**For non-Japanese**

# Academic Year 2025
# Graduate School of Engineering, The University of Tokyo
# Department of Aeronautics and Astronautics

## Guide to Entrance Examination

## Master's Program
## Doctoral Program

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# Academic Year 2025
# Graduate School of Engineering, the University of Tokyo
# Department of Aeronautics and Astronautics
# Master's program entrance examination guide

**"Educational Policy of Department of Aeronautics and Astronautics/Purpose of research"**

**(1) Aeronautics and Astronautics, which has great potential for development as an industry, is a valuable source of undeveloped technology:**
Aerospace is still an immature field in terms of technology and its utilization; therefore, it holds great promise for future development. The Department of Aeronautics and Astronautics pursuits the discipline's significance and possibilities that are outward as well as underlying. The program conducts research and provides education that can be utilized for the welfare and happiness of mankind.

**(2) Advanced technology in the field of Aeronautics and Astronautics will be spun off to other fields:**
By conducting research and providing education in the aerospace field, which requires an extremely high level of performance and leading-edge technology, we aim to create advanced technology, discover knowledge, and promote new developments in engineering that are applicable to many other fields.

**(3) Aeronautics and Astronautics represent system integration technology:**
In the world of aerospace, engineering, and science, which relate to many fields, are integrated. Technology that combines ideas is required, in particular to construct a system that aims to achieve one purpose. By taking advantage of the nature of this discipline, this program strives to conduct system integration and practical research while providing education focusing on space missions.

1. This guide aims to supplement the application guidelines for the master's program students in the Graduate School of Engineering, the University of Tokyo, for academic year 2024. In addition, examinees should carefully read the "examinees' instructions" provided at the end of this entrance examination guide

2. As described in the application guidelines, we plan to accept 37 students into the Department of Aeronautics and Astronautics in 2025.
   The examination for this major includes the official TOEFL® (TOEFL iBT, TOEFL iBT Home Edition) score, a written test (general education subject [mathematics], and specialized subjects) and an oral test. As a general rule, students are required to take the exam in all subjects, including the oral test

   Note In order to take the entrance examination for the Department of Aeronautics andAstronautics, it is necessary to submit the official TOEFL® (TOEFL iBT, TOEFL iBT Home Edition) score so that it will reach Graduate School of Engineering by August 14 (Wednesday). For details, refer to "Notice regarding Foreign Language (English) Examinations in 2025 Graduate School of Engineering, The University of Tokyo Entrance Examinations (How to submit TOEFL score)." Examinees who are unable to take the TOEFL tests in their countries should contact the following department's email address (koku@office-aero.t.u-tokyo.ac.jp)

3. An orientation on the graduate school entrance exam of Department of Aeronautics and Astronautics will be held online at 12:15 on April 19 (Friday). The details will be posted on the department's website.

4. The schedule of the examination is as follows. The test center will be posted on the School of Engineering website until 10:00 am on August 25 (Friday). (Please refer to the examinees' instructions). The test center for other subjects will also be posted at the entrance of the Department of Aeronautics and Astronautics (Engineering Building 7) at about the same time.

| Month and Day | Time | Subject | Remarks |
|---|---|---|---|
| August 26 (Monday) | 8:30-11:30 | Specialized subjects | Note 1) |
| | 13:00-15:30 | Mathematics | Note 2) |
| August 27(Tuesday) | Morning/ Afternoon | Oral examination | Note 3) |

Note 1) In the written tests for the specialized subjects, examinee may freely choose three out of four subjects including fluid mechanics (fluid mechanics and high-speed aerodynamics), solid mechanics (mechanics of materials and structures), aerospace system engineering (flight mechanics and control),and propulsion engineering (mechanical dynamics, thermodynamics, and electromagnetism).

Note 2) In the written test for the general education subject [mathematics], examinees shall answer three out of six questions.

Note 3) The oral examination is conducted on topics related to the fields that examinees plan to research on after enrolling in graduate school and the topics related to their thesis in the undergraduate program. The examination time will be posted during the test period.

