S4 – Project : Making your first step as specialist in a team

General information OWE / course	
Degree programme	Automotive Engineering
Semester	S4
Course Code (OSIRIS)	PROMAY04
Academic year	2025
Name Course short Dutch	AUM S4 Project
Name Course long Dutch	Project: Making your first step as specialist in a team
Name Course short English	AUM S4 Project
Name Course long English	Project: Making your first step as specialist in a team
Coordinating unit	AEA
Course type	OWE
Credits	10
Degree	B (post propaedeutic bachelor)
Grading scale course grades	Whole (without decimal)
Language of communication	English
Study load in hours	280
Instructional modes	OW (Education)
Starting term education	P3A
Duration of education	Semester
Compensation options	Not applicable
Entry requirements course	Not applicable.
General discription	In this unit of study the student can choose from several rojects. Each project requires expertise in different specialisations. The project team will be multidisciplinary and each team member will give input related to their individual expertise. This expertise is in line with the specialisations for which the student chose their units of study in semester 4. To develop research skills, the student has to perform a study based on multiple sources. Before the start of this semester, the projects will be presented that the student can apply for. The project the student applies for must relate to the specialisations the student chose for that semester.
Mandatory participation	No
Examination	
Exam number in OSIRIS	**TOETS-01**
Fulltime/Parttime	Fulltime
Description (Dutch)	Project management plan, project requirements
Description (English)	Project management plan, project requirements
Format (modular)exam	PROD (Professional) product
Weight factor of (modular) exam	1
Minimum result	5,5
Grading scale	Decimal
Exam sittings	YEARA
Written exam type	Not applicable
Assessment criteria (OWE)/Learning outcomes (EVL)	- Project management and using technical skills are important to run a project. - The students grade is based on technical products, like a

	project plan with project requirements. - For the project, the student must write a report of a research on multiple sources. - The topic is related to the project assignment.
Educational activities offered	Not applicable
Exam number in OSIRIS	**TOETS-02**
Fulltime/Parttime	Fulltime
Description (Dutch)	Research report
Description (English)	Research report
Format (modular)exam	PROD (Professional) product
Weight factor of (modular) exam	1
Minimum result	5,5
Grading scale	Decimal
Exam sittings	YEARA
Written exam type	Not applicable
Assessment criteria (OWE)/Learning outcomes (EVL)	- At the end of the project, the student must deliver professional products, and give a presentation about the project. - Personal reflection and peer feedback on the performance are important for personal competence development. - Individual research report based on (mainly) deskresearch by using different kind of sources (literature, trade journals and graduation reports, laws and regulations from internal organizations, information from institutes like TNO, databases from branch organizations, blogs from experts, etc).
Educational activities offered	Not applicable
Exam number in OSIRIS	**TOETS-03**
Fulltime/Parttime	Fulltime
Description (Dutch)	Professional Performance
Description (English)	Professional Performance
Format (modular)exam	PROD (Professional) product
Weight factor of (modular) exam	3
Minimum result	5,5
Grading scale	Decimal
Exam sittings	YEARA
Written exam type	Not applicable
Assessment criteria (OWE)/Learning outcomes (EVL)	Exam matrix as presented on OnderwijsOnline. Project products individualised by presentation, peer feedback and personal reflection.
Educational activities offered	Not applicable

S4 - MEB - Build My Company 2

General information OWE / course	
Degree programme	Automotive Engineering
Semester	S4
Course Code (OSIRIS)	BUIMYC15
Academic year	2025
Name Course short Dutch	AUM S4 MEB Build My Company 2
Name Course long Dutch	Build My Company 2
Name Course short English	AUM S4 MEB Build My Company 2
Name Course long English	AUM S4 MEB Build My Company 2
Coordinating unit	AEA
Course type	OWE
Credits	5
Degree	B (post propaedeutic bachelor)
Grading scale course grades	Whole (without decimal)
Language of communication	English
Study load in hours	140
Instructional modes	OW (Education)
Starting term education	P3A
Duration of education	Term
Compensation options	Not applicable
Entry requirements course	Not applicable.
General discription	In this unit of study, you: 1. learn how to contribute to the development of an automotive company*. 2. find out what you would like be as a manager or an entrepreneur in an organization and you will gain insight into leadership, change management, financial control and general- and financial management options. * An automotive company is an organization within the automotive industry with a relevant size and a real outlook on working in an international setting.
Mandatory participation	No
Examination	
Exam number in OSIRIS	**TOETS-01**
Fulltime/Parttime	Fulltime
Description (Dutch)	Build my Company 2
Description (English)	Build my Company 2
Format (modular)exam	PROD (Professional) product
Weight factor of (modular) exam	1
Minimum result	5,5
Grading scale	Decimal
Exam sittings	YEARA
Written exam type	Not applicable
Assessment criteria (OWE)/Learning outcomes (EVL)	For an automotive organization, the student can: • define and argue what leadership style fits him/her best and how this can be used in management of change. • establish the investment demands of a project and select the most financially profitable project based on

