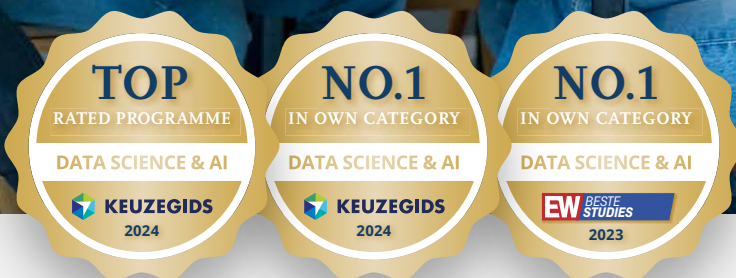


Work with our students

Placement and graduation assignments



Data Science & AI



CREATING MEANINGFUL EXPERIENCES



As a partner in the Data Science & Artificial Intelligence industry, we would be happy to work with you. The students of our professional bachelor's programme of Applied Data Science & Artificial Intelligence (ADS&AI) can be set to work for you on a placement or graduation assignment or another type of practical assignment.

Applied Data Science & Artificial Intelligence

The professional bachelor's programme of Applied Data Science & Artificial Intelligence prepares students for careers in the international world of Data & Artificial Intelligence. The programme, a project-based curriculum, has a practical orientation and offers collaborative learning in integrated multidisciplinary projects where students learn to continuously develop themselves as professionals.

Highly qualified and international lecturers with years of experience in the industry deliver their expertise to the students. In their projects and study units, our students explore various types of data and Artificial Intelligence applications.

- > In year 1 students work on four ten-week projects: Introduction to Data Science, Predictive Analysis Using Machine Learning Algorithms, Computer Vision Using Neural Networks, and a Capstone multi-source data and deployment project.
- > In the second year, students take part in projects such as Research, Computer Vision & Robotics, Natural Language Processing, and a Deployment project.
- > In years 3 and 4 students can choose their own study pathway and project(s). They start year 3 with a cross-disciplinary project with students from other BUAs programmes and do a placement in the second half of the year.
- > In year 4 they start with a minor or a placement and finish their year with a graduation project. After they have completed this, they are available as employees for your company or organisation.

Programme Facts

- > English-taught
- > Four years, three-year fast-track available to pre-university graduates.
- > 20-week placement in the third or fourth year
- > Graduation assignment in final semester
- > Degree title: Bachelor of Science
- > Career examples: Data Scientist, Machine Learning (ML) Engineer, Analytics Translator, AI Consultant

About Breda University of Applied Sciences

Breda University of Applied Sciences (BUAs) is a specialist and global higher education organisation in Breda, the Netherlands.

On our green and small-scale campus and in our diverse learning communities, students, staff and industry partners empower each other to shape a better world by Creating Meaningful Experiences.

They do so in the fields of Tourism, Leisure & Events, Hotel & Facility Management, Built Environment, Logistics Management, Games, Creative Business and Data Science & AI.

For more information, please go to BUAs.nl/en.

CURRICULUM APPLIED DATA SCIENCE & ARTIFICIAL INTELLIGENCE

YEAR 1

SEMESTER 1 - BLOCK A	SEMESTER 1 - BLOCK B	SEMESTER 2 - BLOCK C	SEMESTER 2 - BLOCK D
<p>Our World in Data: Using data to understand global issues</p>	<p>Predictive Analytics using Machine Learning</p>	<p>Responsible Design of Deep-learning based AI using Human-centered design</p>	<p>Capstone Project: Data Science Lifecycle Management using CRISP-DM</p>
<ul style="list-style-type: none"> > Introduction to AI & Data Science > Introduction to data-driven storytelling with Power BI > Introduction to programming in Python 	<ul style="list-style-type: none"> > Libraries: Pandas & Numphy > Introduction to Machine Learning Algorithms > Calculus/Linear Algebra > Data governance (ethical & legal frameworks) 	<ul style="list-style-type: none"> > Introduction to Deep learning > Responsible & Explainable AI > Human-centered AI 	<ul style="list-style-type: none"> > Agile project management > Cooperation in groups > Data Engineering > Stakeholder Management

