

DOCTOR OF PHILOSOPHY IN MECHANICAL ENGINEERING

Student Learning Outcomes

Students graduating from this program will:

- Demonstrate a thorough degree of knowledge in the discipline
- Demonstrate an ability to use proper investigation techniques for the discipline
- Use oral and written forms of communication to convey their ideas

Program Structure

Total Credits Required for Graduation: 42

Residence requirements: Ph.D. students must satisfy the doctoral residency requirement by satisfactory completion of at least 18 credits in no more than 24 consecutive months. When satisfying the residency requirement, all Ph.D. students are subject to the following restrictions:

- The doctoral residency requirement must be satisfied no later than the end of the semester in which the student completes his or her comprehensive examinations.
- Students must achieve a cumulative graduate grade-point average of at least 3.0 in all courses counted toward satisfying the residency requirement.

Mechanical Engineering Topics:

- Robotics and controls
- Thermal-Fluid sciences
- Renewable energy
- Biomechanics
- Materials
- Manufacturing
- Aerospace

Admission Requirements

A student who satisfies the general requirements for admission and meets the minimum requirements stated below will be considered for regular admission to the Mechanical Engineering Ph.D. program. A student who does not meet some of the requirements but shows high potential for advanced-level work may be considered for provisional admission. Admission also depends on factors such as number of seats available, resources available in the area of the student's interest, the quality of previous work, etc.

1. The applicant must have a bachelor's degree or a master's degree in civil or mechanical engineering or related disciplines with a grade-point average of at least 3.0 on a 4.0 scale in the last 60 hours of undergraduate engineering coursework. In addition, a GPA of 3.5 or better in all post-baccalaureate coursework is required. Pre-program requirements may be specified in case the bachelor's degree is in a discipline different than that to which the candidate is applying.
2. The GRE test is preferred but not required. It is beneficial to applicants to take the test and submit scores.
3. TOEFL or IELTS scores are required for international students without prior U.S. degrees. The minimum required score is 80 or 6.5 on TOEFL or IELTS, respectively. TOEFL requirements may be waived for applicants with a baccalaureate from an ABET accredited program.
4. The student must provide at least three recommendation letters from professors at previous institutions or mentors at work. The application can be initially reviewed with just one recommendation letter.
5. The applicant must provide a maximum 300-word statement on their goals and objectives in pursuing the Ph.D. The statement at the least should indicate which of the areas (civil or mechanical) the student is interested in and preferably indicate the sub-discipline the student is interested in as well, such as structures, construction management, biomechanical, HVAC etc.
6. Provisional admission may be granted if the minimum GPA and GRE requirements are not met, but other indicators promise the student's success in the program. To be fully admitted to the Interdisciplinary Ph.D. program, the provisionally admitted student must obtain a grade of B or better in the first nine hours of coursework and submit a satisfactory GRE score within their first year of the program.

Program Requirements

The PhD in Mechanical Engineering offers courses designed to provide students with advanced knowledge and skills in mechanical engineering topics. Students can select their required courses from those offered within the unit. Non-Mechanical Engineering courses can also be selected after discussion and approval by the student's Primary Advisor.

After completing coursework, students entering the program with an MS must complete at least 30 credit hours, inclusive of the 12 dissertation hours. The table below shows existing courses that will be offered under this program.

Code	Title	Credits
Mechanical Engineering Coursework:		30
MEC-ENGR 5506	Introduction to Biomaterials	
MEC-ENGR 5507	Advanced Dynamics and Modeling	
MEC-ENGR 5511	Introduction to Biomechanics	
MEC-ENGR 5512	Biodynamics	
MEC-ENGR 5513	Experimental Biomechanics of Human Motion	
MEC-ENGR 5516	Biomedical Device Design	
MEC-ENGR 5525	Failure Analysis	
MEC-ENGR 5526	Introduction to Manufacturing Management	
MEC-ENGR 5529	Additive Manufacturing	
MEC-ENGR 5533	Advanced Thermodynamics	
MEC-ENGR 5547	(Contracts and Law for Engineers - Reactivation Required)	
MEC-ENGR 5554	Power Generation Systems	
MEC-ENGR 5557	Mechatronics System Design	
MEC-ENGR 5558	Intermediate Dynamics	
MEC-ENGR 5559	Robotics and Unmanned Systems	
MEC-ENGR 5562	Applied Computational Fluid Dynamics	
MEC-ENGR 5564	Turbomachines	
MEC-ENGR 5570	Experimental Design & Analysis	
MEC-ENGR 5586	Applied Finite Element Analysis	
MEC-ENGR 5594	Robotic System Identification	
MEC-ENGR 5501	Advanced Topics In Mechanical Engineering (Unmanned Aircraft Combat Survivability)	
MEC-ENGR 5501	Advanced Topics In Mechanical Engineering (Flight and Road Test Engineering)	
MEC-ENGR 5501	Advanced Topics In Mechanical Engineering (Aircraft Design)	
MEC-ENGR 5501	Advanced Topics In Mechanical Engineering (Advanced Heat Transfer)	
MEC-ENGR 5501	Advanced Topics In Mechanical Engineering (Econ/Mgmt Sustainable Energy)	
MEC-ENGR 5501	Advanced Topics In Mechanical Engineering (Advanced Control Theory)	
MEC-ENGR 5501	Advanced Topics In Mechanical Engineering (Composite Materials)	
MEC-ENGR 5567	Fuel Cells and Renewable Energy Systems	
MEC-ENGR 5501	Advanced Topics In Mechanical Engineering (Vibration Analysis)	
MEC-ENGR 5501	Advanced Topics In Mechanical Engineering (Advanced Topics in Fluid Mechanics)	
MEC-ENGR 5501	Advanced Topics In Mechanical Engineering (Industrial Metrology)	
MEC-ENGR 5501	Advanced Topics In Mechanical Engineering (Imaging to Modeling)	
MEC-ENGR 5699	Research And Dissertation	12
Total Credits		42

Total Credit Hours: 42