	several selection principles; • calculate an integral cost price based on several indirect cost calculating methods; • explain how a company can be financed; • Interpretate financial statements, e.g. balance sheet and profit and loss statement • calculate financial ratios using a simple balance and profits and losses statement.
Educational activities offered	Not applicable

S4 - MEB - Energy in Strategic Mobility

General information OWE / course	
Degree programme	Automotive Engineering
Semester	S4
Course Code (OSIRIS)	ENSMOB01
Academic year	2025
Name Course short Dutch	AUM S4 MEB ESM
Name Course long Dutch	Energy in Strategic Mobility
Name Course short English	AUM S4 MEB ESM
Name Course long English	Energy in Strategic Mobility
Coordinating unit	AEA
Course type	OWE
Credits	10
Degree	B (post propaedeutic bachelor)
Grading scale course grades	Whole (without decimal)
Language of communication	English
Study load in hours	280
Instructional modes	OW (Education)
Starting term education	P4A
Duration of education	Term
Compensation options	Not applicable
Entry requirements course	Not applicable.
General discription	In this study module, you will learn, from the business perspective: - how an automotive company* operates in the areas of strategy, risks, data, finances, mobility, and management; - analyzing the needs of an automotive company (current status, strategic development, and selection) and advising management on decisions for the future. In this study module, from the Powertrain perspective, you will learn: How to manage the power and energy used by a company fleet, including strategic charging (how much energy and power, where to source the energy, at what time, etc.). In the second part, we explore alternative fuels, last-mile delivery, and LEV, related to the task of broadening students' perspectives on mobility. *An automotive company is an organization within the automotive industry with significant scale and a realistic outlook, operating in an international setting.
Mandatory participation	No
Examination	
Exam number in OSIRIS	**TOETS-01**
Fulltime/Parttime	Fulltime
Description (Dutch)	Energy in Strategic Mobility
Description (English)	Energy in Strategic Mobility
Format (modular)exam	PROD (Professional) product
Weight factor of (modular) exam	1
Minimum result	5,5

Grading scale	Decimal
Exam sittings	YEARA
Written exam type	Not applicable
Assessment criteria (OWE)/Learning outcomes (EVL)	The student is able to apply knowledge of: - Data, Information and Datamanagement - Big Data - Data in Automotive processes - ADAS/ADS The student is able to apply knowledge of: - How and when to charge - How much energy is needed - When is the energy needed, and at which power? - Give advice to solve the difference in green energy and demand of energy from use-case The student is able to apply knowledge of: - Last mile delivery - LEV (Light Electric Vehicles) - Alternative fuels - Foodchain & fuels - Fuel Blending (dual fuel) - Risks of fuels For an automotive organization, the student can: Analyze a strategic request from an organization with regard to new mobility demands, risks, quality, finance, organization and technology; Advice on the strategic request from an organization with regard to new mobility demands, risks, quality, finance, organization and technology; For an automotive organization, the student can: - give a strategic advice presentation, based on analysis and research and substantiate with the proposed choices.
Educational activities offered	Not applicable

