MECHANICAL ENGINEERING GRADUATE PROGRAM HANDBOOK

UNIVERSITY OF SOUTH FLORIDA

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PREFACE

This booklet outlines the various departmental requirements and procedures that apply to all graduate students in the Mechanical Engineering Department and is subject to modification. **The contents of this booklet are supplementary to the rules and regulations of the Graduate School and the College of Engineering requirements and should be used only in that context.** Detailed information on Graduate School requirements and procedures can be found in the Graduate Catalog and in the Graduate School website (www.grad.usf.edu)

ENTRANCE REQUIREMENTS

MASTERS DEGREES: As a rule, only students with a B.S. in Mechanical Engineering or a closely related field from an accredited engineering program will be considered for admission. All applicants must take the General Test of the Graduate Record Examination (GRE). The student must have a grade point average (GPA) of 3.0/4.0 for the last two years of course work from an ABET accredited engineering program or a minimum percentile rank of 50% on the quantitative portion and a minimum average percentile rank of 50% in verbal and quantitative must be obtained for admission to the Master's Program. For admission to the accelerated Master's degree program (BSME-MSME or BSME-MME), students need to have a minimum cumulative GPA of 3.3 at the time of admission. Exceptions can be considered with respect to GPA or/and GRE with written recommendation by any current ME faculty member. International students must score a minimum of 550 on the Test of English as a Foreign Language (TOEFL) examination.

Ph.D DEGREE: As a rule, only students with a M.S. in Mechanical Engineering or a closely related field from an accredited engineering program will be admitted into the Ph.D. Program. Students without a M.S. or with an M.S. in another field may also be admitted but will be required to fulfill the course requirements for an MSME degree as outlined under in the following section. All applicants must take the General Test of the Graduate Record Examination (GRE). The student must have a grade point average (GPA) of 3.0/4.0 for the last two years of course work from an ABET accredited engineering program or a minimum percentile rank of 60% on the quantitative portion and a minimum average percentile rank of 60% in verbal and quantitative must be obtained for admission to the Ph.D. Program. Exceptions can be considered with respect to GPA or/and GRE with written recommendation by any current ME faculty member. International students must score a minimum of 550 on the Test of English as a Foreign Language (TOEFL) examination.

PROGRAM OF STUDY

MASTERS DEGREES: The department offers two Masters degrees: (1) Master of Science in Mechanical Engineering (MSME), which requires a thesis and (2) Master of Mechanical Engineering (MME), which does not require a thesis or project. All degrees require 30 credit hours of graduate work.

The MSME degree is awarded to students who have a B.S.M.E., have been accepted by the program and completed the necessary requirements as outlined below. The MME degree is awarded to students who have a B.S.M.E. degree, have been accepted to the program, and have completed the necessary requirements as outlined below.

All Masters Program students must complete a total of 12 core credit hours from two categories. Students should choose 6 credit hours of course work from the following category:

Fluid and Thermal Science

EML 6105: Advanced Thermodynamics and Statistical Mechanics
EML 6154: Advanced Conduction Analysis
EML 6713: Advanced Fluid Mechanics
EML 6930: Convection Heat Transfer

Students should choose 6 credit hours of course work from the following category:

Mechanics and Systems

EML 6223: Synthesis of Vibrating Systems
EML 6273: Advanced Dynamics of Machinery
EML 6653: Applied Elasticity
EML 6930: Failure Mechanisms in Materials
EML 6930: Advanced Materials

EML 6931: Advanced Mathematics or EML 6930: Advanced Mathematics II may be taken in lieu of one of the classes named above in order to satisfy a core requirement.

In addition to these 12 credit hours, the MSME degree requires a minimum of 12 credit hours of approved coursework and a minimum of 6 thesis hours for a total of 30 semester hours. Only students who select to earn the MSME degree will be eligible for University Fellowships or Departmental Graduate Assistantships.

In addition to the 12 core credit hours, the MME degree requires a minimum of 18 credit hours of approved coursework, for a total of 30 semester hours. Students who select the MME degree will not be eligible for University Fellowships or Departmental

Graduate Assistantships.

