FAQ

GENERAL

When does the new Master DS&AI start?
The program will start in September 2021. We are very pleased to announce that the NVAO has taken a positive decision on accreditation of the new Master DS&AI. The Master DS&AI will soon be registered in the official educational program register of the Netherlands (i.e. CROHO).

What kind of diploma do I get when I finish my Master’s degree DS&AI?
When you finish your Master’s degree DS&AI you are Master of Science (MSc) in Data Science & Artificial Intelligence and you will receive a DS&AI-diploma. When you obtain the diploma, you will have developed a scientific perspective on the core of Data Science and Artificial Intelligence combined with an engineering approach that forms an excellent foundation for a successful career.

Is there a minimum number of students required will this Master start in September 2021?
No. There is no minimum number of students required to start this Master in September 2021.

ENROLLMENT

When and how can I enroll for the new Master DS&AI?
This program will soon be registered in the official educational program register of the Netherlands, so from that moment on you can register for this new Master program via Studielink. As soon as the program is in the official educational program register of the Netherlands, you can check this website for a roadmap on how to prepare and hand in your application.

I am an international student and want to apply as soon as possible. What shall I do?
The program will be registered soon. In case you really cannot wait with starting the application process, you can submit your application for DS&AI under the ‘Data Science in Engineering’ track. We will switch your application over to DS&AI as soon as this is possible, if you meet the admission criteria for the Master DS&AI.

Will I be automatically enrolled in the new Master program DS&AI when I sign up for the track DSiE?
With the start of the new Master DS&AI we will stop new enrollment in the track DSiE. (Students already enrolled in DSiE in previous years can finish the DSiE program in typical time.) Students who register for the track DSiE for academic year 2021-2022 and meet the admission criteria for the Master DS&AI are therefore automatically enrolled in the DS&AI program.
Please note: admission to the track DSiE does not automatically give you admission to the Master DS&AI, as the Master DS&AI has more specific admission requirements. So, if you are interested in the Master DS&AI, we advise you to register for that program (and not for the track DSiE), so you will be informed as soon as possible if you are eligible.

I’m already in the track DSiE. I would like to switch to DS&AI in September 2021. Is this possible?
To enroll in the Master DS&AI, you have to satisfy the admission criteria of DS&AI (detailed below), which are different from the admission criteria of the DSiE track. Whether you can indeed switch to DS&AI will be decided by the admission committee of DS&AI. Note that you can only start your graduation project in DS&AI in the academic year 22-23 and only graduate at earliest by the end of the academic year 22-23, regardless of your study progress in the DSiE track.
What is the application deadline?
The deadline to enroll in a Masterprogram is May 1st 2021. You need to apply via Studielink, the national information system where you need to register if you want to do a higher education program.

Should I enroll in the new Master DS&AI if I would like to do the EIT Digital Data Science or BDMA program?
If you want to follow the EIT Digital Data Science Master program or the BDMA Master program, please apply and enroll directly at these programs. Through these programs, you then can follow courses of the DS&AI Master during your year at TU/e.

ADMISSION REQUIREMENTS

Which are the admission criteria?
To be admitted to the Master’s program DS&AI you will have to have satisfy the following criteria:
• Knowledge and skills acquired from a BSc level research university degree, equal to a Dutch university BSc degree level.
• One or more passed courses in each of the following subjects (important criteria are both the study load and academic performance):
  • Logic and Set Theory
  • Linear Algebra
  • Probability and Statistics
  • Algorithms and Data Structures
  • Data-Modeling and Databases
  • (Object-oriented) Programming and applying programming for problem solving
  • (Data)Visualization
  • Data Mining/Machine Learning
  • Group project work, that includes professional skills as teamwork, presenting and writing.
Here you will find a detailed explanation of the admission criteria.

With which Bachelor-degree can you be directly admitted in the new Master’s program?
Students with a BSc level research university degree equal to a Dutch university BSc degree level and at most three missing subjects from the list of admission criteria (at most 15 ECTS of study load to acquire the missing knowledge) can be admitted directly to the Master’s program; the missing subjects will be added as homologation courses to the Master’s program.

TU/e Bachelor Computer Science and Engineering students can be directly admitted in the new Master’s program, with Linear Algebra and Visualization as homologation subjects. Bachelor Computer Science and Engineering students who take the following subjects electives in the Bachelor can be admitted without homologation subjects:
• Linear Algebra (e.g., 2DBI00, 2WF20)
• Visualization (e.g., JBI100)

Joint Bachelor Data Science students who take at least two of the following subjects as electives in the Bachelor can be admitted to the new Master’s program (with the remaining subjects as homologation subjects). Taking all subjects as electives allows admission without homologation subjects. These subjects are also included in two coherent elective packages (Computer Science for Data Science & Data Modeling Foundations):
• Linear Algebra (e.g., JBM070, 2DBI00, 2WF20)
• Logic and Set Theory (e.g., 2IT60)
• Data Modeling and Databases (e.g., JBI050, 2ID50)
• Algorithms and Data Structures (e.g., 2IL50)
• Data Mining/Machine Learning (e.g., 2II0)