S4 - MEB - Sustainable Mobility Selection

General information OWE / course	
Degree programme	Automotive Engineering
Semester	S4
Course Code (OSIRIS)	SUMOSE01
Academic year	2025
Name Course short Dutch	AUM S4 MEB SMS
Name Course long Dutch	Sustainable Mobility Selection
Name Course short English	AUM S4 MEB SMS
Name Course long English	Sustainable Mobility Selection
Coordinating unit	AEA
Course type	OWE
Credits	5
Degree	B (post propaedeutic bachelor)
Grading scale course grades	Whole (without decimal)
Language of communication	English
Study load in hours	140
Instructional modes	OW (Education)
Starting term education	P3A
Duration of education	Term
Compensation options	Not applicable
Entry requirements course	This module covers various powertrain options to be able to perform a mobility selection, taking into account the ethics and the environmental aspects surrounding this choice.
General discription	Sustainable Mobility Selection includes a couple of subjects that focus on different powertrain options. Aiming at a selection of mobility solutions and taking ethical and environmental aspects into account.
Mandatory participation	No
Examination	
Exam number in OSIRIS	**TOETS-01**
Fulltime/Parttime	Fulltime
Description (Dutch)	Environmental Awareness and choosing the powertrain
Description (English)	Environmental Awareness and choosing the powertrain
Format (modular)exam	PROD (Professional) product
Weight factor of (modular) exam	1
Minimum result	5,5
Grading scale	Decimal
Exam sittings	YEARA
Written exam type	Not applicable
Assessment criteria (OWE)/Learning outcomes (EVL)	The student is able to make a mobility selection with respect to: - Well-to-wheel - LCA - Power and energy requirements from the company (considering distribution centers) - Charging and infrastructure (Grid issues) - Environmental impact - After Treatment The student can:

	- set up a loadcycle - do marketresearch on power train possibilities (for example H2, EV, ICE) - build a power train model and use substantiated parameters - the model gives information about energy consumption & costs
Educational activities offered	Not applicable

S4 - VDT - Designing Vehicle Structures

General information OWE / course	
Degree programme	Automotive Engineering
Semester	S4
Course Code (OSIRIS)	DESVES07
Academic year	2025
Name Course short Dutch	AUM S4 VDT Designing Vehicle Structures
Name Course long Dutch	Designing Vehicle Structures
Name Course short English	AUM S4 VDT Designing Vehicle Structures
Name Course long English	Designing Vehicle Structures
Coordinating unit	AEA
Course type	OWE
Credits	7,5
Degree	B (post propaedeutic bachelor)
Grading scale course grades	Whole (without decimal)
Language of communication	English
Study load in hours	210
Instructional modes	OW (Education)
Starting term education	P3A
Duration of education	Semester
Compensation options	Not applicable
Entry requirements course	Not applicable.
General discription	In this unit of study, you learn how to design and model a frame or chassis. This begins with a short theoretical foundation. The next step is to determine the load on the chassis. With this load, an initial sizing of the chassis/frame can be made. Once you have the initial sizing, you can determine the deformation and the stresses of the chassis. All this is done by using hand calculations and finite element software (Solidworks Simulation & PC frame). You will learn how to create a finite element model of a vehicle. The hand calculations are used to initially size the construction and validate the outcome of the finite element software. This is done because mistakes are often made when using finite element software. The knowledge in this module is essential for designing vehicles as an automotive engineer.
Mandatory participation	No
Examination	
Exam number in OSIRIS	**TOETS-01**
Fulltime/Parttime	Fulltime
Description (Dutch)	Designing Vehicle Structures 1
Description (English)	Designing Vehicle Structures 1
Format (modular)exam	KENN Knowledge exam
Weight factor of (modular) exam	1
Minimum result	5,5
Grading scale	Decimal
Exam sittings	P3A (1x) P4A (1x)
Written exam type	Computerlokaal met externe software/computer classroom with external software

Assessment criteria (OWE)/Learning outcomes (EVL)	A student can: - determine the load on a simplified chassis/frame with a hand calculation and with finite element modelling*, based on a given load case. With this load, the student is also able to size the chassis/frame based on a given material and maximum stress limit; - calculate the deformation of a simplified chassis/frame with both hand calculations and finite element modelling*; - create a finite element model* and justify the choices in the set-up and simplification of the model and compare the outcome of the model with hand calculations. *Finite element models may contain different elements, supports, singularities, connectors and possible contact.
Educational activities offered	Not applicable
Exam number in OSIRIS	**TOETS-02**
Fulltime/Parttime	Fulltime
Description (Dutch)	Designing Vehicle Structures 2
Description (English)	Designing Vehicle Structures 2
Format (modular)exam	PROD (Professional) product
Weight factor of (modular) exam	1
Minimum result	5,5
Grading scale	Decimal
Exam sittings	YEARA
Written exam type	Not applicable
Assessment criteria (OWE)/Learning outcomes (EVL)	A student can: - determine the load on a chassis/frame with a hand calculation and with finite element modelling*, based on a given load case. - calculate the deformation or stresses of a chassis/frame with both hand calculations and finite element modelling*; - create a finite element model* and justify the choices in the set-up and simplification of the model and compare the outcome of the model with measurements or hand calculations. *Finite element models may contain different elements, supports, singularities, connectors and possible contact.
Educational activities offered	Not applicable