5. Instructors in the Department of Aeronautics and Astronautics

The academic staffs teaching in the Department of Aeronautics and Astronautics consist of full-time academic staffs for this major (at Hongo campus) and academic staffs affiliated with the Department of Advanced Interdisciplinary Studies, the Graduate School of Frontier Sciences, Institute of Space and Astronautical Science in Japan Aerospace Exploration Agency. Currently (April 2024), there are 33 instructors in the Department of Aeronautics and Astronautics. Each academic staff's area of expertise is shown in the Appendix that follows. In the attached table, the staffs designated with an asterisk (*) are scheduled for retirement in March 2025, and the staffs designated with a double asterisk (**) are scheduled for retirement in March 2026.

Remarks

1) According to Article 11 of the University of Tokyo Graduate School Regulations, graduate students must work with instructors in the department of their respective majors as their primary advisors.
2) In the attached table, "Aero & Astro" in the column of affiliation refers to the full-time academic staffs for this major (at Hongo campus); AIS refers to the Department of Advanced Interdisciplinary Studies; "Frontier Sci." refers to the Graduate School of Frontier Sciences; RCAST refers to the Research Center for Advanced Science and Technology; JAXA/ISAS refers to Japan Aerospace Exploration Agency/Institute of Space and Astronautical Science.

6. The primary advisors will be determined by November 2024 after the department administers a survey on the successful candidates' preferences on the academic advisor in September 2024. Please be aware that international applicants who fall under any of the conditions set out in "The University of Tokyo Security Export Control Regulations" may not receive permission to be supervised by the candidates' preferred academic advisor. Non-Japanese examinees shall submit a questionnaire on the primary advisors.

7. The items required to be carried to the written examination are as follows:

   writing instruments, rulers, compasses, erasers, and a watch (watches with functions other than time measurement are not allowed)

# Academic Year 2025
# Graduate School of Engineering, the University of Tokyo
# Department of Aeronautics and Astronautics
# Doctoral program entrance examination guide

**"Educational Policy of Department of Aeronautics and Astronautics/Purpose of research"**

**(1) Aeronautics and Astronautics, which has great potential for development as an industry, is a valuable source of undeveloped technology:**
Aerospace is still an immature field in terms of technology and its utilization; therefore, it holds great promise for future development in the future. The Department of Aeronautics and Astronautics pursuits the discipline's significance and possibilities that are outward and underlying. The program conducts research and provides education that can be utilized for the welfare and happiness of mankind.

**(2) Advanced technology in the field of Aeronautics and Astronautics will be spun off to other fields:**
By conducting research and providing education in the aerospace field, which requires an extremely high level of performance and leading-edge technology, we aim to create advanced technology, discover knowledge, and promote new developments in engineering that can be applied to many other fields.

**(3) Aeronautics and Astronautics represent system integration technology:**
In the world of aerospace, engineering, and science, which relate to many fields, are integrated. Technology that combines ideas is required, in particular to construct a system that aims to achieve one purpose. By taking advantage of the nature of the discipline, this program strives to conduct system integration and practical research while providing education focusing on space missions.

1. This guide aims to supplement the application guidelines for the doctoral program students in the Graduate School of Engineering, the University of Tokyo, for academic year 2025. In addition, examinees should carefully read the "examinees' instructions" provided at the end of this entrance examination guide.

2. As described in the application guidelines, we plan to accept 18 students into the Department of Aeronautics and Astronautics in 2025. Selection is based on the first exam and the second exam.

3. The first examination for this major includes the official TOEFL® (TOEFL iBT, TOEFL iBT Home Edition) score, a written test (general education subjects [mathematics]), and an oral test. As a general rule, students are required to take the exam in all subjects, including the oral test.
   In addition, regarding the third point in the application guidelines, "application schedule B" will be not conducted.

   Note 1) In order to take the entrance examination for the Department of Aeronautics and Astronautics, it is necessary to submit the official TOEFL® (TOEFL iBT, TOEFL iBT Home Edition) score so that it will reach Graduate School of Engineering by August 14 (Wednesday). For details, refer to " Notice regarding Foreign Language (English) Examinations in 2025 Graduate School of Engineering, The University of Tokyo Entrance Examinations (How to submit TOEFL score)." Examinees who are unable to take the TOEFL tests in their countries should contact the following department's email address (koku@office-aero.t.u-tokyo.ac.jp)

4. An orientation on the graduate school entrance exam of Department of Aeronautics and

Astronautics will be held online at 12:15 on April 19 (Friday). The details will be posted on the department's website.