TU/e Bachelor Applied Mathematics students who take at least one of the following subjects as electives in the Bachelor can be admitted to the new Master’s program (with the remaining subjects as homologation subjects). Taking all subjects as electives allows admission without homologation subjects. These subjects are also included in two coherent elective packages (Data and Algorithmic Foundations for Mathematics & Data Analysis Foundations for Mathematics):

- Data Modeling and Databases (e.g., 2ID50)
- Algorithms and Data Structures (e.g., 2IL50)
- Visualization (e.g., JBI100)
- Data Mining/Machine Learning (e.g., 2IIG0)

**How can I determine whether I can enroll with my Bachelor degree?**

Here you can check the admission criteria to see if you are admissible in the new Master program. If you have any questions left about admission or admission criteria you can send an e-mail to the academic advisor.

Please note that we cannot check your application or CV at this address. To find out if you are admissible, you need to apply on Studielink (see below).

**How can I determine which courses I need to take to be able to enroll in the DS&AI program?**

The elective packages for the Joint Bachelor Data Science (Computer Science for Data Science & Data Modeling Foundations) and for the Bachelor Applied Mathematics (Algorithmic Foundations for Mathematics & Data Analysis Foundations for Mathematics) provide sets of courses that can be taken to acquire the required prior knowledge for the new Master’s program. Consult the Academic Advisor of your Bachelor program if you require more information about which courses you need to take to acquire the necessary knowledge.

**I didn’t take the right electives during my bachelor, but I still want to enroll in the Master DS&AI. Is this possible?**

Students with a BSc level research university degree equal to a Dutch university BSc degree level and at most three missing subjects from the list of admission criteria (at most 15 ECTS of studyload to acquire the knowledge) can be admitted directly to the Master’s program, the missing subjects will be added as homologation courses to the Master’s program. Students who require more than 15 ECTS of studyload to acquire the missing knowledge – for the time being – cannot be admitted to the Master’s program of DS&AI.

We are in the process of setting up a Pre-Master’s program of 30 ECTS to allow students to acquire the missing knowledge. We will inform about the Pre-Master’s program when it has been prepared and approved.

**Where can I send my academic transcript to get a check whether I am admissible to the DS&AI Master program?**

An official application can be submitted via this website, which will be assessed by the official admission committee of TU/e. We cannot review your application outside the official admission process.

**What is the minimum GPA needed?**

Any student with a BSc level research university degree equal to a Dutch university BSc degree level (and with the necessary prior knowledge) can be admitted.

Students with an international Bachelor degree in a relevant field and with the required prior knowledge have to apply for admission via the admission committee. Please, visit the TU/e Admission and Enrollment page for more information about admission and other requirements.
Is there a Pre-Master available? What does it consist of?
To apply for a Master’s degree program at TU/e you need to have the required level of prior education. Our Pre-Master programs exist to help students make up for any deficiencies between a particular Master’s degree program’s entry requirements and their previous Dutch HBO or Dutch Bachelor’s degree programs. A Pre-Master program consists of a maximum of 30 ECTS worth of courses and will take you about 6 months to a year. Completing a Pre-Master program does not give you a Bachelor’s degree. Instead, you will receive admission to the matching Master’s degree program.
Before you can start with a Pre-Master program at TU/e, you need to meet the English proficiency requirements. Most Pre-Master programs also require confirmation that you have a sound level of mathematics. More about the Pre-Master programs can be found here.
The Pre-Master program for Data Science and Artificial Intelligence has not been designed yet, information about the Pre-Master’s program will be shared once available.

COURSES

What is the set-up of the curriculum?
During the two years of your Master program you will follow core and specialization courses, electives and professional development courses, possibly do an internship and carry out your final graduation project. Read here more about the curriculum.

Which courses form the core of the Master DS&AI? What topics will be addressed in the program?
The DS&AI program is structured into the following trajectories and subjects, each representing an expertise area of Data Science & Artificial Intelligence. Most subjects are new (*) or have been redesigned for the new Master DS&AI.