S4 - VDT - Manufacturing Technology 1

General information OWE / course	
Degree programme	Automotive Engineering
Semester	S4
Course Code (OSIRIS)	MANUTE09
Academic year	2025
Name Course short Dutch	AUM S4 VDT Manufacturing Technology 1
Name Course long Dutch	Manufacturing Technology 1
Name Course short English	AUM S4 VDT Manufacturing Technology 1
Name Course long English	Manufacturing Technology 1
Coordinating unit	AEA
Course type	OWE
Credits	2,5
Degree	B (post propaedeutic bachelor)
Grading scale course grades	Whole (without decimal)
Language of communication	English
Study load in hours	70
Instructional modes	OW (Education)
Starting term education	P3A
Duration of education	Term
Compensation options	Not applicable
Entry requirements course	Not applicable.
General discription	In this unit of study, you learn various production techniques and methods of optimising your automotive design for production. You apply your knowledge of physics (mechanics, electricity and materials science), design (requirements and quality) and business management (batch size, costs and prices). The unit of study covers the following production techniques: processes for shapeless materials (excl. additive manufacturing), forming, dividing, machining, joining, and production machines and automation.
Mandatory participation	No
Examination	
Exam number in OSIRIS	**TOETS-01**
Fulltime/Parttime	Fulltime
Description (Dutch)	Manufacturing Technology 1
Description (English)	Manufacturing Technology 1
Format (modular)exam	KENN Knowledge exam
Weight factor of (modular) exam	1
Minimum result	5,5
Grading scale	Decimal
Exam sittings	P3A (1x) P4A (1x)
Written exam type	ANS written
Assessment criteria (OWE)/Learning outcomes (EVL)	The student: - recognises and describes different production techniques; - points out and explains the correct terms and concepts for different production techniques; - differentiates between different production

	techniques.makes calculations to substantiate technical decisions (e.g. required power); - chooses an optimal production technique, in relation to an automotive design, material and various business aspects.
Educational activities offered	Not applicable

S4 - VDT - Manufacturing Technology 2

General information OWE / course	
Degree programme	Automotive Engineering
Semester	S4
Course Code (OSIRIS)	MANUTE10
Academic year	2025
Name Course short Dutch	AUM S4 VDT Manufacturing Technology 2
Name Course long Dutch	Manufacturing Technology 2
Name Course short English	AUM S4 VDT Manufacturing Technology 2
Name Course long English	Manufacturing Technology 2
Coordinating unit	AEA
Course type	OWE
Credits	2,5
Degree	B (post propaedeutic bachelor)
Grading scale course grades	Whole (without decimal)
Language of communication	English
Study load in hours	70
Instructional modes	OW (Education)
Starting term education	P4A
Duration of education	Term
Compensation options	Not appicable
Entry requirements course	It's important that the student meet the following guidelines so they can work as required: - Complete the Manufacturing Technology 1 unit of study.
General discription	The unit of study is an extension of the Manufacturing Technology 1 unit of study. In addition to the learning outcomes from that unit of study, you work on a specified case for an automotive product. You choose a suitable production technique and material for that product, create a production drawing, set up a production plan.
Mandatory participation	Workshop Geometrical Tolerances
Examination	
Exam number in OSIRIS	**TOETS-01**
Fulltime/Parttime	Fulltime
Description (Dutch)	Manufacturing Technology 2
Description (English)	Manufacturing Technology 2
Format (modular)exam	PORT Portfolio
Weight factor of (modular) exam	1
Minimum result	5,5
Grading scale	Decimal
Exam sittings	YEARA
Written exam type	Not applicable
Assessment criteria (OWE)/Learning outcomes (EVL)	For a specified product related to a complex automotive design, the student: - explores alternative options that consider design, material & manufacturing aspects. - creates a production drawing. - specifies geometrical tolerances on a production drawing. - creates a production plan. Participation in the workshop on geometrical tolerances is mandatory.

