supplemental form. Applicants may select up to three areas from the following list:

- additive manufacturing
- aeroacoustics
- aerodynamics
- aeroelasticity
- aerospace materials
- aerospace structures
- aerospace systems design and simulation
- applied aerodynamics
- astrodynamics
- autonomous vehicles
- combustion and propulsion
- composite materials
- computational fluid mechanics
- computational mechanics
- controls, dynamical systems and estimation
- experimental fluid mechanics
- flow control
- fracture mechanics and fatigue
- GPS
- hypersonics
- information technology
- laser and optical diagnostics
- nanomechanics and micromechanics
- nanosatellites
- plasma physics
- robotics
- space environment and space mission design
- space systems
- structural mechanics/structural dynamics design
- unmanned aerial vehicles

For all applicants whose native language is not English, a minimum TOEFL or IELTS score is required. The TOEFL score requirements are as follows: minimum of 103 on the Internet-based test (iBT), 257 on the computer-based test (CBT), or 613 on the paper-based test (PBT). The TOEFL iBT with a sub-score of at least 24 in the spoken English section or the IELTS with a total score of at least 7.0 is required. IELTS is not accepted as a substitute for the TOEFL. All applicants must also take the Graduate Record Examination (GRE) because it is not possible to waive it. The Graduate Record Examination (GRE) general test is required for all applicants to the Aerospace Engineering graduate program.

**Graduate Teaching Experience**

M.S. students are not required to hold a teaching assistantship. Ph.D. students are required to hold a 25% teaching assistantship for at least one semester in order to meet the requirements for the Department of Aerospace Engineering doctoral program.

Information about teaching assistantships is located on the department's graduate programs Web site at [http://aerospace.illinois.edu/academics/graduate](http://aerospace.illinois.edu/academics/graduate).
assistantships can be found in the department's Web site (https://aerospace.illinois.edu/academics/graduate).

**Faculty Research Interests**

Research activities in the AE Department encompass a wide range of problem areas in aerospace engineering and related engineering disciplines cited in the Graduate Programs section above and more fully described at the department's research area Web site (https://aerospace.illinois.edu/research).

**Centers, Programs, and Institutes**

Several nationally renowned interdisciplinary centers exist within the College of Engineering in which Aerospace Engineering faculty members along with many other campus faculty engage in research. A list of these, along with links to full descriptions, appears at the department’s interdisciplinary centers Web site (https://aerospace.illinois.edu/research). Among these are the Beckman Institute for Advanced Science and Technology, the Center for the Simulation of Advanced Rockets (CSTAR), the Coordinated Science Laboratory (CSL), the Micro and Nanotechnology Laboratory, and the National Center for Supercomputing Applications (NCSA).

**Facilities and Resources**

Members of the Aerospace Engineering Department have access to a wide range of excellent research facilities. These laboratories support a wide range of activity and are described at the department's research Web site (https://aerospace.illinois.edu/research).

**Financial Aid**

Students in the M.S. non-thesis option are not provided funding by the department. Financial aid for graduate students in thesis graduate programs is available in the form of fellowships, teaching and research assistantships. A block grant from the National Aeronautics and Space Administration supports a multidisciplinary research and training program. Qualified candidates are considered for financial support upon application. In addition, graduate students making satisfactory progress toward their degrees may also be considered for financial support. All applicants, regardless of U.S. citizenship, whose native language is not English and who wish to be considered for teaching assistantships must demonstrate spoken English language proficiency (http://www.grad.illinois.edu/admissions/taengprof.htm) by achieving a minimum score of 24 on the speaking subsection of the TOEFL iBT or 8 on the speaking subsection of the IELTS. For students who are unable to take the iBT or IELTS, a minimum score of 4CP is required on the EPI test (http://cte.illinois.edu/testing/oral_eng/epi_overview.html), offered on campus. All new teaching assistants are required to participate in the Graduate Academy for College Teaching (http://cte.illinois.edu/programs/ta_train.html) conducted prior to the start of the semester.