YEAR 2

SEMESTER 3 - BLOCK A	SEMESTER 3 - BLOCK B	SEMESTER 4 - BLOCK C	SEMESTER 4 - BLOCK D
<p>Digital Transformation, Data and AI Maturity Quick Scan</p>	<p>Robot Vision and Control: Computer Vision applied to Robotics</p>	<p>Natural Language Processing</p>	<p>Capstone Project: Deploying Machine Learning algorithms using the MLOps framework</p>
<ul style="list-style-type: none"> > Digital Transformation & Change Management > Research Methods > Probability theory > Academic Skills 	<ul style="list-style-type: none"> > Computer Vision > Robotics and Reinforcement learning > Visual Cognition > Calculus: a primer 	<ul style="list-style-type: none"> > Text Mining > Natural Language Processing > Speech Cognition 	<ul style="list-style-type: none"> > Advanced programming concepts > MLOps: frameworks > MLOps: tools

YEAR 3

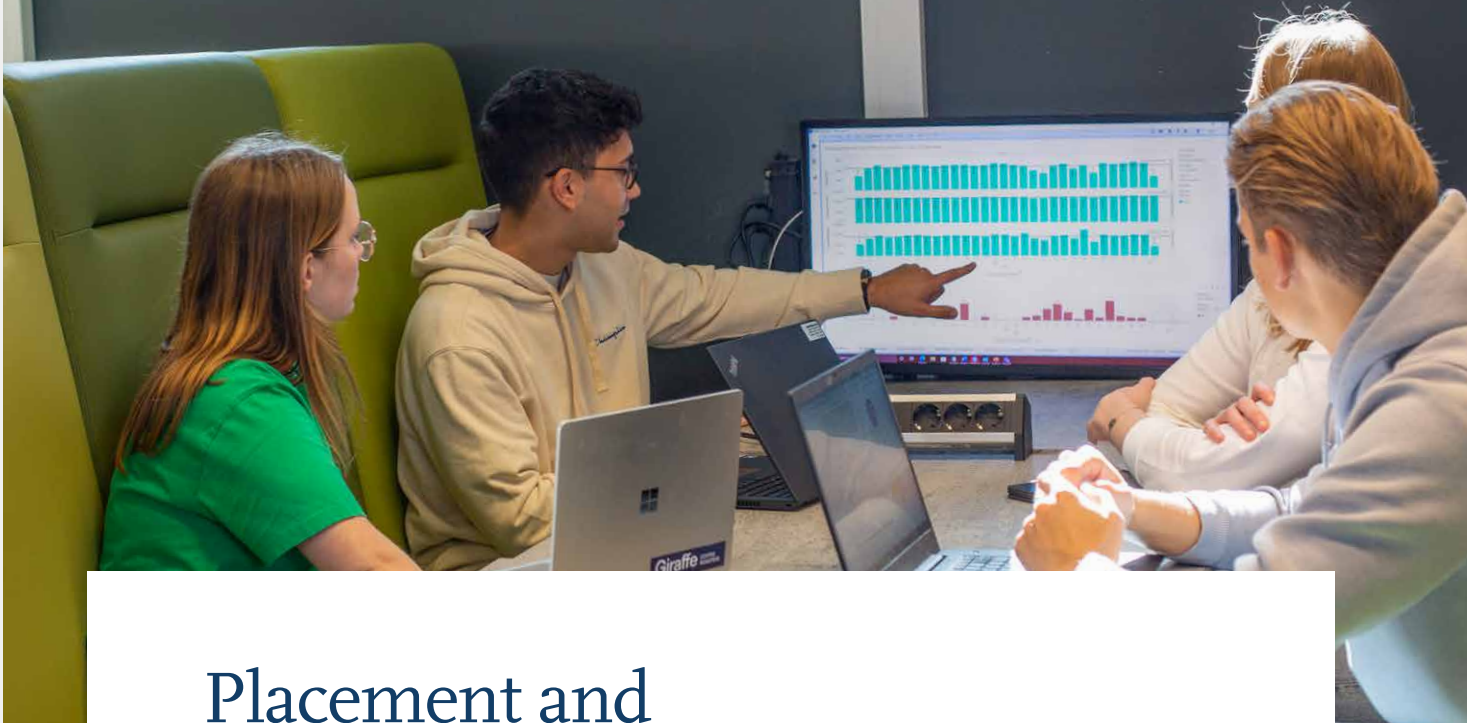
SEMESTER 5	SEMESTER 6
<p>Specialisation project 1: Role and domain specialisation</p>	<p>Choose from: Specialisation project 2 Work Placement Exchange abroad Minor</p>

