



# Studying at HAN University of Applied Sciences - Faculty of Engineering Exchange Program 2018-2019



HAN University of Applied Sciences strives to be one of the top universities of applied sciences in the Netherlands. HAN has over 30,000 students and offers a broad range of professional courses. This leaflet gives an overview of ' \$ exchange courses offered at HAN in the fields of engineering, built environment, applied sciences, IT and communication.

### HAN Faculty of Engineering

The HAN Faculty of Engineering offers Bachelors and Masters courses in the fields of engineering, automotive, built environment, biosciences, chemistry and Information technology, media and communication. A number of these degree courses are offered entirely in English. Exchange courses are offered as part of these Bachelor degree courses.

### Research

HAN has nationally recognised expertise in the fields of automotive engineering, biodiversity and sustainable electrical energy. If you are looking to specialise in one of these areas, HAN University of Applied Sciences is the place to be! You can find more information at [www.han.nl/research](http://www.han.nl/research).

### Good Facilities

HAN's campuses in Arnhem and Nijmegen have everything you need: extensive multimedia and study centres, good IT facilities, canteens, and places to relax with your fellow students. Both campuses are also within easy distance of train stations and sports facilities. We currently boast 2.100 international student enrolments from over 70 different countries!

### Studying in the Netherlands

HAN University of Applied Sciences is situated in the eastern part of the Netherlands. It is just a few kilometres from the German border, but also within easy distance of Amsterdam, London, Paris, Brussels and Berlin. The Netherlands is truly in the heart of Europe! The country is known for its cultural diversity and relaxed cosmopolitan lifestyle. You can easily observe this on a sunny day while sitting at any one of the little outdoor cafés with your friends.

### Nijmegen

Nijmegen is the oldest town in the Netherlands. It is a beautiful old university city surrounded by woodlands, castles and polders. Nijmegen has just everything a student could wish for: museums, theatres, lively cafés, excellent sports facilities and a buzzing nightlife.

### Arnhem

As the capital of the Gelderland province, Arnhem enjoys a rich and eventful history. Arnhem is located at the very centre of the Gelderland province, sprouting up out of lovely green surroundings with the Veluwe national park on one side and a lush floodplain area on the other. The city of Arnhem offers a variety of eye-catching attractions. From fashion to history, museums to pubs, and concert halls

to nightclubs.

### Ready to study in the Netherlands?

Being well prepared is the first step towards an enjoyable student life. If you come to the Netherlands as an international student, you will need to arrange a number of things before you leave, such as accommodation, a student grant and insurance. HAN is happy to assist you with the arrangements. Please visit our website for more information: [www.han.nl/english](http://www.han.nl/english)



For an overview of all the exchange courses offered by the HAN, visit:

[www.han.nl/exchangecourses](http://www.han.nl/exchangecourses)

## Exchange Courses offered by HAN University of Applied Sciences

### Advanced Mobility Implementing High-Tech Mobility Solutions<sup>1</sup>

The main aim of Advanced Mobility Implementing High-Tech Mobility Solutions is to develop skills to implement innovative techniques and make mobility more efficient and durable. The techniques you learn focus on high-tech systems that enable interaction between vehicles, drivers and their surroundings.

### Module Advanced Vehicle Dynamics and Module Systems Modelling<sup>1</sup>

These modules are part of HAN's Masters course in Automotive Systems. The Advanced Vehicle Dynamics module covers modelling and validating linear and nonlinear vehicle behaviour, with an emphasis on: Tyres, driver, passenger cars, articulated vehicles and motorcycles. The Systems Modelling module covers the following tasks: Analysing physical systems in the mechanical, electrical and energetic domains, evaluating relevant literature on modelling systems, Validating established models for physical systems and creating a report and a presentation on literature survey, modelling, model analysis and model validation in the engineering domain.

### Automotive Dynamics and Testing<sup>2</sup>

Automotive Dynamics and Testing is for students interested in engineering the future of vehicles. The course allows you to boost your dynamics and testing skills. You get all the training you need to develop new cars, with parts that are fully tested and prepared for production.

### Automotive Development and Engineering<sup>2</sup>

The Automotive Development and Engineering course provides in-depth training for the computer-aided design of automotive systems. You search for creative solutions that combine mobility requirements with sustainable, social and technical developments.