The Aerospace Engineering Department offers two Masters programs:

- **Aerospace Engineering, M.S.** (http://catalog.illinois.edu/graduate/graduate-majors/aero-engin/ms-aero-engin)
- **Aerospace Engineering, M.S. - Online** (p. 3)

**Aerospace Engineering, PhD**

*For the degree of Doctor of Philosophy: Major in Aerospace Engineering*

### Entering with an approved M.S. Degree

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>AE 599</td>
<td>Thesis Research (min-max applied toward degree)</td>
<td>40</td>
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<tr>
<td>AE 590</td>
<td>Seminar (continuous registration through the 4th semester after the qualifying exam for 0 hours)</td>
<td>0</td>
</tr>
<tr>
<td>One advanced 500-level mathematics course from an approved list</td>
<td>3-4</td>
<td></td>
</tr>
<tr>
<td>Elective courses – chosen in consultation with advisor (subject to Other Requirements and Conditions below)</td>
<td>20-21</td>
<td></td>
</tr>
<tr>
<td>Total Hours</td>
<td></td>
<td>64</td>
</tr>
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</table>

### Other Requirements and Conditions

- **Minimum GPA:** 3.0
- A minimum of 8 hours of AE course credit overall at the 500-level, beyond the master's degree.
- A minimum of 16 credit hours overall at the 500 level, beyond the master’s degree, including the 8 hours of 500-level AE courses.
- A maximum of 4 hours of AE 597 (or other independent study) may be applied toward the elective coursework requirement.
- A 25% or more teaching assistantship for at least one semester.
- Qualifying exam: Yes
- Preliminary exam: Yes
- Final exam or dissertation defense: Yes
- Dissertation deposit: Yes

### Entering with an approved B.S. degree

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>AE 599</td>
<td>Thesis Research (min-max applied toward degree)</td>
<td>48</td>
</tr>
<tr>
<td>Coursework:</td>
<td></td>
<td>48</td>
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<tr>
<td>24 Hours of 500-level coursework, including 12 hours of 500-level AE coursework</td>
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<td></td>
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<tr>
<td>7-8 hours of Math (4 of the 7-8 taken must be at the 500-level and count toward the 24 hour requirement)</td>
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<tr>
<td>20-21 hours of 400/500 elective AE coursework per advisor approval</td>
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<td></td>
</tr>
<tr>
<td>AE 590</td>
<td>Seminar (continuous registration through the 4th semester after the qualifying exam for 0 hours)</td>
<td>0</td>
</tr>
<tr>
<td>Total Hours</td>
<td></td>
<td>96</td>
</tr>
</tbody>
</table>

*Information listed in this catalog is current as of 04/2019*
Other Requirements and Conditions  

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Minimum GPA:</td>
<td>3.0</td>
</tr>
<tr>
<td>A maximum of 4 hours of AE 597 (or other independent study) may be applied toward the elective course work requirement.</td>
<td></td>
</tr>
<tr>
<td>A 25% or more teaching assistantship for at least one semester.</td>
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</tr>
<tr>
<td>Qualifying exam 2</td>
<td>Yes</td>
</tr>
<tr>
<td>Preliminary exam</td>
<td>Yes</td>
</tr>
<tr>
<td>Final exam or dissertation defense</td>
<td></td>
</tr>
<tr>
<td>Dissertation deposit</td>
<td>Yes</td>
</tr>
</tbody>
</table>

1 For additional details and requirements refer to the department's Website (https://aerospace.illinois.edu) and the Graduate College Handbook (http://grad.illinois.edu/gradhandbook).

2 Qualifying Exam information

Aerospace Engineering, M.S.  
Online Program

The degree requirements are the same as for the on-campus non-thesis M.S. program (https://aerospace.illinois.edu/academics/graduate/ms-degree-program)—32 hours of course work—and the degree awarded to online students is the same degree awarded to resident students. Online students have five years to complete the program.

Students should develop a course program plan in consultation with their advisor. Suggested program tracts (https://aerospace.illinois.edu/academics/graduate/suggested-program-tracks) are provided for each of the three main technical divisions in the department:

1. Aerodynamics, Fluid Mechanics, Combustion and Propulsion (AFMCP);
2. Astrodynamics, Controls and Dynamical Systems (ACDS); and

The Aerospace Systems Engineering option (https://aerospace.illinois.edu/academics/graduate/ms-degree-program/ms-degree-non-thesis-campus/aerospace-system-engineering) is also available online.

Non-Thesis Option

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>AE 590</td>
<td>Seminar (registration for 0 hours every term while in residence)</td>
<td></td>
</tr>
</tbody>
</table>

Aerospace Engineering breadth requirement (https://aerospace.illinois.edu/academics/graduate/breadth-and-mathematics-requirements/breadth-and-mathematics-requirements) 9-12

One mathematics course from an approved list (https://aerospace.illinois.edu/academics/graduate/breadth-and-mathematics-requirements) 3-4

Elective courses chosen in consultation with an advisor (subject to Other Requirements and Conditions below) 16-20

Total Hours 32

Information listed in this catalog is current as of 04/2019