YEAR 4

SEMESTER 7	SEMESTER 8
<p>Choose from: Work placement Exchange abroad Connection to university BUAs-wide Minor</p>	<p>Graduation Project</p>

Good to know

- > Our Applied Data Science & Artificial Intelligence programme has recorded high scores in Keuzegids HBO, an independent guide that assesses and compares the quality of higher education programmes in the Netherlands.
- > Two-thirds of our students and most of our lecturers come from all over the world. International recognition underlines the quality of our education.
- > Our programme has the special feature of 'small-scale and intensive education', awarded by the NVAO (Accreditation Organisation of the Netherlands and Flanders). This allows BUAs to select the best students.
- > Our students operate in the DataLab, where they work on real-life projects in all years of study. This means that they are available at short notice and that they handle projects expeditiously.



Placement and graduation assignments

Our students are widely employable in the Data and Artificial Intelligence industry. They are able to carry out assignments in the fields of data collection, data modelling (using machine learning and deep learning algorithms), data visualisation, and data engineering/deployment. Moreover, they can set up and execute a research project for your company

As early as their first year of study, students work in our DataLab on assignments from the industry which they carry out under the supervision of our lecturers. As a result, students gain a great deal of practical experience before they start a placement or Capstone graduation project.

Placement and graduation assignments are important parts of the curriculum. They are aimed at giving students the opportunity to apply their acquired knowledge and skills to real-life, professional situations to learn from this process. The student is adaptable to the ever-changing data and AI landscape, a critical thinker and has an innovative mindset. During these periods, students will be required to develop several competencies (or develop them further) as defined by the degree programme staff.

Your company would like to offer the student an opportunity to acquire experience at a higher professional level. This means that the student should be enabled to:

- > apply knowledge and skills obtained in the field of data and artificial intelligence in a professional and well-founded manner;
- > make decisions based on data and interpret relevant information.

During a graduation assignment period, a student may tackle a company-specific issue in the field of data and artificial intelligence. Answers cannot always be found in the existing professional literature and our students have both the time and expertise to carry out customised research. This can even be used for creating a concept or prototype. Based on the conclusions, the student will make relevant, directly applicable recommendations for you.

Student availability

- > Our students are available for a placement of 20 weeks in their third or fourth year of study.
- > Placements start every year in September or February. Alternative start dates may be negotiated.
- > In their fourth year of study, to carry out the final graduation assignment, students are available from February onwards for a 20-week assignment.



How can our students help you?