## Automotive Electronic Systems (Autotronics)<sup>1</sup>

Autotronics looks at how we control some of the most modern techniques in vehicles. You learn to improve these techniques so future generations will be able to travel safely. This comprehensive exchange course acquaints you with the many different aspects of autotronics and gives you the chance to develop a mechatronics system for vehicles.

## Module Controller Design and Module Intelligent Mobility (level Master)<sup>2</sup>

These modules are part of HAN's Masters course in Automotive Systems. The Controller Design module concerns: Analysing an uncontrolled system, creating a feedback controller, applying an advanced control strategy, applying a controlled system. The Intelligent Mobility module includes the topics: Tracking control, automated vehicle guidance, ADA systems, local area and global area mobile communication, lane departure warning systems, intelligent logistics and chain management, special examples of automated guided vehicles, cyber cars and people movers, object recognition (e.g. traffic signs, passing pedestrians) and classification, collision warning and avoidance.

## Internal Combustion Engines<sup>2</sup>

The specialty Internal Combustion Engines makes you familiar with the factors that influence engine performance and how to measure those in an engine test cell. You will be continuously challenged to come up with new ideas. Company visits in the Netherlands and abroad, as well as an assignment from industry will bring you in contact with the professional world. Together with other students you work on different assignments and projects. You learn about the combustion process, turbo's, and exhaust gas aftertreatment systems. Also data processing of measurement results, and modelling by computer simulations are included in this Minor.

## Light Weight Structural Vehicle Design<sup>1</sup>

The exchange course in Light Weight Structural Vehicle Design covers the skills and knowledge you need to become a successful engineer in lightweight construction. You learn how to run calculations and simulations to produce reliable payload and durability predictions for the design of lighter automotive constructions.

## Master Thesis<sup>1,2</sup>

Are you a Masters student looking for an interesting thesis project? Join one of the research projects conducted by the HAN Automotive

Institute in collaboration with industrial partners. Topics include: Future powertrain, Smart mobility, Optimizing fuels, engines and emissions, Lightweight automotive design and advanced driver support. We offer you our facilities and individual support and your home university takes care of the assessment, final report and presentation of the research results.

## Participating in a Research Project 'Si hca chj Y'<sup>1,2</sup>

Are you a Bachelors student looking for an interesting thesis project? Join one of the research projects conducted by the HAN Automotive Institute in collaboration with industrial partners. Topics include: Future powertrain, smart mobility, optimising fuels, engines and emissions, lightweight automotive design and advanced driver support. We offer you our facilities and individual support and your home university takes care of the assessment, final report and presentation of the research results.

## Powertrain<sup>1</sup>

In the Powertrain course you explore the design and workings of the mobile powertrain. The focus is on describing the load process in an analytical manner and, based on this analysis, selecting, modelling and dimensioning a suitable energy source and powertrain.

## GAME<sup>1,2</sup>

The international GAME semester course introduces you to the world of advanced games for personal computers and game stations. The central course covers game design techniques including level and world design, player motivation and game systems. Part of the course is offered specially for design students and covers subjects such as 3D art, graphic design, storytelling and drawing. Another part is aimed at IT students and covers subjects such as maths and physics, AI and simulation and behaviour programming in C++.

## Information System Engineering<sup>2</sup>

The Information System Engineering semester introduces you to the world of information systems. It covers the design and implementation of the database server component of a system and looks at the development of basic, form-based data management applications.

## Serious Gaming<sup>1</sup>

The Serious Gaming exchange course focuses on games and gamification for purposes other than entertainment. You learn how games can be used to solve communication problems, train staff, influence behaviour and create new forms of education. You also discover how games can teach us about engagement and

understanding systems and the visualisation of technologies.

## Biotechnology<sup>1</sup>

The Biotechnology exchange course is offered through the HAN BioCentre, which is a contract research centre in the field of industrial microbiology. During this exchange course you will contribute to this research by reading the relevant literature, discussing the latest insights with experts, and analysing your own experiments. You will learn the theory of fermentation technology, downstream processing and enzyme kinetics, biobased economy and analytical chemistry.

## Interaction between human, plant and micro-organism<sup>2</sup>

A variety of interactions take place between humans, plants and microorganism. During this exchange course you will explore these different interactions by delving into the fields of plant biology, human biology, microbiology and immunology. Important topics will be infectious diseases and antibiotic resistance, the innate and acquired immune system and the plant response to internal and external signals.