Educational activities offered	Not applicable

S4 - VDT - Modeling the suspension

General information OWE / course	
Degree programme	Automotive Engineering
Semester	S4
Course Code (OSIRIS)	MODTHS03
Academic year	2025
Name Course short Dutch	AUM S4 VDT Modeling the suspension
Name Course long Dutch	Modeling the suspension
Name Course short English	AUM S4 VDT Modeling the suspension
Name Course long English	Modeling the suspension
Coordinating unit	AEA
Course type	OWE
Credits	2,5
Degree	B (post propaedeutic bachelor)
Grading scale course grades	Whole (without decimal)
Language of communication	English
Study load in hours	70
Instructional modes	OW (Education)
Starting term education	P3A
Duration of education	Term
Compensation options	Not applicable
Entry requirements course	Not applicable.
General discription	This unit of study covers the modelling of a vehicle considering the suspension. It addresses the influences of the vehicle suspension system and its components on the vehicle dynamics and road holding.
Mandatory participation	No
Examination	
Exam number in OSIRIS	**TOETS-01**
Fulltime/Parttime	Fulltime
Description (Dutch)	Modeling the suspension
Description (English)	Modeling the suspension
Format (modular)exam	PORT Portfolio
Weight factor of (modular) exam	1
Minimum result	5,5
Grading scale	Decimal
Exam sittings	YEARA
Written exam type	Not applicable
Assessment criteria (OWE)/Learning outcomes (EVL)	The student is able to: - define vertical comfort, loads and road holding of a vehicle; - build a suspension model in a design tool (e.g. Solidworks / Matlab Simulink / Simscape Multibody / Simmechanics) in order to support the analyses in UoS 'Suspension dynamics and road holding'; - build a mathematical suspension model (based on differential equations) focused on the research of the vertical road holding and comfort;perform parameter studies to investigate the dynamic behavior of the suspension with the specified models;

Educational activities offered	Not applicable

S4 - VDT - Suspension dynamics and road holding

General information OWE / course	
Degree programme	Automotive Engineering
Semester	S4
Course Code (OSIRIS)	SUSDYR08
Academic year	2025
Name Course short Dutch	AUM S4 VDT Suspension dynamics
Name Course long Dutch	Suspension dynamics and road holding
Name Course short English	AUM S4 VDT Suspension dynamics
Name Course long English	Suspension dynamics and road holding
Coordinating unit	AEA
Course type	OWE
Credits	2,5
Degree	B (post propaedeutic bachelor)
Grading scale course grades	Whole (without decimal)
Language of communication	English
Study load in hours	70
Instructional modes	OW (Education)
Starting term education	P3A
Duration of education	Term
Compensation options	Not applicable
Entry requirements course	Not applicable.
General discription	This study unit covers the dynamics of a vehicle considering the suspension. The influences of the vehicle suspension system and its components on the vehicle dynamics and road holding are covered, including for example: camber, caster, roll center, over/understeer, stabilizer rod, anti-dive anti-squat. During the module, the student makes an analyses of his own chosen vehicle suspension and supports this with a model.
Mandatory participation	No
Examination	
Exam number in OSIRIS	**TOETS-01**
Fulltime/Parttime	Fulltime
Description (Dutch)	Suspension dynamics and road holding
Description (English)	Suspension dynamics and road holding
Format (modular)exam	PORT Portfolio
Weight factor of (modular) exam	1
Minimum result	5,5
Grading scale	Decimal
Exam sittings	YEARA
Written exam type	Not applicable
Assessment criteria (OWE)/Learning outcomes (EVL)	The student is able to: - determine design aspects of the suspension (e.g. roll center, anti dive/anti squat, roll stiffness) which influences the vehicle

	dynamics (e.g. kinematics and elasto-kinematics, roll/dive/squat) and road holding (e.g. roll steer, over steer/ nder steer) of the vehicle; - analyze how these design aspects influence the vehicle dynamics and road holding of the vehicle; - analyze an existing suspension (e.g. students own vehicle) on the design aspects and relate it to vehicle dynamics and road holding; - support the analyses of an existing suspension with a model of that suspension.
Educational activities offered	Not applicable

