Master Aerospace Engineering
Aerodynamics and Wind Energy (AWE)

MSc Programme

The MSc track in Aerodynamics and Wind Energy combines fundamental and applied research disciplines of aerospace and wind-power systems, focusing on the development of new analysis techniques and their application in design. It is aimed at those who wish to acquire experience with both experimental and numerical methods as well as design procedures and optimisation techniques.

Degree	Master of Science
Starts	September
Type	full-time
Credits	120 ECTS, 24 months
Language	English
Application deadline	
- Dutch degree	May 1st
- Non-Dutch degree	
• EU/EFTA	April 1st
• Non-EU/EFTA	January 15th
Scholarships	scholarships.tudelft.nl

Profiles

Students can graduate within one of two thematic profiles, which determines the courses followed in the first year of the MSc.

Aerodynamics Profile

The aerodynamics profile covers the fundamentals of mathematics, flow physics, and flow analysis methods. Its courses include Partial Differential Equations, Gasdynamics, Aircraft Aerodynamics, Computational Fluid Dynamics, Experimental Simulations and Flow Measurement Techniques.

After successful completion of the profile programme you will:

- Have an advanced knowledge of viscous and compressible flows, and of the influence of flow phenomena on external flow aerodynamics.
- Have an advance knowledge of the design the design of wind tunnel experiments, and have experience with modern measurement techniques including laser Doppler anemometry, infrared thermography, and particle image velocimetry.
- Have an advance knowledge of the modern modern computational methods for both incompressible and compressible flows, as well as advanced concepts in turbulence computation, mimetic methods, efficient time marching, uncertainty quantification and data assimilation.

TU Delft

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FIRST YEAR	SECOND YEAR
CORE COURSES (13 EC)	INTERNSHIPS (18 EC)
PROFILE COURSES (16 - 17 EC)	
LITERATURE STUDY (12 EC)	MASTER THESIS PROJECT (42 EC)
RESEARCH METHODOLOGIES (2 EC)	
ELECTIVE COURSES (16 - 17 EC)	

Wind Energy Profile

The wind energy profile covers method and systems of energy extraction from wind. Both wind turbine and kite power systems are considered. Profile courses include: Airborne Wind Energy, Wind Turbine Design, Site Conditions for Wind Turbine Design and Wind Turbine Aeroelasticity. After successful completion of the MSc programme you:

• Will have in-depth knowledge of low speed aerodynamics and its application to energy extracting devices such as wind turbines and kites.
• Will have thorough systems knowledge regarding these energy extraction devices.
• Will be able to apply advanced analysis and design techniques in at least one of the following areas: wind turbines, wind farms or kite power systems.
• Will have insight in related disciplines such as boundary layer meteorology, structural design and dynamics of structures, control and operations.

Career prospects

Graduates specialised in Aerodynamics are eminently qualified to work in the design of air and land transportation systems. Given their knowledge of flow physics and experience with experimental and computational techniques, there are also opportunities in the large number of industries where flows play an important role, such as offshore engineering, resource extraction, and process engineering, to name a few. Since the Aerodynamics specialty has a substantial fundamental component, its graduates are also well prepared for careers in fundamental or applied research.

For graduates specialised in Wind Energy, the recent rapid expansion in the number and size of wind turbines offers ample opportunities in the wide diversity of fields that make up the wind energy industry, including wind turbine manufacturing and engineering, wind farm development, consultancy, financial services, and research and academia.

Student profile

If you have affinity with physics of fluids, numerical mathematics, experimental research and sustainability, you can find your place in the Aerodynamics and Wind Energy Track. We will offer you a challenging Master program, in which you have next to freedom, also responsibility to shape and plan your curriculum.

If you wish to be optimally prepared, please review the following expected prior knowledge / skills:
Aerodynamic theory:
 John D. Anderson jr., Fundamentals of Aerodynamics, McGraw-Hill, Chapters 1-10.

Basic programming skills (either Matlab or Python):
An Introduction to Programming and Numerical Methods in MATLAB, S.R. Otto and J.P. Denier.

4th
QS World Ranking (faculty)

45%
International students

Career perspective

79%
Job within 3 months

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