# Master of Science in Aerospace Engineering

## About This Program

The Master of Science in Aerospace Engineering is a research-oriented program in which completion of a thesis is mandatory.

The overall objective of the graduate program in Aerospace Engineering is to develop in a student the ability to define a technical problem, establish an appropriate mathematical or experimental model based on a firm understanding of the physical nature of the problem, analyze the problem by theoretical, numerical, or experimental techniques, and evaluate the results. Although this ability is developed in the context of aerospace problems, it is applicable to the engineering of any physical system. The program is designed for a student with any of the following specific objectives:

1. A sound foundation in advanced mathematics, science, and engineering which will equip the student well for research and development work or for further advanced study toward a doctoral degree in engineering.
2. A program of advanced study which allows specialization in one of the following areas:
   - Fluid dynamics, aerodynamics and propulsion (theoretical and applied aerodynamics, gas dynamics, viscous fluid mechanics, turbulence, computational and experimental fluid dynamics, bio-fluidics, hypersonic flow theory, high-temperature gas dynamics, V/STOL and rotorcraft aerodynamics, air-breathing and rocket propulsion);
   - Structural mechanics and structures (solid mechanics, aerospace structures, structural dynamics, composite structures and material characterization, damage tolerance and durability, smart structures, structure optimization, sensor technology, high-temperature structures and materials, aeroelasticity);
   - Flight mechanics and controls (atmospheric and space flight mechanics, orbital mechanics, guidance, navigation and control);
   - Vehicle design (conceptual aircraft design, atmospheric flight vehicle design, spacecraft design, computer-aided engineering).
3. A balanced but non-specialized program of advanced study in aerodynamics, astronautics, flight dynamics, structural analysis, propulsion, and fluid mechanics, with emphasis on experimental techniques and modern mathematical analysis.

## Competencies

1. Upon completion, students are expected to attain familiarity with mathematical concepts applicable to aerospace engineering.
2. Upon completion, students are expected to attain familiarity with theoretical concepts in Fluid Mechanics, Aerodynamics and Propulsion.
3. Upon completion, students are expected to attain familiarity with theoretical concepts in Solid Mechanics and Structures.
4. Upon completion, students are expected to attain familiarity with theoretical concepts in Flight Mechanics and Controls.
5. Upon completion, students are expected to attain familiarity with theoretical concepts in Flight Vehicle Design.

## Admissions Criteria

Applicants for the master’s degree must have a baccalaureate degree in engineering or science. Applicants who have completed a bachelor’s degree and wish to pursue a doctoral degree without completing a master’s degree may apply for admission in the PhD with BS Entry. The minimum admission requirements to this highly competitive track are the same as those for all doctoral applicants. All applicants must meet the general requirements of the Graduate School as stated in the section of this catalog entitled "Admission Requirements and Procedures". Applicants not meeting all criteria may be admitted on a provisional or probationary basis.

For applicants with no prior training in engineering or with insufficient undergraduate Aerospace Engineering coursework, the same minimum criteria will apply. Additionally, their records will be reviewed in relation to their mathematics, engineering, and science backgrounds, and probationary status may be a basis for acceptance of such applicants, with specific undergraduate remedial work required.

The UT Arlington Aerospace Engineering Program uses the following guidelines in the admission review process:

### UNCONDITIONAL ADMISSION

Unconditional admission into a Masters in Aerospace Engineering program requires the submission of items 1 through 4 below for each degree program. To be unconditionally admitted, an applicant must meet the minimum requirements for 1, 2 and 4.

1. An overall GPA, as calculated by the Graduate School, of 3.0 or higher in undergraduate coursework is required for admission to a masters program. (For some international applicants where GPA calculations based on a 4.0 system are not performed, a minimum performance level of 65 percentile. This minimum expectation may be higher for some countries, where less stringent grading criteria are used.) Performance in core Aerospace Engineering courses is of particular importance.
2. GRE scores of at least 146 (verbal) and 155 (quantitative). For those applicants whose GRE verbal score falls below 146, high TOEFL/IELTS scores may be considered to offset the GRE verbal score.
3. A Statement of Purpose detailing the applicant’s background, education, professional goals, technical interests, and research interests.

4. For applicants whose native language is not English: All students admitted in the program must meet the minimum university English language requirements as detailed in the general admission requirements section of the catalog. However, meeting the minimum requirement does not guarantee admission. The program will give preference to students with IELTS score of 6.5, or TOEFL-iBT total score of 84.