S4 - VDT - Testing the vehicle

General information OWE / course	
Degree programme	Automotive Engineering
Semester	S4
Course Code (OSIRIS)	TESTHV03
Academic year	2025
Name Course short Dutch	AUM S4 VDT Testing the vehicle
Name Course long Dutch	Testing the vehicle
Name Course short English	AUM S4 VDT Testing the vehicle
Name Course long English	Testing the vehicle
Coordinating unit	AEA
Course type	OWE
Credits	2,5
Degree	B (post propaedeutic bachelor)
Grading scale course grades	Whole (without decimal)
Language of communication	English
Study load in hours	70
Instructional modes	OW (Education)
Starting term education	P4A
Duration of education	Term
Compensation options	Not applicable
Entry requirements course	Not applicable.
General discription	Assessment of vehicle performance is an important phase in the V-cycle in a vehicle's development process. The specifications are validated with measurements and data analysis. In this unit of study, the student will learn how to judge a vehicle by performing vehicle tests and analysing measured data.
Mandatory participation	No
Examination	
Exam number in OSIRIS	**TOETS-01**
Fulltime/Parttime	Fulltime
Description (Dutch)	Testing the vehicle
Description (English)	Testing the vehicle
Format (modular)exam	PORT Portfolio
Weight factor of (modular) exam	1
Minimum result	5,5
Grading scale	Decimal
Exam sittings	YEARA
Written exam type	Not applicable
Assessment criteria (OWE)/Learning outcomes (EVL)	The student can: - perform a vehicle test in a reproducible way; acquire data with software, choose an appropriate filter for the data and process the data; - analyse the specifications of the vehicle by means of the processed data; - present the results of the analysis; - based on the knowledge and skills gained in this unit of study, the student writes a test report. All the information

	needed for this test report is stored in a portfolio that is graded.
Educational activities offered	Not applicable

S4 - VSC - Challenge autonomous driving

General information OWE / course	
Degree programme	Automotive Engineering
Semester	S4
Course Code (OSIRIS)	CHAAUD03
Academic year	2025
Name Course short Dutch	AUM S4 VSC Challenge autonomous driving
Name Course long Dutch	Challenge autonomous driving
Name Course short English	AUM S4 VSC Challenge autonomous driving
Name Course long English	Challenge autonomous driving
Coordinating unit	AEA
Course type	OWE
Credits	5
Degree	B (post propaedeutic bachelor)
Grading scale course grades	Whole (without decimal)
Language of communication	English
Study load in hours	140
Instructional modes	OW (Education)
Starting term education	P4A
Duration of education	Term
Compensation options	Not applicable
Entry requirements course	Not applicable.
General discription	In this unit of study, you design a self-driven vehicle that can autonomously drive a predefined route, find a free parking spot and park the vehicle in that spot. To do this, you select appropriate sensor systems, write software and carry out a lot of testing. Based on given system specifications, you learn how to build sensor systems, read and process their signals so you can use them to control the system actuators. The educational format used in this unit of study is a challenge.
Mandatory participation	No
Examination	
Exam number in OSIRIS	**TOETS-01**
Fulltime/Parttime	Fulltime
Description (Dutch)	Challenge autonomous driving
Description (English)	Challenge autonomous driving
Format (modular)exam	PROD (Professional) product
Weight factor of (modular) exam	1
Minimum result	5,5
Grading scale	Decimal
Exam sittings	YEARA
Written exam type	Not applicable
Assessment criteria (OWE)/Learning outcomes (EVL)	The student can: - the student can substantiate related choices: develop a properly structured and documented algorithm in a model-based way.

