

DOCTOR OF PHILOSOPHY (PHD) DEGREE PROGRAM Mechanical Engineering or Aerospace Engineering

The PhD is a research oriented degree requiring independent mastery of a field of knowledge. As such, considerable flexibility is allowed by the Graduate School in the tailoring of individual programs.

Successful completion of the MAE PhD degree program requires:

1. A minimum of 90 semester credits beyond the baccalaureate degree, including a minimum of 39 graded credit hours (excludes S/U graded courses) beyond the B.S. degree.
 - See Guidelines for Plan of Study for additional information.
2. A Qualifying Exam (Part I - written portion of the Candidacy Examination) at the end of the first academic year, i.e. in the Fall, Spring, or Summer term of the second year of program completion.
3. Submission of a Plan of Study upon successful completion of the Qualifying Exam.
 - The Plan of Study is determined by the Supervisory Committee Chairman, the Committee Membership, and the Graduate Student using the Guidelines for Plan of Study.
 - The Plan of Study records all courses (past/present/future) that will be used to satisfy program degree requirements.
 - Any deviation from the submitted and approved Plan of Study requires a revised plan submission.
 - Any deviation from the Guidelines for Plan of Study is approved on a case-by-case basis via petition. The petition should include a justification and/or rationale for course substitutions, course deletions, etc. Final approval is determined by the Faculty Graduate Coordinator and the Research Group Faculty, i.e. DSC, SMDM, or TSFD faculty members.
 - If a minor is chosen, consult the Graduate Catalog for the appropriate catalog year <http://gradcatalog.ufl.edu/>.
4. An Oral Proposal (Part 2 – oral exam of the Candidacy Examination) at the end of the second academic year, i.e. in the Fall, Spring, or Summer of the third year of program completion.
 - A time lapse minimum of two semesters is required between Candidacy and degree certification, i.e. graduation. The term in which the student is officially admitted to candidacy may be counted as one of the two semesters, provided the Oral Proposal (Part 2) is completed satisfactorily before the midpoint of the semester (students should consult the Graduate School calendar critical dates for each term).
 - MAE and Graduate School policy require a physical presence for the student and Supervisory Committee Chairman at the Oral Proposal. All other membership may have a remote presence (skype, phone, online, etc.). Separate meetings with individual Committee Members will invalidate Part 2 of the Candidacy Exam.

5. A Final Exam (submission of the dissertation written document and oral defense) presented to the Supervisory Committee Chairman and Committee Membership, which shows independent research to the satisfaction of the Graduate school and the Supervisory Committee.
 - MAE and Graduate School policy require a physical presence for the student and Supervisory Committee Chairman at the Final Exam. All other membership may have a remote presence (skype, phone, online, etc.). Separate defense meetings with individual Committee Members will invalidate the Final Exam.
 - The final dissertation defense and oral examination must be passed.
6. Degree certification within 5 years of the Oral Proposal or the written portion must be retaken.
7. Examination of the student's transcript for substantial agreement with the Plan of Study. Any deviations from the approved Plan of Study may be discussed by the Committee and either approved or rejected.
 - Students should note that the Supervisory Committee is under no obligation to allow a student to graduate whose coursework differs significantly from the approved Plan of Study.

Guidelines for Plan of Study

During the first year of graduate study, the normal expectation is that each student would take a 9 credits (3 courses or a combination of coursework and research) in both the Fall and Spring semesters and 6 credits of research in the Summer. Generally, these would include core courses and those which will prepare the student for the qualifying exam, as well as an appropriate mix of elective courses for the chosen specialization. Except for a minority of students doing interdisciplinary specializations whose plans of study will be reviewed by the Graduate Committee, a student will follow the requirements of one of the three MAE graduate study groups:

- Dynamics, Systems, and Control (DSC)
- Solid Mechanics, Design, and Manufacturing (SMDM)
- Thermal Science and Fluid Dynamics (TSFD)

The plan of study and qualifying exam will be based upon the chosen group from among the following three:

DYNAMICS, SYSTEMS, AND CONTROL (DSC)

DSC students must take a minimum of three of the following courses:

EML 5215 Analytical Dynamics (or EGM 5430)
EML 5311 Control System Theory
EML 5223 Structural Dynamics
EML 6281 Robot Geometry I

SOLID MECHANICS, DESIGN, AND MANUFACTURING (SMDM)

SMDM students must complete 3 of the 5 courses listed in Group A below and complete a minimum of 2 additional courses from Group B.

GROUP A:

EML 5526 Finite Element Analysis and Application
EGM 5533 Applied Elasticity and Advanced Mechanics of Solids
EML 6934 Failure of Materials in Mechanical Design
EML 6324 Fundamentals of Production Engineering
EGM 6611 Continuum Mechanics

GROUP B:

EML 5045 Computational Methods for Des. & Manuf.
EGM 5111L Experimental Stress Analysis
EGM 5584 Mechanics of Soft Tissues
EAS 6242 Advanced Structural Composites
EML 6267 Structural Dynamics of Production Machinery
EGM 6352 Advanced Finite Element Methods
EGM 6365 Structural Optimization
EML 6506 Fluid Film Lubrication
EML 6507 Wear of Materials
EGM 6570 Principles of Fracture Mechanics
EGM 6595 Bone Mechanics
EAS 6xxx Design and Optimization
EGM 6xxx Inelastic Materials
EML 6xxx Design of Precision Machines

THERMAL SCIENCE AND FLUID DYNAMICS (TSFD)

TSFD students must take a minimum of 4 of the following core courses:

EML 5104 Introduction to Classical and Statistical Thermodynamics
EML 6154 Conduction Heat Transfer
EML 6155 Convection Heat Transfer I
 Gas Dynamics
EGM 6812 Fluid Dynamics I
EGM 6813 Fluid Dynamics II

BASIC SKILLS COURSES

All MAE Ph.D. students must demonstrate their basic skills capability by successfully passing (with a B or better) an overall total of nine credits of basic skills courses with a minimum of three credits each in at least two of the following three areas:

A. Applied Mathematics

EGM 6321 Principles of Engineering Analysis I
EGM 6322 Principles of Engineering Analysis II
MAP 6327 Applied Differential Equations I
MAP 6505 Mathematical Methods of Physics and Engineering
MAP 6506 Mathematical Methods of Physics and Engineering II

B. Numerical Methods

EML 5526 Finite Element Analysis and Application
EGM 6341 Numerical Methods of Engineering Analysis I
EGM 6342 Numerical Methods of Engineering Analysis II
MAD 6406 Numerical Linear Algebra
MAD 6407 Numerical Analysis

C. Statistics and Data Analysis

EGM 5121C Data Measurement and Analysis
STA 5325 Mathematical Methods of Statistics
STA 6166 Statistical Methods in Research I
STA 6167 Statistical Methods in Research II
STA 6200 Fundamentals of Research Design
STA 6207 Basic Design and Analysis of Experiments

Other courses may be counted towards these Basic Skills requirements if a petition to that effect is approved by the student's Supervisory Committee and the Graduate Coordinator.

GRADUATE SEMINAR COURSE

EGM 6936, Graduate Seminar, 1 credit is required in the first three terms of the degree program. Students working exclusively at the REEF campus are exempted from this requirement.