A minimum of 6 hours of additional coursework is to be chosen from the two categories shown above and/or from any EML class offered by the department. Independent Study and Special Topic classes are not considered regular classes and are not included in this group.

A maximum of six credit hours of Special Topics/Independent Study courses offered by the Mechanical Engineering Department and/or 6000-level non-EML coursework may be credited towards a degree. Undergraduate courses will not be eligible for graduate credit.

In order to graduate, MSME degree candidates must also successfully defend an original thesis.

A GPA of 3.0 or higher is required for graduation and no grade below a "C" can be applied towards the degree.

Students should be aware that only courses approved by their graduate advisor will count towards their degree. The student's faculty advisor and the Graduate Coordinator must approve the selection of courses**.**

Ph.D DEGREE: This degree requires a minimum of 72 credit hours beyond the baccalaureate degree, of which there must be a minimum of 36 hours of coursework at the 6000 level without counting Independent Study or Special Topics courses and a minimum of 20 hours of dissertation. A minimum of 18 hours of coursework is required in the student's area of concentration and there must be at least 6 hours of mathematics or statistics and 6 hours of coursework outside the major area of concentration. All students are required to fulfill the 12 credit hours of core course requirements as outlined under the Masters programs. Courses completed for a Master's degree from another institution may count towards a maximum of 24 credit hours of coursework for the Ph.D. degree only if the transcript shows that the degree requirements were similar to USF and the student did not already get credit for the identical courses at USF. A qualifying examination must be passed before admission to doctoral candidacy.

Qualifying Examination: The purpose of the Qualifying Examination is to determine if the student has acquired sufficient mastery of the subject matter in all relevant fields on his/her program of study to warrant admission to candidacy for the Ph. D. degree. It should be taken as soon as a student has completed a major portion of the coursework requirements. Students must apply to take the qualifying examination no later than the fourth semester after admission into the doctoral program.

In order to take the qualifying examination a doctoral student must satisfy the following requirements:

1. Satisfactorily complete (C or better) in departmental coursework on Mathematics and two other areas of specialization (1 major and 1 minor) as described below.
    a) Mathematics:
        a. Graduate courses - Advanced Mathematics, Advanced Mathematics II
    b) Heat Transfer:
        a. Undergraduate courses - Heat Transfer
        b. Graduate courses - Conduction Heat Transfer, Convection Heat Transfer
    c) Fluid Mechanics:
        a. Undergraduate courses – Fluid Systems
        b. Graduate courses - Advanced Fluids
    d) Thermodynamics:
        a. Undergraduate courses – Thermo I, Thermal Systems
        b. Graduate courses - Advanced Thermodynamics
    e) Dynamics:
        a. Undergraduate courses – Dynamics, Vibrations, Kinematics and Dynamics of Machinery
        b. Graduate courses - Advanced Dynamics of Machinery, Synthesis of Vibrating Systems
    f) Solid Mechanics:
        a. Undergraduate courses – Mechanics of Solids, Machine Design
        b. Graduate Courses - Applied Elasticity
    g) Materials:
        a. Undergraduate courses – Materials I
        b. Graduate courses - Advanced Materials

2. Apply in writing to the Graduate Coordinator for permission to take the examination. The application must include a detailed statement of the courses taken, major and minor areas of specialization and must be submitted before October 15th.

3. Students may request an exemption from any required coursework if they have satisfactorily completed (B or better) equivalent coursework at an accredited institution other than USF.

No student will be allowed to take the examination if the cumulative GPA of all courses taken at USF is below 3.0, have not chosen a major professor and formed a supervisory committee, or is holding conditional or provisional admission status in the program.

The examination will be administered by a Departmental Qualifying Examination Committee once a year (in the first two weeks of February), as needed.

1. Written Examination
   a. Examinations will be given on Mathematics, and student's chosen major and minor areas of specialization. Examinations will be prepared by the qualifying examination committee and will be administered by the graduate coordinator. Composition of the committee will be rotated among all faculty members and determined by the exam areas to be offered. If at all possible, a Ph.D. advisor will not be involved in the evaluation of her/his students. The length of each examination will be approximately three hours of duration.
   b. The type of written examination, i.e., open book etc., is at the discretion of the assessor.

