PhD in Mechanical Engineering

The PhD degree is usually a four-year program which requires rigorous study and a high degree of emphasis on original research. PhD graduates take up positions in academic institutions, design, services and consulting companies.

Admission
Following are the minimum requirements for admission to the PhD in mechanical engineering program.

1. Applicants whose native language is not English must submit official, acceptable scores for either the TOEFL, the Academic Module of the IELTS examination, or the PTE-Academic test. Please visit the Graduate School website (http://wichita.edu/gradschool/) to check English proficiency requirements;
2. Submission of official GRE scores is required. GRE must be taken within two years of the application submission;
3. Cumulative GPA in graduate coursework. On a 4.000 scale, must have at least 3.250 in all graduate work;
4. Evidence of the ability to carry out an independent research problem and present it in written English is required;
5. Submission of two letters of recommendation and a statement of purpose indicating applicant’s research interests;
6. Prerequisites:
   a. Completion of the following or equivalent courses:
   b. Course | Title | Hours
   ME 662 | Senior Capstone Design | 3
   MATH 555 | Differential Equations I | 3
   A natural science course sequence equivalent to that in a typical ABET undergraduate engineering program.
   c. Programming competence in at least one of the following languages: C, C++, or MATLAB; and
   d. Possession of (or nearing the completion of) a master’s degree in mechanical or closely related engineering or physical sciences.

Direct PhD Admission of BS Graduates in Mechanical Engineering
The mechanical engineering department offers direct admission for truly exceptional students to its PhD program. Applicants must have consistent and exceptional credentials throughout all their academic career — including:

- A program GPA equivalent of 3.500/4.000 or higher in an undergraduate mechanical or closely related engineering program;
- A minimum combined GRE score of 310 or greater in Verbal and Quantitative skills and a minimum score of 3.5 in Analytical Writing skill are required; and
- Applicants are expected to demonstrate proven undergraduate research experience.

All other application requirements of the PhD program, such as a statement of purpose and two professional reference letters, and undergraduate prerequisites are required.

Program Requirements
1. Course Distribution: Total credit hours = minimum of 72 credit hours.

a. Graduate Coursework MS – PhD:
   i. Required Course (four semesters of ME Graduate Seminar).
   ii. Mathematics and computational tool courses (minimum 6 credit hours).
   iii. Minimum of 42 credit hours of technical electives:
      1. Up to 24 credit hours of coursework may transfer from previously earned master’s degree in mechanical engineering or closely related field as approved by the ME graduate coordinator.
      2. Maximum of 6 credit hours in coursework at the 600 level (beyond master’s level coursework).
      3. No coursework at the 500 level.
      4. Excess dissertation hours cannot be applied toward 42 credit hours of elective coursework.
   iv. Minimum of 12 credit hours of coursework (excluding dissertation hours) beyond the MS degree, should be at the 800 level or more. No coursework credit will be given to project, thesis/dissertation, and/or independent study.
   v. Maximum 24 credit hours of dissertation.

b. Graduate Coursework BS – PhD:
   i. Required Course (five semesters of ME Graduate Seminar).
   ii. Mathematics and computational tool courses (minimum 6 credit hours).
   iii. Minimum of 42 credit hours of technical electives:
      1. Up to 12 credit hours of graduate level coursework may transfer in ME or related disciplines as approved by the ME graduate coordinator.
      2. Maximum of 12 credit hours in coursework at the 600 level.
      3. No coursework at the 500 level.
      4. Excess dissertation hours cannot be applied toward 42 credit hours of elective coursework.
   iv. Minimum of 15 credit hours of coursework (excluding dissertation hours) must be at the 800 level or above. No coursework credit will be given to project, thesis/dissertation, and/or independent study.
   v. Maximum 24 credit hours of dissertation.

2. Course |
Title | Hours
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ME 730 | Modeling of Engineering Systems | 6
ME 749 | Applications of Finite Element Methods in Mechanical Engineering | |
ME 782 | Engineering Applications of Computational Fluid Dynamics and Heat Transfer | |
AE 722 | Finite Element Analysis of Structures I | |
IME 724 | Statistical Methods for Engineers | |
IME 754 | Reliability and Maintainability Engineering | |
IME 755 | Design of Experiments | |
IME 850 | Discrete Optimization | |
MATH 700+ | Three or more credit hours in mathematics courses at the 700 level or above | |
The requirement can be met by successfully completing and holding a public defense of the dissertation.

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<th>STAT 700+</th>
<th>Three or more credit hours in statistics courses at the 700 level or above</th>
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<td>ME 777 Mechanical Engineering Seminar (The ME department requires its PhD candidates to take this mandatory 0 credit hour seminar course at least four semesters—five semesters for direct BS to PhD degree—during their PhD program.)</td>
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Dissertation
| ME 976 PhD Dissertation (Select 24 credit hours in dissertation) | 24                                                                                     |

Technical Electives

Select as many related hours as necessary to satisfy the total credit hour requirements (at least 42 credit hours of graduate coursework)

Total Credit Hours 72

### 3. Advisor, Advisory Committee and Plan of Study:
Before completing 12 PhD credit hours at WSU, a student must select an advisor and an advisory committee. With the help of the advisor, the student must prepare a plan of study that needs to be approved by the advisory committee, graduate coordinator and Graduate School before the comprehensive exam is attempted.

### 4. Comprehensive Examination:
After completing a minimum of 18 PhD credit hours at WSU, a student must pass the comprehensive examination in at most two attempts, within two years from the start of the PhD program. Students who cannot pass the comprehensive exam in two attempts will be dismissed from the PhD program.

a. **Details of the comprehensive exam** - The exam is administered by the Graduate Coordinator once during fall and spring semester. The exam is set by the respective faculty members in thermal/fluids/energy; mechanical systems; control and robotics; or materials engineering. The open book exam lasts for four hours, and is administered by a proctor (no take-home component). The focus is on fundamental concepts and analytical skills in the area of the student's own research focus. This is graded by the concerned faculty members in their specialty. The passing grade is 70 percent. These policies may be subject to change.

### 5. Dissertation Approval Examination:
Prepare a dissertation research proposal and pass an oral examination of the proposal. A student cannot attempt the examination more than twice. A student must be continuously enrolled in ME 976 after the dissertation approval examination.

### 6. Dissertation Defense:
Must pass an oral examination of the dissertation.

### 7. Professional and Scholarly Integrity Training Requirement:
Must complete professional and scholarly integrity training requirement, preferably during the first semester of the program.

### 8. Other Program Requirements:
All other requirements are subject to college and university guidelines.

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**Applied Learning**

Students in the PhD in mechanical engineering program are required to complete an applied learning or research experience to graduate from this program.

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1 The mathematics and computational tool courses are not to be considered as the same language (tool) that the Graduate School employs and these do count towards the degree.