships. Students should contact faculty members in their area of interest to ascertain if support is available.

G. SEMINAR REQUIREMENTS

All DME graduate students who are on assistantship are required to participate in the DME Seminar series. Participation will be defined as attending a minimum of 80% of the seminars. Any student who does not attend 80% of the seminars will not be allowed to continue to receive research and/or teaching assistantships from DME in future semesters. Any student whose attendance falls below 50% during a semester will be subject, at the discretion of the DME Graduate Studies Committee, to immediate termination of his/her assistantship. Students involved in off-campus research, e.g. at a national lab, government facility, or a collaborating university, will be exempt

from this requirement during their absence from USC. Other reasons for missing the seminar will be considered on a case-by-case basis.

Any student whose assistantship is terminated or not renewed based on attendance to seminars may appeal to the DME Graduate Studies Committee. The appeal must include a letter of support by the student's advisor as well as a letter of explanation for lack of attendance. The DME Graduate Studies Committee will make a recommendation to the full faculty who will vote yes or no to the question of whether the student's eligibility for assistantship is to be renewed.

PART II. DEGREE PROGRAMS

Graduate programs offered by the USC Department of Mechanical Engineering lead to eight possible graduate degrees: M.S. in Mechanical Engineering, Nuclear Engineering and Aerospace Engineering; M.E. in Mechanical Engineering, Nuclear Engineering and Aerospace Engineering; and Ph.D. in Mechanical Engineering and Nuclear Engineering.

Graduate students must meet all the requirements of the USC Graduate School and of the Department of Mechanical Engineering. When a conflict exists, the University rules supersede those of the Department. Deviations from the stated requirements must be requested in writing and approved by the DME Graduate Faculty.

A. MASTER'S DEGREE PROGRAMS

Six Master's degree programs are offered by USC Department of Mechanical Engineering: M.S. and M.E. in Mechanical Engineering, M.S. and M.E. in Nuclear Engineering, and M.S. and M.E. in Aerospace Engineering.

Maximum Time Allowed

Students should plan their activities so as to complete the M.S. or M.E. programs of study within four semesters of full-time study (not counting summers). The maximum period allowed for Master's degree work is six years. In the event that more time is spent on the program, the student must petition for special arrangements with DME and the Graduate School.

Transfer Credit

Transfer credits from a previous graduate degree program must be approved by both DME and the Graduate School. The credits must be dated within the six-year period allowed for a Master's degree. A maximum of 12 credits can be transferred from another school with a grade of B or better.

Programs of Study

All students must consult with their academic advisor and complete a Program of Study form http://gradschool.sc.edu/forms/Mastersprogramofstudy.pdf during the first semester of enrollment. Changes to existing programs of study are performed using the Request For Adjustment in Graduate Program form http://gradschool.sc.edu/forms/POSAform.pdf.

It is the goal of the Department of Mechanical Engineering to have students, with the advice of their academic advisor, create a program of study that fits their interests while ensuring that they are well educated in the traditional areas of mechanical engineering, nuclear engineering or aerospace engineering.

All Master's degrees require a minimum of 30 credit hours at the 500-level or above. An M.E. degree will be granted upon successful completion of the course work as described below. An M.S. degree requires the successful completion of the course work described below as well as a thesis. Students must complete at least half of non-thesis credit requirements in courses numbered 700 or above.

Students earning an M.S. must have at least 6 hours of EMCH-799 Thesis Preparation and only 6 hours of EMCH-799 Thesis Preparation may be applied to the required 30 hours.

Program of Study for Master of Science (M.S.) in Mechanical Engineering

All M.S. candidates are required to take core courses as listed:

1. EMCH 508 (Finite Element)
2. EMCH 584 (Advanced Mechanics of Materials) or EMCH 532 (Intermediate dynamics)
3. EMCH 794 (Thermodynamics) OR EMCH 751 (Advanced heat transfer)
4. ENCP 707 (Continuum Mechanics)

All remaining work must be taken from an approved list of courses which currently includes all engineering courses numbered 500 or above and math courses numbered 700 or above. Business courses numbered 500 or above may be taken with advance approval by the advisor and the Graduate Studies Committee. Other courses will be added to the list as approved by the faculty.