2. Passing and Advancement to Candidacy
   a. A student is required to pass the written examination in all 3 areas (Mathematics, major area of specialization, minor area of specialization) for advancement to candidacy.
   b. In case a student passes in 2 areas and fails in 1 area, a make-up written or oral examination may be requested by the student. The make-up examination will be given during the last two weeks of March.
   c. In case a student fails the written examination in more than one area or fails the written or oral make-up examination, he or she will need to re-take the entire qualifying examination in the following year.
   d. Students will be given a maximum of two attempts to pass the qualifying examination. Failure in the second year will result in being dropped from the doctoral program.

MAJOR PROFESSOR AND SUPERVISORY COMMITTEE

The course of study for all graduate students must be approved by their major professor. Consequently, it is important for all graduate students to meet the faculty, determine their fields of interest, and select one faculty member as a major professor and others as supervisory committee members. The committee must be approved and appointed by the department chairman or his representative. For the masters degree a major professor and two committee members are required. For a Ph.D. degree a major professor and a minimum of four additional members are required, one of which must be from a different engineering department and one from another college. All students that chose their major professor outside of the department must have a ME faculty member as a co-major professor.

Formation of the supervisory committee must be completed during the first semester of study. Failure to comply with this requirement will result in the loss of financial aid.

UNDERGRADUATE COURSE PREREQUISITES FOR THE MASTERS DEGREE

Students entering the Masters Degree program must have completed the following courses in their undergraduate Mechanical Engineering curriculum:

a) Mathematics: Calculus I, II, III and Differential Equations.

b) Mechanical Engineering: Thermodynamics, Heat Transfer, Fluid Mechanics, Machine Design, and Solid Mechanics.

Students entering from disciplines other than Mechanical Engineering will be required to make up any deficiencies before starting their graduate work.

NON-DEGREE SEEKING STUDENTS

Students who are qualified to enroll in specific graduate courses, but who do not intend to work toward a graduate degree may enroll as non-degree seeking students. Non-degree students may enter classes on a space available basis during the first week of each semester by obtaining consent of the course instructor. Students must meet all stated pre-requisites of courses in which they wish to enroll. **NO MORE THAN TWELVE HOURS OF CREDIT EARNED AS A NON-DEGREE STUDENT MAY BE APPLIED TO SATISFY GRADUATE DEGREE REQUIREMENTS.** Any application of such credit must be approved by the degree granting college, students must earn a grade of B or better and the course must be suitable to the program. This track for entering graduate study has been found especially helpful to students in industry who seek special training in specified areas of graduate instruction, but are uncertain as to pursuing a degree. Students who miss the deadline for admission to the Graduate Program may also take courses as a non-degree seeking student while their admission to the Graduate Program is being evaluated.

COMPLETION OF THE PROGRAM

All degree seeking graduate students, excluding students admitted to candidacy, must be enrolled in at least one term (Fall, Spring, Summer) during the previous 12 months. Students who have not enrolled in any of the last three terms will be dropped from their degree program and changed to inactive. Students may reapply to the University by submitting a new application. Applicants will be subject to the admission criteria in

effect at that time. Students may request exceptions to this policy, for legitimate and valid reasons, through their Department, College, and the Graduate School.

MASTERS DEGREES

- Before graduating, the MSME students must prepare a thesis and present it to the Supervisory Committee prior to taking the final Comprehensive Oral Examination. **The student must present a typed final draft to the Supervisory Committee and Graduate Advisor one week before the final oral examination.**

- MME students must pass a final Comprehensive Oral Examination.

- All work applicable to the Masters degree requirements must be completed within five years from the time the student is first admitted into his/her program.

- Preparation for graduation: **It is the student's responsibility to apply for graduation through the Mechanical Engineering Department by the posted College of Engineering deadline**. Graduate students must be registered for a minimum of two hours the semester they graduate. If the student fails to complete requirements for the term in which application is made, then re-application for the degree must be made.