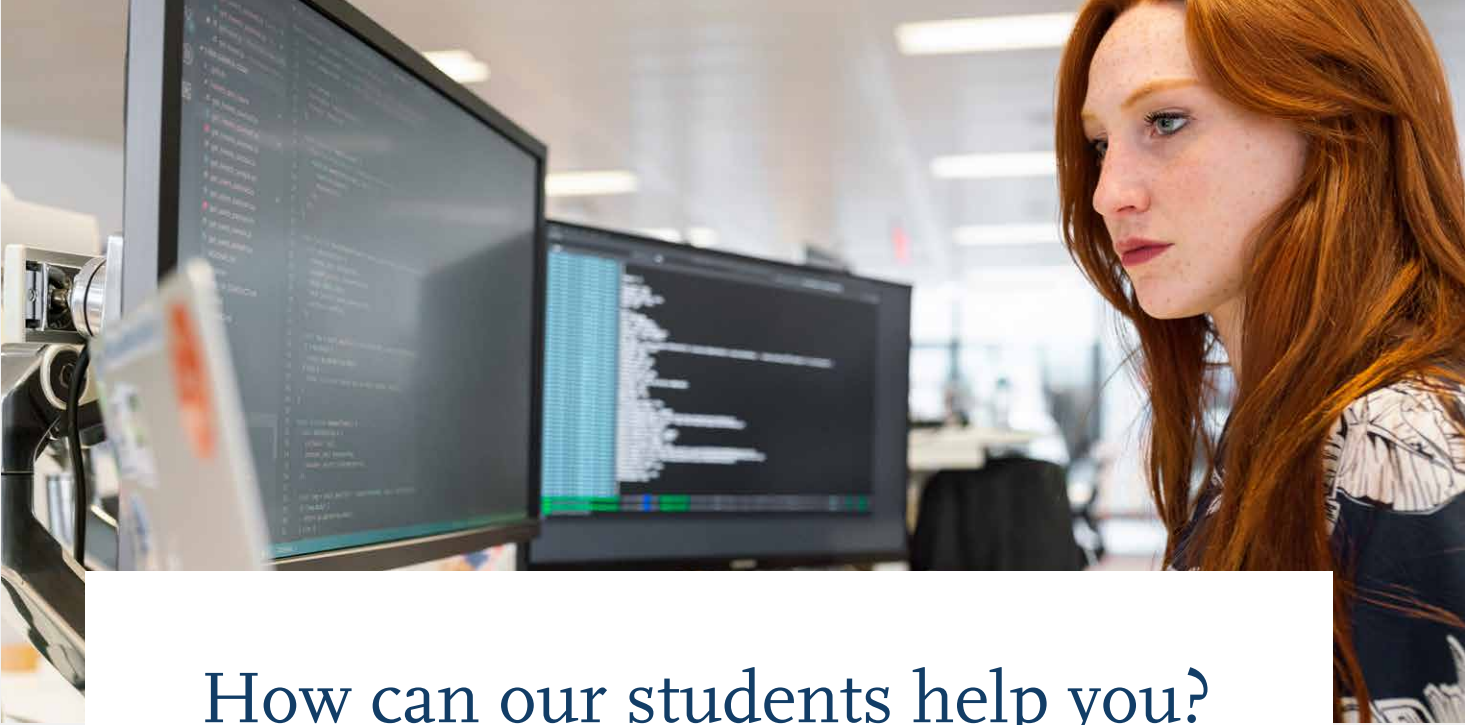
Placements

During a placement, the student assists in the day-to-day business of your company, focusing on specific learning targets. When our students graduate, they could apply for roles such as data analyst, data scientist, machine learning engineer, data engineer, Natural Language Processing (NLP) specialist, computer vision specialist, data manager/consultant, or analytics translator. The tasks they will work on during their placement should be related to tasks often performed in these roles.

Workday activities may include, but are not limited to:

- > Creating a pipeline for collecting, cleaning, and writing data to a database
- > Training, evaluating, or fine-tuning a Machine Learning Model
- > Creating dashboards
- > Working with GitHub and collaborating on codebases within a larger team
- > Training and implementing chatbots
- > Participating in code reviews
- > Performing statistical analyses
- > Labelling datasets and developing tools for automating the labelling pipeline
- > Deploying machine learning models
- > Developing data management plans and guidelines
- > Implementing MLOPs processes
- > Implementing cloud solutions for ML pipelines and serving
- > Creating ML/AI applications
- > Evaluating existing ML models in terms of bias and fairness





How can our students help you?

Graduation assignments

Research by our students can contribute to solving issues in your organisation using data.