1. Data Engineering and Management
   - Big Data Management
   - Engineering Data-Intensive Systems
   - Principles of Data Protection
   - Knowledge Engineering*

2. Algorithmic Data Analysis
   - Algorithms for Geographic Data
   - Topological Data Analysis

3. Explainable Data Analytics
   - Visual Analytics*
   - Foundations of Process Mining*
   - Advanced Process Mining

4. Statistics
   - Longitudinal Data Analysis*
   - Statistical Learning Theory
   - Statistics for Big Data
   - Time Series & Forecasting

5. Data Mining and Machine Learning
   - Research Topics in Data Mining*
   - Machine Learning Engineering*
   - Deep Learning

6. Artificial Intelligence and Machine Learning
   - Foundations of AI*
   - Generative AI Models*
   - Uncertainty Representation and Reasoning*
Each trajectory has a different set of compulsory courses that provide foundations to continue in the trajectory. In the mandatory part of the program, at least four of these compulsory courses from the above expertise areas must be taken. In addition, the following two mandatory courses connect the different expertise areas and give context:

- Ethics in Data Science & Artificial Intelligence*
- Data Intelligence Challenge (a challenge-based group project course)*.

The Master will grow and evolve in the coming years with more subjects being added to the program including:

- Explainable AI*
- Text Mining*
- Reinforcement Learning*

In the specialization part of the program, a student chooses further specialization in at least two of the above trajectories (by taking several courses) and acquires knowledge from two further subjects for a broader understanding of the field.

**What new courses have been developed?**
The program will include new courses on the following subjects (some of the subjects will only be offered from the second year of the program onwards):

- Data Intelligence Challenge
- Ethics in Data Science and Artificial Intelligence
- Knowledge Engineering
- Visual Analytics
- Foundations of Process Mining
- Longitudinal Data Analysis
- Research Topics in Data Mining
- Machine Learning Engineering
- Foundations of Artificial Intelligence
- Uncertainty Representation and Reasoning
- Generative AI Models

**What will be the entry requirements of the (new) courses?**
The Graduate School regulations are leading in this: for core courses, there will be course entry requirements that are based on the program entry requirements. For non-core courses only prior knowledge.

**In which courses do I get in touch with practice? How is application of the theory included in the Master program?**
The majority of courses incorporate assignments and project work in which students apply theory on concrete cases and real-life datasets. The Data Intelligence Challenge included in the program is a project-based course entirely devoted to solving a real-life challenge in a group. Finally, students get to apply and develop techniques in practical contexts during internships and in the final graduation project.

**Statistics is not my cup-of-tea; how important is this subject in the program?**
Statistics provides one of the mathematical foundations to Data Science and Artificial Intelligence, allowing to relate and reason about point-wise observations with large populations and models in the presence of uncertainty and incompleteness. It provides a fundamental toolset for any Data Scientist and AI Engineer for making quantifiable statements about their approach and results in a trustworthy and reliable manner. For this reason, Statistics is included in the core program and assumed prior knowledge by many core and specialization courses. The program aims to give students from all backgrounds a gentle start into this crucial topic on a Master-level and offers several follow-up courses along the Statistics trajectory.
ELECTIVES

In which subjects can I specialize in this Master? Which electives can be chosen?
Each of the six DS&AI course trajectories continues with elective courses presenting state-of-the-art, specialist knowledge on expertise areas in Data Science and Artificial Intelligence and is closely connected to the research in our research groups.
In the Master DS&AI, you then specialize yourself in at least two of the program’s expertise areas by choosing two of the six course trajectories as ‘major’ trajectories and taking several coherent courses in each. The six course trajectories are:
1. Data Engineering and Management
2. Algorithmic Data Analysis
3. Explainable Data Analytics
4. Statistics
5. Data Mining and Machine Learning
6. AI and Machine Learning

Furthermore, you broaden your expertise by taking two more courses from other DS&AI trajectories that are not your major ones. Through these choices you prepare yourself for your graduation.

The Master will grow and evolve in the coming years with more subjects being added to the program including:
- Explainable AI
- Text Mining
- Reinforcement Learning

Are all combinations of specialization (i.e. trajectories) possible?
Yes, all combinations of two ‘major’ specialization are possible. However, in case a study program requires to take specific homologation subjects, some combinations may not be possible to complete within a regular program.

How about other electives from different faculties, e.g. JADS?
You may continue studying more subjects from other expertise areas of Data Science & Artificial Intelligence or study subjects from other areas you find interesting. You are not restricted to any subjects. You may use your electives options to study technical or non-technical topics of your choice to broaden your perspective so you can also choose courses from other departments at TU/e, from other universities or JADS, and even from universities abroad. For this, an approval of our Examination Committee is needed.

When do I need to have composed my elective program?
There is no mandatory deadline to finalize your choices for your elective program. Prior to starting your graduation project, you need to have compiled a study program that satisfies all program requirements. From a practical point of view, you can begin the program with core subjects only and gradually start making choices as you learn more about each of the specialization areas. By the end of the first semester until the middle of the second semester you will know enough about the expertise areas to compose your elective program.