Ph.D DEGREE

- Students must be admitted to candidacy before they register for dissertation hours. See the USF Graduate catalog for requirements for admission to candidacy.

- The student must conduct an investigation resulting in an original and significant contribution to the knowledge in the chosen field of research. Students in the Ph.D. program must take a minimum of 20 hours of doctoral dissertation credits.

- Once admitted to candidacy students must enroll for a minimum of 2 credit hours each semester of the academic year until completion of the program.

FINANCIAL OPPORTUNITIES FOR GRADUATE STUDENTS

University Graduate Fellowships: Recipients are awarded $7,000 for two semesters, plus partial tuition waivers. Awards are based on academic record, GRE score, and letters of recommendation. In order to compete, applicants must have an undergraduate GPA of 3.2 or better, graduate GPA of 3.5 for any graduate work, and 1200 or better on the combined verbal-quantitative portions of the GRE. Applications are available in December from the individual Colleges.

Out-of-State Waivers: Funds for this program are allocated by the Graduate School and are available only to those graduate students who have been admitted to the program and who hold a Graduate Assistantship. These waivers are not automatic and a limited number of in-state and out-of-state tuition waivers are made available to the Department of Mechanical Engineering. These are assigned by the Chairman of Mechanical Engineering.

Minority Graduate Summer Program: This program is intended to provide qualified African American applicants the opportunity to acquaint themselves with graduate study. A stipend of $1,300 is provided and students may carry a minimum of 6 credit hours during the Summer semester. For additional information and applications, contact the Graduate School, (813)-974-2846.

Graduate Educational Opportunity Grants (GEOG): Outstanding African American graduate students receive a stipend of $6,300 for two semesters, plus tuition waivers. Nominations must be made to the Dean of the Graduate School by the chair or program director of the student's discipline. Nominees should be new, degree-seeking graduate students, have an undergraduate GPA of 3.0 or better, and a combined verbal-quantitative GRE score of 900 or better. For additional information, including deadlines, contact the Graduate School, (813) 974-2846.

Graduate Assistantships: Individual departments/programs award these assistantships and establish their own procedures for application. University policies, which govern graduate assistantships, include:

i) To be eligible to obtain a GRADUATE TEACHING ASSISTANTSHIP, a student must be degree-seeking and be registered for a minimum of nine credit hours each term toward degree requirements. International students must obtain a minimum score of 220 out of 300 on the SPEAK TEST.

ii) To be eligible to obtain a GRADUATE RESEARCH ASSISTANTSHIP, a student must be pursuing a MSME degree. MME students are not eligible to receive graduate assistantships from the department.

iii) Graduate students who receive financial support from the University other than fellowship recipients may hold their appointments for a maximum of two semesters while working toward the Master's degree and no more than four additional semesters while working toward the Ph.D.

iv) The Mechanical Engineering Department awards assistantships on a merit basis and only to those students whose technical and communication skills are acceptable. Applications are received at any time. Decisions on departmental assistantships are made in March and November. Students who accept a Graduate Assistantship in the Mechanical Engineering Department are not eligible to earn the MME degree.

Student Loans: Information is available through USF Financial Aid Office.

Information regarding scholarships, fellowships and external financial support is available from the Graduate Scholarships and Fellowships Program Office. Individual colleges have information pertaining to assistance in individual fields of study.

IMPORTANT CONTACTS FOR GRADUATE STUDENTS

GRADUATE ADMISSIONS
SVC 1036
(813) 974-8800

INTERNATIONAL SERVICES
CGS 104
(813) 974-5102

GRADUATE SCHOOL
ALN 226
(813) 974-2846

OFFICE OF FINANCIAL AID
SVC 1102
(813) 974-4700

USF TAMPA BOOKSTORE
BKS 0269
(813) 974-2631

ENGINEERING DEAN'S OFFICE
ENB 105
(813) 974-3780

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MECHANICAL ENGINEERING FACULTY AND AREAS OF SPECIALIZATION

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