Examples of graduation assignment topics are:

- > Designing a model for image recognition tasks such as medical scans, or security camera footage
- > Creating an algorithm to detect hate speech, fake news or discriminative language
- > Implementing an algorithm for ranking items based on reviews or other filtering features
- > Creating a chatbot for customers to implement on your website as a first point for help
- > Optimisation of recommender model to provide customers with more personalised offers while shopping or in the travel industry
- > Assisting in automating routine tasks, whether in customer service, data entry, or other areas, to free up human resources for more complex tasks
- > Implementing speech-to-text, large language models, and text-to-speech pipelines for various use cases from improving immersion in games to improving the customer experience in the hospitality industry
- > Integrating computer vision and/or Natural Language Processing models into robotics workflows to improve automation and/or human robot interaction
- > Streamlining the data collection, cleansing, model execution, and visualisation using any tools. For instance, a sample project including Azure database, model execution in a cloud instance, providing the results in PowerBI dashboard
- > Providing an Anomaly Detection framework to identify and support Root Cause Analysis

All assignments focus on the added business value that can be provided by implementing data-driven and ML/AI solutions.





How can our students help you?

Datalab

Our programme has the distinctive feature of ‘small-scale and intensive education,’ awarded by the NVAO. This has everything to do with our unique student in-house training company called the DataLab. In a real-life context and in all years of the degree programme, our students acquire experience in management (including project management and leadership) and customer communication.

What can our students make?

- > In the DataLab, students carry out a wide variety of assignments. Data analysis, data collection, data visualisation and deployment of models all are subject to students’ activities. They are familiar with AI applications such as image recognition, computer vision, robotics, Natural Language Processing and can set up data warehouses and pipelines.
- > In the third year, students collaborate with domain experts (students from other bachelor’s programmes of BUAs) in the field of Tourism, Leisure & Events, Media, Hotel Management, Facility Management, Logistics or Built Environment on domain-specific projects. These projects can be done by these mixed groups for you.

Portfolio

A few examples to give you an idea of the products our students have worked on in the past:

- > Image segmentation to detect plant roots, measure root length and detect root tips. Use these models as input to robotic systems to automate the inoculation at the root tip
- > Predictive analysis on viewer ratings for OP1, a talk show on Dutch television
- > Speech-to-text models
- > Sentiment analysis from text
- > Automatic detection and localisation of consumer goods using computer vision and using this as input to a robotic control model trained with reinforcement learning for fast and accurate picking and placing of goods
- > Training and deployment of ML models in the cloud implementing the latest MLOPs processes. Models are deployed as modular APIs for easy integration with frontends and other services