## Molecular and Biochemical Research<sup>1</sup>

An important aspect in the life sciences is identifying key genes and then making corresponding (recombinant) proteins. Before such proteins can be produced, the associated gene must first be mapped. During this exchange course you will explore the related theory in biochemistry, cell biology, molecular biology and associated bioinformatics, as well as molecular and biochemical techniques.

## Biomedical Research<sup>1,2</sup>

Cancer cells proliferate independently of growth regulatory signals in their immediate environment. This leads to a space-occupying lesion associated with pathophysiological consequences. In this exchange course you will study the pathogenesis of tumour formation (especially skin cancers) by means of two research models. The first will involve participation in the research of Dr A. Zijlstra from the Department of Pathology and Cancer Biology (Vanderbilt University Nashville). The second research model is that of Dr A. Woollard of the Department of Biochemistry (University of Oxford).

### **Molecular Plant Biotechnology<sup>1,2</sup>**

Plants are invaluable; they give us food, oxygen, building materials, clothing and fuel. With the advent of genomics and molecular biology, in the last 10 years it has become possible to study important processes in plants and to further improve crops to ensure sufficient food for everyone in the future. These new crops are badly needed as our food sources are threatened due to reduction of agricultural land, climate change and increased plant diseases that destroy harvests. To meet this challenge, we will research the nutritional value of different crops by determining the presence of special secondary metabolites. We focus on the group of carotenoids which have an important effect as an anti-oxidant and pro-vitamin A. In addition, we will study the growth and development of plants under different stress conditions in a self-designed experiment.

### **Electronics: Design, signals and systems<sup>1</sup>**

This exchange course consists of several subjects and a project. The subjects include controller design, modelling, interface electronics, EMC and communication systems. The project (15 credits) is related to control systems. To design, implement and test a control system, a mathematical description of the system is needed. You will use different sensors to convert physical quantities into electrical signals. These signals will be interfaced to the controller. You will use various simulation and design software packages to simulate the

### **Embedded: Embedded Systems Design<sup>2</sup>**

This exchange course comprises a project (15 credits) and various subjects. For the project, you will use object-oriented system analysis and system design. You will learn UML (Unified Modeling Language) and the C++ programming language. You will draw up the accompanying UML diagrams and use C++ programming language for the implementation. One of the subjects during the course will be Operating systems, covering topics such as parallel processes/threads, inter task communication and systems calls, using Linux for the application. The course also covers

Electronic Design Automation (EDA), in which design testability will play an important role. The hardware description language VHDL will serve as your starting point to design, make testable and apply various digital switches in an FPGA (Field Programmable Gate Array).

### **Embedded Vision Design<sup>1</sup>**

The aim in the Embedded Vision Design exchange course is to learn to extract information from camera images and to develop the embedded hardware and software solutions needed for this. You work with image recognition and image processing techniques and discover the ins and outs of algorithms.

### **Power Systems: Generation, Distribution and Conversion<sup>2</sup>**

The Power exchange course deals with the generation, distribution and conversion of electrical power. You will be introduced to the fundamentals of electric machinery, power conversion and electrical grid calculations. The semester is structured in theory lectures, lab classes and a project (15 credits). Theory topics include synchronous and asynchronous machines, brushless DC, electronic choppers and converters, practical digital control, as well as short-circuit current calculations. Besides the lab exercises on electro mechanics, you will work in a multidisciplinary project team on the development and automation of an electrical power conversion system.

### **Dutch Architecture<sup>1</sup>**

The Dutch Architecture exchange course introduces you to the history of Dutch Architecture and how it found its way into the world. You visit the highlights and get a hands-on, inside-out experience on the spot. You also discover design tools and learn to use them. Look into the future!

### **Smart Healthy Environments<sup>1,2</sup>**

This course will provide you with the tools and knowledge needed to contribute to promoting people's health, well-being and self-reliance in society. You will work on an assignment using a multidisciplinary, research-oriented approach. You will also learn to think critically and to design clever solutions.

### **Sustainable River Management<sup>1,2</sup>**

In the Sustainable River Management exchange course you spend a semester conducting research for the Research Group for Sustainable River Management. You study how river deltas can be made safe and attractive for people, companies and nature both now and in the future. Special attention is paid to nature-based approaches, adaptive delta management, asset management and multi-layer safety.

### **Wind Energy Project Management<sup>6</sup>**

The exchange course in Wind Energy Project Management introduces you to consultancy work in the professional field of wind energy. HAN and Out-Smart have collaborated with the professional wind energy industry to create this course that will enable you to find success in the wind energy market. So energise the new decade!

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