What guidance is offered in choosing my electives?
Being part of the TU/e Graduate School, you will be assigned a mentor to help you in reflecting on your professional development and study choices. Further, a program guide will offer several example programs to support you in building your study program.
PROGRAM MISCELLANEOUS

Can students also start in February with the new Master DS&AI?
The order of core courses and electives in the program is designed for starting your studies in September. Starting in February is in principle possible, but you will follow some courses in a different order than they were designed for and you may not be able to follow all trajectory combinations. This also depends on how many/which homologation courses student might have to follow. This only applies from February 2022, as the new Master will start in September 2021.

How can an international component be embedded in the program?
International ambitions are possible to schedule. However, this requires planning and flexibility, for instance that students work on their graduation preparation project abroad.

Can I do an internship?
Yes, doing an internship is possible as part of the program. Most students choose to conduct the graduation project within a company or external organization.

Will the DS&AI Master also be available part-time?
We will organize this program as a full-time program, i.e. it is designed so that students can complete the program within two years when studying full-time.

Is the emphasis in this Master program more on Data Science or more on AI?
The Master’s program on Data Science and Artificial Intelligence forms a bridge between both fields which share a large number of methods and techniques, not only Machine Learning but also algorithmics, visualization, and various statistical methods. The program core will give you foundations in all expertise areas of both fields. Through your specialization electives, you can choose to focus either on one of the fields or to obtain expertise in both fields.

How does this Master relate to Artificial Intelligence Engineering Systems (AIES), the new track of Electrical Engineering (EE) and Mechanical Engineering (ME)?
The Master DS&AI will have a focus on foundations, development, and research in Data Science and Artificial Intelligence. The track Artificial Intelligence Engineering Systems (AIES), offered by both Electrical Engineering and Mechanical Engineering, will focus on application of AI to complex engineering systems, e.g. in the areas of high-tech systems, robotics, health or mobility.

How does the Master DS&AI compare to existing Masters at TU/e or in the Netherlands?
The Master DS&AI is intended for students interested in studying, researching, combining advanced data analysis techniques with AI methods and techniques, with the aim of understanding, using and developing intelligent systems to support and strengthen the human intellect. This Master’s program is the first and only engineering program in the Netherlands in which advanced techniques and methods in the field of Data Science and Artificial Intelligence are combined.

AFTER THE MASTER DS&AI

How about the possibilities for a PhD position?
The new Master DS&AI enables you to continue with a PhD trajectory, for instance with a research track.
**What kind of job could I find after finishing this master?**
Graduates in Data Science and Artificial Intelligence will have developed a scientific perspective combined with an engineering approach that forms an excellent foundation for a successful career. There are numerous fields in which Data Science and AI are applied, for example research laboratories, banks, (government) organizations, hospitals, multinationals and internet companies, such as: Nike, ProcessGold, ING, ABB Corporate Research, Gartner, King, Microsoft, MessageBird, ABN AMRO, Skidata AG, KPMG, Celonis, Fit Analytics, GuanData, Wolfpack IT, ASML, RepubliQ, Zalando, Shopee, Shell, Hexagon Manufacturing Intelligence, Netlight, Transparent, EOS Spain SL, Target Holding, ContentWise, KLM, Scania Group, Cognizant, DLL, Tata Steel, JADS, BBVA, Reinsight, IE Business School, TNO, Futurice, Vanderlande, and Philips.

**Can you say anything about the job market prospects?**
The demand on the labor market for higher educated people in science and technology is high and still growing. This certainly applies for technicians trained in Data Science and Artificial Intelligence. Graduates from TU/e all find a job within three months after graduating.

**MISCELLANEOUS**

**How about the current track DSiE? Will it continue to exist?**
The track DSiE will no longer be offered to new students from September 2021. All students already following this track will be able to continue and complete their studies of the DSiE track within a typical time (in case of very long study delays, special arrangements will be made).

**How is EAISI involved?**
The Eindhoven Artificial Intelligence Systems Institute (EAISI) is the institute of TU/e in the field of Artificial Intelligence. EAISI provides the environment and organizes meetings and activities for all students, lecturers, and researchers in Artificial Intelligence active at TU/e to meet and exchange ideas and develop and advance the field AI together in a multi-disciplinary way. The Master’s program DS&AI is part of these initiatives.

**How is JADS involved?**
It is possible to also choose electives from JADS. TU/e is a strategic partner in JADS. This Master is complementary to the other JADS-related Master programs.

**What will the program cost?**
Studying involves different kinds of university expenses. There are, for example, the costs of tuition fees, books and other study materials, a laptop and the costs of renting a room.

**Do you have scholarships?**
Various scholarships are open to students wishing to follow a Master’s program at TU/e. A requirement of most scholarships is that you have been admitted to a Master’s program before you may apply to the scholarship. It is therefore important that you take note of the scholarships deadlines and apply well in advance to the TU/e Master’s program of your choice in time to meet the scholarship deadline. Students from countries of the European Economic Area (EEA) may be eligible for a grant or loan from the Dutch government. Check the website of DUO if you qualify for student finance.