Program of Study for Master of Engineering (ME) in Mechanical Engineering

All M.E. candidates are required to take core courses as listed:

1. EMCH 508 (Finite Element)
2. EMCH 584 (Advanced Mechanics of Materials) or EMCH 532 (intermediate dynamics)
3. Any two of EMCH 794 (Thermodynamics), EMCH 751 (Advanced heat transfer) and ENCP 707 (continuum mechanics)

Program of Study for M.S. and M.E. in Nuclear Engineering

For both the M.S. and M.E. degrees, the following list of courses will constitute a required core:

EMCH 552: Introduction to Nuclear Engineering
EMCH 553: Nuclear Fuel Cycles
EMCH 757: Radiation Shielding (or EMCH 557 Intro to Radiation Shielding and Sources)
EMCH 758: Reactor Systems (or EMCH 558 Introduction to Reactor Systems)

Elective Courses (to total 24 hours for MS or 30 hours for ME): At least 3 for MS or at least 5 for ME; approval by your advisor is required and documented in your program of study.

EMCH 555: Radiation Detection and Instrumentation
EMCH 561: Introduction to Nuclear Safeguards
EMCH 561: Nuclear Fuel Materials and Behavior
EMCH 561D: Licensing and Regulation
EMCH 573: Introduction to Nuclear Materials
EMCH 754: Thermal Hydraulic Design of Nuclear Reactors
EMCH 755: Advanced Nuclear Engineering
EMCH 756: Safety Analysis of Energy Systems
EMCH 759: Waste Management

EMCH 761F: Nuclear Chemical Engineering
EMCH 770: Predictive Modeling: Combining Experiments with Computations
EMCH 772: Nuclear Materials
EMCH 774: Radiation Damage in Materials
EMCH 791: Chemical Thermodynamic Calculations and Modeling with Applications

Engineering Elective (to total 24 hours for MS or 30 hours for ME):
Up to 1 course upon approval by your advisor and documented in your program of study.

- Any NE elective (from above)
- A math course (should be advised as which would be most appropriate)
- Any Engineering course at 500 level or higher.
- GEOL 650: Microscopy & Microanalysis

Program of Study for M.S. and M.E. in Aerospace Engineering

For both the M.S. and M.E. degrees, five courses constitute the required core:

EMCH 508: Finite Element Analysis
EMCH 577: Aerospace Structures I
EMCH 585: Introduction to Composite Materials
EMCH 721: Aero elasticity
EMCH 744: Aerodynamics & Flight Mechanics

Elective Courses—all students in Aerospace Engineering must take a minimum of two courses from the following list (6 hours):

EMCH 516: Control Theory in Mechanical Engineering
EMCH 522: Design For Manufacturability & Assembly
EMCH 532: Intermediate Dynamics
EMCH 544: Compressible Flows
EMCH 571: Mechanical Behavior of Materials
ENGR 701: Methods of Engineering Analysis
ENGR 707: Continuum Mechanics
ECHE 721: Advanced Heat Flow Analysis
EMCH 741: Viscous and Turbulent Flows
EMCH 743: Aircraft and Rocket Propulsion
EMCH 751: Advanced Heat Transfer
EMCH 777: Aerospace Structures II
EMCH 785: Design of Composite Materials for Aerospace Structures
EMCH 794: Thermodynamics
EMCH 881: Fatigue of Materials

Additional Program of Study Requirements

At least half of all courses must be taken at the 700 level and above.

Courses not satisfying the requirements for a graduate degree are:

1. Any course with a grade of D+, D or F.
2. Any course taken on a non-letter grade basis (except thesis).

The student must maintain a **minimum grade point average of 3.0** in:

1. All courses taken as part of the official degree program.
2. All courses numbered 700 or above.
3. All courses taken for graduate credit, including those not included in the official degree program.

Publication Requirement for M.S. Students

An educational objective for M.S. students is that they have the ability to communicate their research results through oral presentations and written publications. Consistent with this objective, an M.S. student is required to submit, based on research performed while at USC, at least one conference paper (or abstract with presentation) or one journal paper prior to graduation.

