PH.D. IN MECHANICAL ENGINEERING

http://www.umcoe.miami.edu/dept-mac/

Admission Requirements
The program leading to the degree of Doctor of Philosophy in the Department of Mechanical and Aerospace Engineering complies in full with the regulations of the Graduate School concerning admission, residence requirements, qualifying and final examinations and the dissertation.

Curriculum
1. All candidates for the Ph.D. degree are expected to complete an integrated program of studies in mechanical engineering, mathematics, physics and/or chemistry in preparation for the Qualifying Examination. For students entering with a Master’s degree, a maximum of only one course is allowed among 600-level or 700-level courses of the MAE Department that are designated as “Special Topics” or “Special Problems” that do not have scheduled lecture classes for the entire duration of the semester. For students entering with a Bachelor’s degree, a maximum of only two courses is allowed among 600-level or 700-level courses of the MAE Department that are designated as “Special Topics” or “Special Problems” that do not have scheduled lecture classes for the entire duration of the semester.
2. A qualifying examination, typically offered the last week of September, is to be taken by each doctoral degree student within the first three semesters of study. In the qualifying examination, the student is expected to demonstrate their competence in certain basic courses appropriate to modern mechanical engineering to the satisfaction of the department. A Ph.D. student will be admitted to candidacy after passing the qualifying examination as well as the defense of dissertation proposal.
3. There is no foreign language requirement.
4. One or two years beyond admittance to candidacy will usually be found necessary for the completion of an acceptable dissertation, whereupon the student will be required to pass the Final Oral Defense of the Dissertation.
5. The candidate may, if he/she so desires, pursue for their dissertation an investigation in connection with any of the research projects in progress in the Mechanical and Aerospace Engineering Department or, in the case of interdisciplinary programs, in other Colleges/Schools such as the School of Marine and Atmospheric Science or the Medical School.

Curriculum Requirements
For students who joined the program in Spring 2009 or after:

For students with a M.S. degree in Engineering:
• Minimum 18 credits of course work + 12 credits of dissertation.
• At least 6 credits must be at the 700 level.
• Expected duration of the program: 3 years.

For students with only a B.S. degree in Engineering:
• Minimum 36 credits of course work + 12 credits (or more) of dissertation.
• At least 12 credits must be at the 700 level.
• Expected duration of the program is 4 years.

For Ph.D. students with a non-engineering degree:
• Required credits and the expected duration of the program as specified in the assistantship offer letter.

In order to register for courses and/or dissertation in each semester, students are required to select the courses and/or dissertation credits by consulting their respective dissertation (research) advisors. They must also see the Graduate Advisor of the Department (Chair of the Department) for approval and signature.

Please note that the number of credits to be taken in various semesters is stated in each student's Ph.D. assistantship offer letter.

For Dissertation Credits
• Register as MAE 830 before passing both parts of the Qualifying Exam
• Register as MAE 840 after becoming a PhD candidate (usually after PhD proposal is passed)
• Register as MAE 850 Research in residence (after completing the required 12 credits of dissertation through MAE 830 and MAE 840).
Qualifying Exam

Ph.D. students are required to pass a 2-part Qualifying Exam.

Part 1 of the Qualifying Exam:
It consists of a written examination (no oral exam). Each student is required to select three areas, including Methods of Analysis, out of the following six areas:

- Methods of Analysis (Level of MAE 601) – compulsory for all students
- Mechanics of Solids (Undergraduate level)
- Fluid Mechanics (Undergraduate level)
- Heat Transfer (Undergraduate level)
- Materials (Undergraduate level)
- Control and dynamics (Undergraduate level)

A list of topics in each course will be given to the student at least one month before the Exam. All three areas will be covered in one exam of 6-hour duration (2 hours for each of the three areas) with a 30-minute break. It is expected that each student passes Part 1 of Qualifying Exam within the first year. If a student fails in one or more areas, a second chance may be given (within 3 months of the first exam).

Part 2 of the Qualifying Exam:
It consists of an oral exam before the student’s Dissertation Committee.

- The student presents a research proposal (in the form of a written report) to the Dissertation Committee after completing some preliminary research work including the Literature Review.
- Part 2 of the Qualifying Exam is to be taken within 2 years if the student has a Master’s degree in Engineering and 2.5 years if the student has only a B.S. degree in Engineering.

Mission
The mission of the graduate program is to prepare students to become knowledgeable and skilled engineers and researchers with an understanding of the ethical and other professional aspects of mechanical engineering.

Goals
Student Learning Outcomes

- Students will demonstrate competence in the theoretical and practical knowledge of mechanical engineering.
- Students will demonstrate the ability to communicate effectively the scientific and technical research in writing and oral presentations.
- Graduates will demonstrate the ability to conduct independent research and contribute to existing knowledge.