## PROBATIONARY ADMISSION

Probationary admission into a Masters in Aerospace Engineering program may be permitted under the following conditions for each degree program:

1. If the applicant meets any two of the items 1, 2, and 3 above for the master's program.
2. For applicants whose native language is not English: All students admitted in the program must meet the minimum university English language requirements as detailed in the general admission requirements section of the catalog. However, meeting the minimum requirement does not guarantee admission. The program will give preference to students with IELTS score of 6.5, or TOEFL-iBT total score of 84.

## PROVISIONAL ADMISSION

An applicant who is unable to supply all required documentation prior to the admission deadline, but who otherwise appears to meet admission requirements, may be granted provisional admission.

## DEFERRED ADMISSION

If an applicant does not present adequate evidence of meeting admission requirements, the admission decision may be deferred until admission records are complete or the requirements are met.

## DENIAL OF ADMISSION

Admission may be denied if the applicant has less than satisfactory performance in two out of the first three admission criteria.

## WAIVER OF THE GRADUATE RECORD EXAM

A waiver of the Graduate Record Examination may be considered for applicants with a GPA of 3.2 or higher from U.S. universities with an ABET accredited engineering program or other select U.S. universities subject to graduate advisor's approval. The waiver of the GRE applies only to applicants for the MENGR program. Interested applicants should contact the Aerospace Engineering Graduate Advisor. GRE is not waived for MS-Thesis and PhD programs.

# Curriculum

| | | |
|---|---|---|
| **Core Courses** | | |
| Select 2 courses, one from each of two different core areas. | | 6 |
| Fluid Mechanics, Aerodynamics and Propulsion | | |
| AE 5342 | GAS DYNAMICS | |
| AE 5350 | CLASSICAL AERODYNAMICS | |
| AE 5381 | BOUNDARY LAYERS | |
| Solid Mechanics and Structures | | |
| AE 5310 | FINITE ELEMENT METHODS | |
| AE 5311 | STRUCTURAL DYNAMICS | |
| AE 5312 | CONTINUUM MECHANICS | |
| AE 5339 | INTERMEDIATE MECHANICS OF MATERIALS | |
| Flight Mechanics and Controls | | |
| AE 5302 | ADVANCED FLIGHT MECHANICS | |
| AE 5362 | GUIDANCE, NAVIGATION, AND CONTROL OF AEROSPACE VEHICLES | |
| Flight Vehicle Design | | |
| AE 5368 | FLIGHT VEHICLE SYNTHESIS AND SYSTEMS ENGINEERING | |
| Select 2 math or engineering analysis courses. | | 6 |
| **Electives** | | |
| Select 4 courses in consultation with supervising professor, at least 3 of which must be in aerospace engineering and may not include speical project or research courses. Courses outside aerospace engineering require prior approval of the supervising professor or graduate advisor. | | 12 |
| **Thesis** | | |
| Select at least 6 hours from the following: [1] | | 6 |
| AE 5197 | RESEARCH IN AEROSPACE ENGINEERING | |
| AE 5297 | RESEARCH IN AEROSPACE ENGINEERING | |
| AE 5397 | RESEARCH IN AEROSPACE ENGINEERING | |

| | | |
|---|---|---|
| AE 5398 | THESIS | |
| AE 5698 | THESIS | |
| **Total Hours** | | **30** |

[1] The student might enroll in any thesis or research course every semester in which the student is actively involved in thesis preparation or research, respectively, except that the student must enroll in AE 5398 or AE 5698 in the semester of graduation.

## Program Completion

All candidates are required to select a supervising professor and obtain an approved program of work in the second full semester or after 12 hours are completed.

Only courses completed with a grade of A, B, C, or P can satisfy graduate degree or certificate requirements. However, courses in which grades of D or F are earned will affect a student's grade-point average. A student must have a B (3.000) grade-point average in courses included in their degree plan and a B (3.000) average in all work undertaken as a graduate student to have credits applied toward a graduate degree or certificate.

## Advising Resources

Advising can be conducted in person or remotely via Teams. Please email your advisor to schedule an appointment.  The advising form can be downloaded from the MAE Grad Advising Canvas page. First consult with your advisor if you are planning a Leave of Absence, Grade Forgiveness, or Change of Program.

### Location:

306 Woolf Hall

### Email:

MAEGradAdvising@uta.edu

### Phone:

817-272-2500

### Web:

Graduate Advising Webpage (https://www.uta.edu/academics/schools-colleges/engineering/academics/departments/mechanical-aerospace/students/gradadvising/)