Master's Thesis

A thesis is required of all students seeking the M.S. degree. The student's academic advisor must approve the subject of the thesis. The Graduate School will furnish general thesis regulations upon request. Any student who wishes to use University facilities or to confer with the faculty on thesis work must be officially enrolled for thesis credit. Information about preparing and submitting your thesis is found at http://gradschool.sc.edu/students/thesisdiss.asp

Thesis Committee

A student's M.S. Thesis Committee consists of the student's advisor and the second reader of the student's thesis.

Thesis Presentation and Defense

The thesis presentation is to be open to all members of the University community and guests. The presentation and defense are to be conducted during normal business hours and on a day on which faculty members are expected to be on campus; more specifically, the exam should be held on Columbia campus, preferably a conference room in 300 Main, Swearingen, or the Horizon complex. It should be scheduled to take place Monday through Friday starting at 8:00 a.m. to 4:00 p.m. Official University Holidays excluded based on University Calendar of Holidays. Exceptions to time and place must be requested through the Graduate Director one month prior with a given explanation petitioning an exception to the rule(s). The Graduate Director will present to the Graduate Committee and the committee will give a decision within 2 weeks after receiving the request.

At least 7 days prior to the thesis presentation and defense, the student must submit a copy of a complete thesis to the advisor, the second reader and the Graduate Director. At least 14 days prior to the presentation and defense, a notice consisting of presentation title, abstract, time, place, and the names of the advisor and second reader is to be delivered to the Graduate Director. The notice is to be approved by the Graduate Director, dated and placed in the student's file. Using the information supplied, the Graduate Studies Committee will publicize the thesis and defense.

Comprehensive Examination

A comprehensive examination covering the major field of study is required of all candidates for the M.S. degree, which is conducted immediately following the thesis defense. The student's thesis committee administers this exam.

For the M.E. degree, a student passes the comprehensive exam by demonstrating mastery of the required course work in the core classes. This mastery may be demonstrated by obtaining a 3.0 average in the core courses.

Graduation

Within 15 days after the beginning of the semester of graduation, the student should submit an Application for Degree Form http://registrar.sc.edu/pdf/DegreeAppUpdated.pdf to the Graduate School. Graduation information can be found at http://commencement.sc.edu/. If a student fails to meet the requirements for graduation, a new application must be submitted for the subsequent graduation term.

Timetable of Action for Master's Degree Students

A timetable of actions needed for the Master's degrees is presented below. Required forms should be submitted to the Graduate School unless otherwise noted. The student bears the complete responsibility to see that all deadlines are met and all forms have the required Departmental and College approvals and that the forms are submitted to the Graduate School by the stated deadlines.

Form or Action	**Deadline**
Program of Study Form	End of first semester enrolled as graduate student Prior to graduation
Publication Requirement for MS Students	Prior to Graduation
Comprehensive Exam for M.E. students	Prior to graduation
Application for Degree Form	Within the first 15 days after the beginning of the last semester before graduation
Submit Thesis Presentation Notice to Graduate Director for Approval	14 days prior to thesis presentation and defense
Submission of Thesis to Thesis Committee and Graduate Director	At least 7 days before thesis presentation and defense
Filing of Thesis Form with required copies of Approved Thesis	20 days before the end of the last semester

B. DOCTOR OF PHILOSOPHY DEGREE PROGRAM

Residency

Residence at an approved university is required for at least three academic years, or their equivalent, after the candidate has begun graduate work. At least one year of the three must be spent on the Columbia campus of the University of South Carolina and all must be within eight years of the date at which the degree is to be granted.

The year of residence on the Columbia campus after admission to a doctoral program can be fulfilled by successful completion of two consecutive semesters of 9 or more graduate credits per semester, or three consecutive semesters of 6 or more graduate credits per semester. Enrollment in a summer term (both sessions) may be counted as equivalent to a semester, but enrollment in summer is not required to maintain continuity. Of the 18 hours, only 12 may be Dissertation Preparation (899).

The intent of the residency requirement is to ensure that doctoral students benefit from and contribute to the complete spectrum of educational and professional opportunities provided on the campus of a comprehensive university. When establishing residency, the student should interact with faculty and peers by regularly attending courses, conferences, and seminars, and utilize the library and laboratory facilities provided for graduate education.

Maximum Time Allowed

All work to be applied toward the Ph.D. must be completed within eight years prior to graduation.