5. The schedule of the first examination is as follows. The test center will be posted on the School of Engineering website until 10:00 am on August 23 (Friday). (Please refer to the examinees' instructions)

| Month and Day | Time | Subject | Remarks |
|---|---|---|---|
| August 26 (Monday) | 13:00-15:30 | Mathematics | Note 1)<br>Note 2) |
| August 28 (Wednesday) | Afternoon | Oral examination | Note 3)<br>Note 4) |

Note 1) In the written test for the general education subject [mathematics], examinees shall answer three out of six questions.

Note 2) Students who have completed the master's program in the Graduate School of Engineering, the University of Tokyo, or in the Department of Advanced Energy, Graduate School of Frontier Sciences, the University of Tokyo, or who are expected to complete either of them, are exempted from submitting the official TOEFL® score and taking the written tests for general studies (mathematics) on the first examination.

Note 3) The specialized topics on the first exam will be divided into the following four groups. Only an oral examination will be conducted. The group assignments are determined according to each student's choice of academic advisor on their application forms.

A. Aerodynamics
B. Structure and Materials
C. Control and Flight Dynamics
D. Engines and Propulsion

Note 4) The oral examination for the science specialization on the first exam will be conducted on topics related to the examinees' fields of specialization. The examinees should prepare a summary (2–4 A4-sized pages) of their research area in the master's program and use it as supplementary information. Moreover, if an examinee who has already completed the master's program has conducted further research after completing the master's program, the examinee should bring his/her master's thesis, together with aforementioned summary which also includes the overview of his/her research conducted after the completion of the master's program. The test site, time, and number of copies of necessary materials will be posted in the lobby of Engineering Building 7 on August 26 (Monday). The examinees should refer to this information.

6. As a general rule, the second examination is scheduled to be held between late-January 2025 and mid-February 2025. It will be an oral examination concerning the areas of specialization. The examinees will be informed at a later date.

7. Instructors in the Department of Aeronautics and Astronautics

The academic staffs teaching in the Department of Aeronautics and Astronautics consist of

full-time academic staffs for this major (at Hongo campus) and academic staffs affiliated with the Department of Advanced Interdisciplinary Studies, the Graduate School of Frontier Sciences, and Institute of Space and Astronautical Science in Japan Aerospace Exploration Agency. Currently (April 2024), there are 33 instructors in the Department of Aeronautics and Astronautics. Each academic staff's area of expertise is shown in the Appendix that follows. In the attached table, the staffs designated with an asterisk (*) are scheduled for retirement in March 2025, and the staffs designated with a double asterisk (**) are scheduled for retirement in March 2026.

Remarks:

1) According to Article 11 of the University of Tokyo Graduate School Regulations, graduate students must select their primary advisors who belong to the department of students' majors.
2) In the attached table, "Aerospace" in the column of affiliation refers to the full-time academic staffs for this major (at Hongo Campus); AIS refers to the Department of Advanced Interdisciplinary Studies; "Frontier Sci." refers to the Graduate School of Frontier Sciences; RCAST refers to the Research Center for Advanced Science and Technology; JAXA/ISAS refers to Japan Aerospace Exploration Agency/Institute of Space and Astronautical Science.
3) Please be aware that international applicants who fall under any of the conditions set out in "The University of Tokyo Security Export Control Regulations" may not receive permission to be supervised by the candidates' preferred academic advisor. Non-Japanese examinees shall submit a questionnaire on the primary advisors.

8. No special measures related to COVID-19 will be taken. If there are any changes, the information will be posted on the department's website.

9. The items required to be carried to the written examination are as follows. :

writing instruments, rulers, compasses, erasers, and a watch (watches with functions other than time measurement are not allowed).