	- design and test sensor electronics for ADAS systems (e.g. object detection and lane-keeping); - design and implement ECU software for ADAS systems; - design, test and validate vehicle models and apply these models in a model-based design process; - write a technical design report.
Educational activities offered	Not applicable

S4 - VSC - Designing Electric Driveline

General information OWE / course	
Degree programme	Automotive Engineering
Semester	S4
Course Code (OSIRIS)	DESTHE04
Academic year	2025
Name Course short Dutch	AUM S4 VSC Designing Electric Driveline
Name Course long Dutch	Designing the Electric Driveline
Name Course short English	AUM S4 VSC Designing Electric Driveline
Name Course long English	Designing the Electric Driveline
Coordinating unit	AEA
Course type	OWE
Credits	2,5
Degree	B (post propaedeutic bachelor)
Grading scale course grades	Whole (without decimal)
Language of communication	English
Study load in hours	70
Instructional modes	OW (Education)
Starting term education	P4A
Duration of education	Term
Compensation options	Not applicable
Entry requirements course	Not applicable.
General discription	HAN Automotive Engineering considers the powertrain system approach from load (energy demand), transition (energy conversion) and (energy) source. The unit of study Designing the Electric Driveline focuses on the powertrains for electric (EV) and hybrid (HEV) vehicles. In this unit of study the student learns to design the driveline for EV and HEV, from system level to basic machine design, and to test, model and control specific system parameters.
Mandatory participation	No
Examination	
Exam number in OSIRIS	**TOETS-01**
Fulltime/Parttime	Fulltime
Description (Dutch)	Understanding
Description (English)	Understanding
Format (modular)exam	KENN Knowledge exam
Weight factor of (modular) exam	1
Minimum result	5,5
Grading scale	Decimal
Exam sittings	P4A (1x) P5A (1x)
Written exam type	ANS BOYD
Assessment criteria (OWE)/Learning outcomes (EVL)	With regard to different electric and hybrid vehicles, the student can: - research systems - define a set of requirements - select architecture and design driveline systems and

	components, in line with the design philosophy and feasibility.
Educational activities offered	Not applicable
Exam number in OSIRIS	**TOETS-02**
Fulltime/Parttime	Fulltime
Description (Dutch)	Research and Model
Description (English)	Research and Model
Format (modular)exam	PROD (Professional) product
Weight factor of (modular) exam	0
Minimum result	P
Grading scale	P/F
Exam sittings	YEARA
Written exam type	Not applicable
Assessment criteria (OWE)/Learning outcomes (EVL)	With regard to different electric and hybrid vehicles, the student is can: - build a torque controlled driveline model; - perform a laboratory test to collect data; - tune the model with the aquired data; - perform parameter studies with the tuned model.
Educational activities offered	Not applicable

S4 - VSC - Introduction to ECUs and Model-Based Development

General information OWE / course	
Degree programme	Automotive Engineering
Semester	S4
Course Code (OSIRIS)	INEMOB03
Academic year	2025
Name Course short Dutch	AUM4-VSC-MBD
Name Course long Dutch	Introduction to ECUs and Model-Based Development
Name Course short English	AUM4-VSC-MBD
Name Course long English	Introduction to ECUs and Model-Based Development
Coordinating unit	AEA
Course type	OWE
Credits	5
Degree	B (post propaedeutic bachelor)
Grading scale course grades	Whole (without decimal)
Language of communication	English
Study load in hours	140
Instructional modes	OW (Education)
Starting term education	P3A
Duration of education	Term
Compensation options	Not applicable
Entry requirements course	Not applicable.
General discription	This unit of study explains how MCU's and ECU's work and how to write control software via model-based design. Electronic control units (ECU's) form the heart of all automotive systems. ECU's are control units that use sensors to measure physical data like temperature and pressure. Based on these sensors readings, ECU's control systems in the vehicle. An example is an ABS system that controls brake pressure to prevent wheel slip based on wheel speed sensors. This course explains the hardware of an ECU, among which the MCU (microcontroller unit), several sensor systems and power electronics. Software algorithms need to be developed to control the vehicle systems. You learn to use simulation techniques to do this in a model-based way, as it is done by vehicle manufacturers. Programming in this unit of study uses a graphical environment, based on MATLAB/Simulink®. You learn how to program an MCU board with Matlab/Simulink, how to visualise signals via e.g. HANtune and how model-based design can be used to simplify and test the design. On completion of the unit of study, you can structure the model, document it and maintain it using a version control system.
Mandatory participation	No
Examination	
Exam number in OSIRIS	**TOETS-01**