Transfer Credit

If the student holds a qualified Master's Degree in Engineering, the Master's degree transfers in as 30 hours of graduate credit applied to the 60 hour post- baccalaureate Ph.D. program. If the student exercises this option, no additional hours can be transferred into the remaining 30 hour of post-Masters Ph.D. program. If the student does not have a qualified Master's Degree in Engineering, but has taken courses from a qualified graduate engineering program, the student is eligible to transfer in a maximum of 12 semester credits that can be applied towards the 60 hour post-baccalaureate Ph.D. program. Transfer credits from a previous graduate degree program must be approved by both the Department of Mechanical Engineering and the Graduate School. The credits must be dated within eight years. Based on recommendations of the student's Advisory Committee, a maximum of 12 semester credits with a grade of B or better may be transferred. The course work must be relevant to the current degree and have course content and level of instruction equivalent to that offered by the University's own graduate degree programs.

Advisory Committee

During the first semester after enrollment in the Ph.D. degree program and prior to the Ph.D. Qualifying Exam, the student, in consultation with the student's advisor, must submit the names of the Advisory Committee. The Advisory Committee consists of a minimum of four faculty members, one of which must be from outside DME. The student's academic advisor is typically the chairman of the committee. This committee guides the student's dissertation work and advises on the Program

of Study. Typically, the student will ask those faculty members closely associated with the research topic to be members of this committee. Faculty members have the right to decline any invitation to serve on a particular committee. The Advisory Committee must be approved by the Chair of the Department of Mechanical Engineering and by the Dean of the Graduate School.

Committees for Comprehensive Exam, Dissertation, and Dissertation Examination

A student's Advisory Committee also serves as the students' Comprehensive Exam Committee, Dissertation Committee, and Dissertation Examination Committee.

Program of Study

The Ph.D. degree requires a minimum of 60 graduate semester hours (including only 12 hours of dissertation preparation) beyond the Bachelor's degree. A student with a master's degree in mechanical engineering or a closely related field must take at least 18 hours of graded graduate courses (half of which must be 700-level or above), and a student without a master's degree must earn 48 graduate semester hours (42 or more hours must be graded graduate courses, half of which must be at 700 or above). Students not holding a Master's degree at the time of entry into the PhD program are subject to the same core course requirements as Master of Science candidates (see page 6 of this handbook).

Students entering the Ph.D. program holding a Master's degree in a subject other than mechanical engineering will be required to take as part of their 18 hours of required, graded, course work, the core courses required of all Master of Science students or they must show equivalence in previous, graduate, course work.

Prior to taking the Ph.D. qualifying exam, the student, in cooperation with the student's Academic Advisor, must complete the Ph.D. Program of Study Form. This form lists courses to be taken, courses to be transferred to USC, and courses already taken at USC.

Publication Requirement

An educational objective for Ph.D. students is that they have the ability to communicate their research results through oral presentations and written publications. Consistent with this objective, a Ph.D. student is required to submit, based on research performed while at USC, at least one peer-reviewed journal paper prior to graduation.

Ph.D. Qualifying Exam

The qualifying exam must be passed before a Ph.D. student can be admitted to candidacy. The exam, consisting of both written and oral components, is created and conducted by the student's advisory committee. The advisory committee, based on the exam results, determines if the student is qualified to pursue the Ph.D. degree program.

The designated date of the written and oral portions of the exam must be reported to the Graduate Director at least 14 days before the exam. The written and oral portions need not be on the same

nor on consecutive days. It is permissible for the advisory committee to devise a written exam which extends over several days.

The oral Ph.D. Qualifying Exam must be conducted during normal business hours and on a day on which faculty members are expected to be on campus; more specifically, the exam should be held on Columbia campus, preferably a conference room in 300 Main, Swearingen, or the Horizon complex. It should be scheduled to take place Monday through Friday starting at 8:00 a.m. to 4:00 p.m. Official University Holidays excluded based on University Calendar of Holidays. Exceptions to time and place must be requested through the Graduate Director one month prior with a given explanation petitioning an exception to the rule(s). The Graduate Director will present to the Graduate Committee and the committee will give a decision within 2 weeks after receiving the request.

A student, after being admitted to the Ph.D. degree program, will take the Ph.D. Qualifying exam in the first spring semester after completing three graded graduate courses at USC or at an earlier time specified by the student's exam committee.