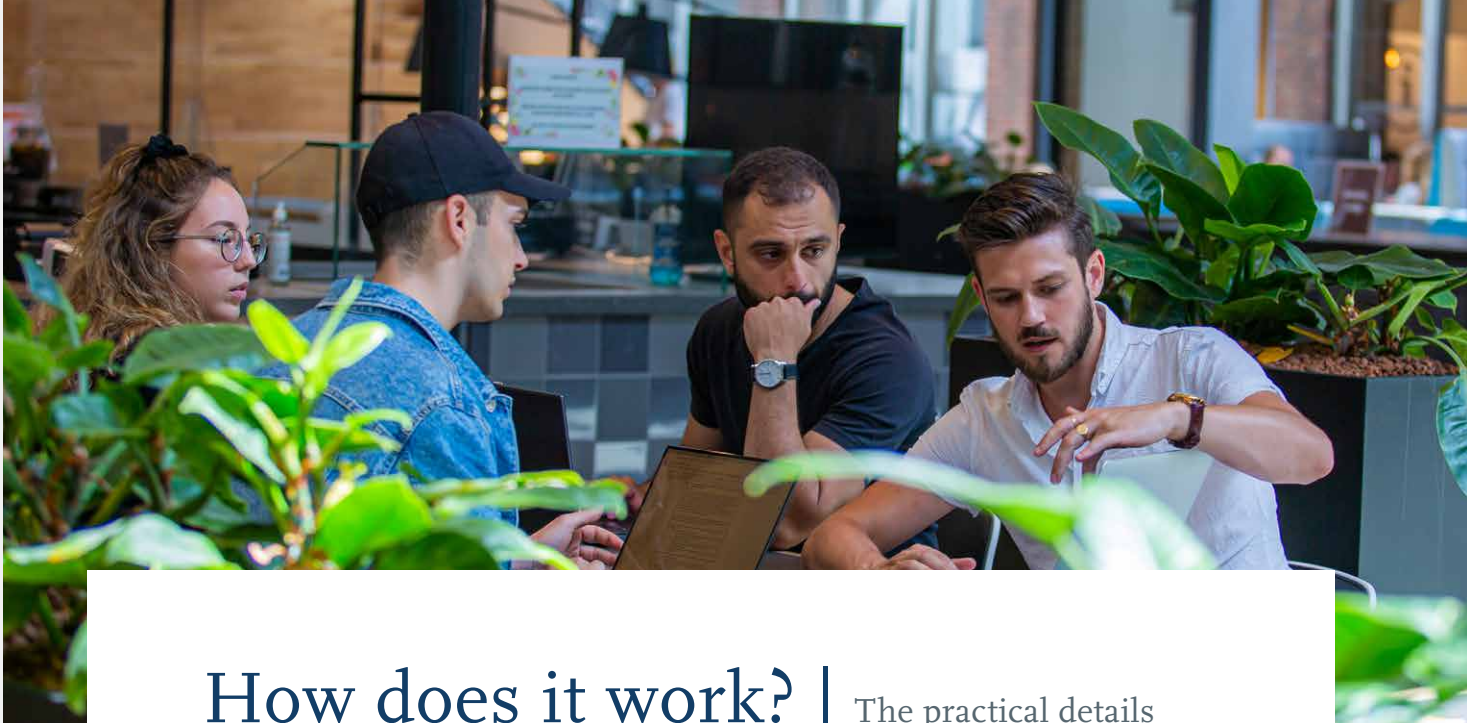


The programme focuses on hands-on learning

“Working as a data scientist in the multimedia industry has always appealed to me, so choosing the ADS&AI study programme at BUAs made perfect sense. Working with real-life data and collaborating with industry partners, the programme focuses on hands-on learning. In the first year, for example, we had the opportunity to work with Banijay Benelux, a TV production and distribution company. We were tasked with analysing the factors that influence the engagement and ratings of Banijay’s news talk show OP1. Projects like these really help you to develop the skills needed to work in the industry, such as working in a scrum team and handling data in accordance with ethical guidelines.”

Rebecca Borski

Applied Data Science & Artificial intelligence student



How does it work? | The practical details

Datalab assignments

If you have an assignment that you would like our students to work out in our DataLab, please contact us via **AGMplacementoffice@buas.nl**

- > A first meeting will be scheduled with you as a client and the project coordinator of the DataLab, during which the assignment is discussed, and the result defined. In this meeting, we will also determine whether the assignment can be completed within the time and resources available. Afterwards, the assignment brief is drawn up.
- > Next, a team of students, supervised by our lecturers, will set to work. They will do so for two days a week throughout the duration of the project. Together we strive for professional quality. However, for the students it is a learning process, which is why the price you pay is considerably lower than the fee you would be charged by a professional company.

Placement and graduation opportunities

Our students would be happy to work for you. Below you will find several matters that are important to you if you wish to engage one or more ADS&AI students.

- > On the part of the degree programme, the student will be supervised by a lecturer. The role of this supervisor comprises, among other things, advising the student and the host company about the specific details of the placement and the execution of the assignment. The supervising lecturer will assess the student's performance.
- > Your company has at least five permanent employees or your company employs at least three professionals who work on Data Science & AI projects. Your company operates (and/or has clients) at national or international level. You will appoint a company supervisor to introduce the student within your organisation and to supervise the student in a manner that focuses on the student's work and assignment.
- > Students are not allowed to carry out a project or assignment entirely on their own, due to the associated responsibility level (including financial responsibilities). They work as an assistant to the manager who is ultimately responsible and/or the supervisor within your company.
- > The host company offers a professional workplace and preferably a reimbursement for costs incurred (travel expenses, accommodation). Whenever possible, students arrange their own insurance and, if necessary, a work permit and visa.

Would you like to get inspired? Check out Datascience-AI.BUas.nl



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