April, 2024

# List of Academic Staff

| Affiliation | Title | Name | Area of expertise |
|---|---|---|---|
| Aero & Astro | Professor | Kenichi RINOIE* | Aircraft Design,<br>Separated Flow Aerodynamics |
| Aero & Astro | Professor | Shin-ichi NAKASUKA** | Spacecraft Engineering,<br>Control, Orbital Mechanics |
| Aero & Astro | Professor | Mituhiro TSUE | Combustion, Propulsion System |
| Aero & Astro | Professor | Akira IWASAKI | Earth Observation,<br>Space Environment Utilization |
| Aero & Astro | Professor | Kimiya KOMURASAKI | Electric and Advanced Space Propulsion,<br>Electromagnetic Energy System |
| Aero & Astro | Professor | Katsuhiro NISHINARI | Nonlinear Dynamics |
| Aero & Astro | Professor | Susumu TERAMOTO | Aerodynamics of Internal Flow |
| Aero & Astro | Professor | Takeshi TSUCHIYA | Flight Mechanics, System Optimization |
| Aero & Astro | Professor | Takehiro HIMENO | Aerospace Propulsion |
| Aero & Astro | Professor | Taro IMAMURA | Aircraft Aerodynamic, Computational Fluid Dynamics, Computational Aeroacoustics |
| Aero & Astro | Professor | Tomohiro YOKOZEKI | Mechanics of Materials and Structures,<br>Composite Structures |
| Aero & Astro | Associate Professor | Shinji NAKAYA | Thermal Reactive Flows, Aerospace Propulsion, Combustion |
| Aero & Astro | Associate Professor | Ryu FUNASE | Guidance,<br>Navigation and Control of Spacecraft,<br>Deep Space Exploration System |
| Aero & Astro | Associate Professor | Shu MINAKUCHI | Advanced Composites, Smart Structures |
| Aero & Astro | Associate Professor | Daichi YANAGISAWA | Application of Fluid Dynamics and Cellular Automaton |
| Aero & Astro | Associate Professor | Rei YAMASHITA | High-speed Aerodynamics・Computational Fluid Dynamics・Sonic Boom |
| Aero & Astro | Associate Professor | Satoshi IKARI | Astrodynamics, Spacecraft Formation Flying, Spacecraft Systems Engineering |
| Aero & Astro | Lecturer | Masahito AKAMINE | Experimental Fluid Dynamics,<br>Aeroacoustics |
| Aero & Astro | Associate Professor | Samir Mohamed KHAN* | Prognostics and System Health,<br>Management |
| Aero & Astro | Associate | Ryo HIGUCHI | Mechanics of Composite Materials, |

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| | Professor | | Computational Mechanics |
| Frontier Sci. | Professor | Kojiro SUZUKI | Aerodynamics and Aero-thermodynamics of High Speed Flow |
| Frontier Sci. | Professor | Koji UENISHI | Mechanics of Materials, Impact Engineering |
| Frontier Sci. | Associate Professor | Hiroyuki KOIZUMI | Electric Propulsion |
| AIS | Professor | Takehisa YAIRI | Artificial Intelligence and Machine Learning for Space Systems |
| AIS | Lecturer | Naoya TAKEISHI | Machine Learning, Dynamical System |
| RCAST | Professor | Eri ITOH | Air Traffic Management, Air Transport System |
| ISAS/JAXA | Professor | Kenji MINESUGI | Space Vehicle Structures |
| ISAS/JAXA | Professor | Yuichi TSUDA | Spacecraft system, Orbital Dynamics, Astrodynamics |
| ISAS/JAXA | Professor | Hiroyuki OGAWA | Thermal-Fluids Engineering |
| ISAS/JAXA | Professor | Kazutaka NISHIYAMA | Electric Propulsion |
| ISAS/JAXA | Professor | Akira OYAMA | High Speed Fluid Dynamics, Design Engineering |
| ISAS/JAXA | Professor | Satoshi NONAKA | Aerodynamics of Launch Vehicle Space Transportation System |
| ISAS/JAXA | Professor | Hiroaki KOBAYASHI | Air-Breathing Engine, Hypersonic Propulsion |