If the exam committee determines that a student is not qualified to pursue the Ph.D. degree program, then the student cannot continue in the Ph.D. degree program but may apply for entrance into the M.S. or M.E. degree program in the Department of Mechanical Engineering. A student may re-apply for the Ph.D. degree program (a) after completing an M.S. or M.E. degree or (b) after not being enrolled as a USC mechanical engineering student for two years.

Admission to Candidacy

The Dean of The Graduate School admits a student to doctoral candidacy after the student has (1) passed the Ph.D. qualifying exam; (2) been fully admitted to the doctoral degree program; and (3) filed an approved doctoral program of study with The Graduate School. The Graduate School will notify the student and the graduate director of the admission to candidacy. Completion of all three components of the admission to candidacy procedure should be at least one full academic year before granting of the degree.

Comprehensive Exam

The Ph.D. Comprehensive Exam for the Department of Mechanical Engineering is to consist of both a written and oral parts. The examination is to be conducted by the student's Comprehensive Exam Committee. The examination is to focus on the student's proposed dissertation work. The student is to prepare a written dissertation proposal that will include background information, literature review, and proposed work. This written dissertation proposal will be considered the students written examination and will be delivered to the examination committee no less than 7 days prior to the oral portion of the exam. The oral portion of the examination will consist of a 30 to 45 minute presentation of the proposed work followed by questions from the attendees. The presentation is to be open to all members of the University community and guests. After questions are complete from the general audience all non-faculty guests will be asked to leave the room. The remaining faculty may ask question of the candidate on any subject related to the proposed work.

The Ph.D. Comprehensive Exam must be conducted during normal business hours and on a day on which faculty members are expected to be on campus; more specifically, the exam should be held on Columbia campus, preferably a conference room in 300 Main, Swearingen, or the Horizon complex. It should be scheduled to take place Monday through Friday starting at 8:00 a.m. to 4:00 p.m. Official University Holidays excluded based on University Calendar of Holidays. Exceptions to time and place must be requested through the Graduate Director one month prior with a given explanation petitioning an exception to the rule(s). The Graduate Director will present to the Graduate Committee and the committee will give a decision within 2 weeks after receiving the request.

At least 14 days prior to the oral portion of the examination, a notice consisting of a presentation title, abstract, time, place, name of student's advisor, and names of the student's Comprehensive Examination Committee members is to be delivered to the DME Graduate Director. The notice is to be approved by the Graduate Director and a copy of the notice placed in the student's file. Using the information supplied, the Graduate Studies Committee will publicize the oral portion of the examination.

Within 7 days after completion of the student's exam, the examination committee will inform the Graduate Studies Committee of the examination committee's assessment of the student's performance on the exam. The examination committee shall recommend one of the following options; 1) the student's proposal is satisfactory, 2) the student's proposal is unsatisfactory but only minor revisions are needed or 3) the student's proposal is unsatisfactory and major revisions are needed. In the case of option 2), the student must revise the proposal to the satisfaction of the examination committee. Once the revisions are completed to the satisfaction of the examination committee the student will have passed the exam. In the case of option 3), the student will have one year to retake the exam. The student must complete both the written and oral portions. If a student's performance is unsatisfactory and major revisions are needed again, then the student will be removed from the Ph.D. program.

Passage of the exam is required at least 12 calendar months prior to graduation. A student must attempt the examination within 24 months (36 months for APOGEE students) after enrolling in the Ph.D. degree program. The student must successfully pass the exam within 36 months (48 months for APOGEE). Any student who does not pass the examination within the specified time limit cannot continue in the Ph.D. program. A student may appeal to the Graduate Studies Committee for a 12-month extension. This appeal must include reasons for the student not completing the exam on time, the plan for the student to complete the exam within 12 months, and endorsement from the student's dissertation committee.

Any student removed from the Ph.D. program, either for failure to take the exam or failure of the exam, will be ineligible to reapply for the Ph.D. program unless the students has earned an M.S. degree after being removed or has not been enrolled at USC for 2 years after being removed.

Doctoral Dissertation

No later than five years after the Comprehensive Exam, the student must present a dissertation based on research that has been approved by the student's Dissertation Committee and the Dean of the Graduate School.

Three copies of the approved dissertation and abstract must be filed in the Graduate School office at least 20 days prior to the end of the semester that the student wishes to graduate. Information on the fees associated with dissertation submission is available in the Doctoral Dissertation Guidelines or from the Graduate School. During the preparation of the dissertation, any student who wishes to use University facilities or to confer with the faculty on dissertation work must be officially enrolled for dissertation credit. Registration for a minimum of 12 credits in Dissertation Preparation is required of all doctoral candidates.

Dissertation Presentation and Defense/Examination

The dissertation presentation is to be open to all members of the University community and guests. The Ph.D. Defense must be conducted during normal business hours and on a day on which faculty members are expected to be on campus; more specifically, the exam should be held on Columbia campus, preferably a conference room in 300 Main, Swearingen, or the Horizon complex. It should be scheduled to take place Monday through Friday starting at 8:00 a.m. to 4:00 p.m. Official University Holidays excluded based on University Calendar of Holidays. Exceptions to time and place must be requested through the Graduate Director one month prior with a given explanation petitioning an exception to the rule(s). The Graduate Director will present to the Graduate Committee and the committee will give a decision within 2 weeks after receiving the request.

At least 14 days prior to the presentation and defense, a notice consisting of presentation title, abstract, time, place, name of student's advisor, and names of the student's Dissertation Examination Committee members is to be delivered to the Graduate Director. The notice is to be approved by the Graduate Director and a copy of the notice placed in the student's file. Using the information supplied, the Graduate Studies Committee will publicize the dissertation and defense.

At least 7 days prior to the presentation and defense, the student must deliver a printed copy of the complete dissertation to members of the student's Dissertation Examination Committee and to the Graduate Director.

Immediately following the dissertation presentation, the student must orally defend the dissertation before their Dissertation Examination Committee and other members of the DME Graduate Faculty. This dissertation exam is primarily concerned with evaluation of the student's dissertation and understanding in the student's area of specialization. The exam will be interpreted as pass or fail. Students who fail the exam may be allowed to correct the dissertation and/or re-stand the oral examination, depending upon the decision of their Dissertation Examination Committee. A student who is not granted a re-examination or does not properly correct the dissertation may not receive a Ph.D. degree in the DME.

Graduation

Within 15 days after the beginning of the semester of graduation, the student should submit an Application for Degree Form http://registrar.sc.edu/pdf/DegreeAppUpdated.pdf to the Graduate School. Graduation information can be found at http://commencement.sc.edu/. If a student fails to

meet the requirements for graduation, a new application must be submitted for the subsequent graduation term.

Timetable of Action for Ph.D. Degree Students

A timetable of actions needed for the Ph.D. degree is presented below. Required forms should be submitted to the Graduate School unless otherwise noted. The student bears the complete responsibility for seeing that all deadlines are met, that all forms have the required Departmental and College approvals, and that the forms are submitted to the Graduate School by the stated deadlines.

Form or Action	Deadline
Advisory Committee formed	Within the 1st semester after enrollment in the program and before the Ph.D. Qualifying Exam
Program of Study Form	Prior to taking the Ph.D. Qualifying Exam and whenever changed
Ph.D. Qualifying Exam	Exam schedule to Graduate Director 14 days before the exam; Exam in the first spring semester after completing three graded graduate courses at USC or at an earlier time specified by the student's exam committee.
Comprehensive Examination	During the first 24 months (36 months for APOGEE students) after enrollment in the Ph.D. degree program and 12 months prior to graduation
Publication requirement	Prior to graduation
Submit notice for the oral portion of the Comprehensive Examination to the Graduate Director	14 days prior to the Oral Comprehensive Examination date
Submission of Dissertation Proposal to the Comprehensive Examination Committee and to the Graduate Director	At least 7 days prior to the oral portion of Comprehensive Examination
Application for Degree Form	15 days after the beginning of the last semester
Submit Dissertation Presentation Notice to Graduate Director	14 days prior to dissertation presentation
Submission of Dissertation to Dissertation Committee and to the Graduate Director	At least 7 days prior to dissertation presentation
Filing of Dissertation Form with required copies of the approved dissertation and abstract	20 days before the end of the last semester(See the Graduate Studies Bulletin and Doctoral Dissertation Guidelines for additional requirements)