Fulltime/Parttime	Fulltime
Description (Dutch)	Basics of ECU and Model-Based Development
Description (English)	Basics of ECU and Model-Based Development
Format (modular)exam	KENN Knowledge exam
Weight factor of (modular) exam	1
Minimum result	5,5
Grading scale	Decimal
Exam sittings	P3A (1x) P4A (1x)
Written exam type	ANS Written
Assessment criteria (OWE)/Learning outcomes (EVL)	The student can: - make a global functional sketch of the architecture of an ECU; - explain the working of an MCU and its main features (processor, memory, timers, ADC); - explain and/or work out basic Simulink models or subsystems to implement control algorithms or to process sensor signals. - manage and maintain the source code and documentation in a version control system; - explain the most relevant model-based control system development techniques, including their advantages and disadvantages.
Educational activities offered	Not applicable
Exam number in OSIRIS	**TOETS-02**
Fulltime/Parttime	Fulltime
Description (Dutch)	Workshops ECU
Description (English)	Workshops ECU
Format (modular)exam	PROD (Professional) product
Weight factor of (modular) exam	0
Minimum result	P
Grading scale	P/F
Exam sittings	YEARA
Written exam type	Not applicable
Assessment criteria (OWE)/Learning outcomes (EVL)	The student can: - understand and write basic matlab scripts and simulink models. - measure the main characteristics of the ADC of an ECU (offset, reference voltage, accuracy); - design a simple (thermal) sensor system using the ADC of a microcontroller system; - create PWM signals with adjustable frequency and duty cycle; - use the input capture feature of a timer to measure the number of pulses and frequency of a signal; - implement control algorithms in the simulation model and/or real-time application; - create practically working subsystems by automatically generating code from the simulation model (‘RCP’: Rapid Control Prototyping) and running it on the physical prototype system (‘HIL”: Hardware-In-the-Loop);

	- validate the design and the resulting system behaviour based on given system specifications.
Educational activities offered	Not applicable

S4 – Project : Making your first step as specialist in a team

General information OWE / course	
Degree programme	Automotive Engineering
Semester	S4
Course Code (OSIRIS)	PROMAY04
Academic year	2025
Name Course short Dutch	AUM S4 Project
Name Course long Dutch	Project: Making your first step as specialist in a team
Name Course short English	AUM S4 Project
Name Course long English	Project: Making your first step as specialist in a team
Coordinating unit	AEA
Course type	OWE
Credits	10
Degree	B (post propaedeutic bachelor)
Grading scale course grades	Whole (without decimal)
Language of communication	English
Study load in hours	280
Instructional modes	OW (Education)
Starting term education	P3A
Duration of education	Semester
Compensation options	Not applicable
Entry requirements course	Not applicable.
General discription	In this unit of study the student can choose from several rojects. Each project requires expertise in different specialisations. The project team will be multidisciplinary and each team member will give input related to their individual expertise. This expertise is in line with the specialisations for which the student chose their units of study in semester 4. To develop research skills, the student has to perform a study based on multiple sources. Before the start of this semester, the projects will be presented that the student can apply for. The project the student applies for must relate to the specialisations the student chose for that semester.
Mandatory participation	No
Examination	
Exam number in OSIRIS	**TOETS-01**
Fulltime/Parttime	Fulltime
Description (Dutch)	Project management plan, project requirements
Description (English)	Project management plan, project requirements
Format (modular)exam	PROD (Professional) product
Weight factor of (modular) exam	1
Minimum result	5,5
Grading scale	Decimal
Exam sittings	YEARA
Written exam type	Not applicable
Assessment criteria (OWE)/Learning outcomes (EVL)	- Project management and using technical skills are important to run a project. - The students grade is based on technical products, like a

	project plan with project requirements. - For the project, the student must write a report of a research on multiple sources. - The topic is related to the project assignment.
Educational activities offered	Not applicable
Exam number in OSIRIS	**TOETS-02**
Fulltime/Parttime	Fulltime
Description (Dutch)	Research report
Description (English)	Research report
Format (modular)exam	PROD (Professional) product
Weight factor of (modular) exam	1
Minimum result	5,5
Grading scale	Decimal
Exam sittings	YEARA
Written exam type	Not applicable
Assessment criteria (OWE)/Learning outcomes (EVL)	- At the end of the project, the student must deliver professional products, and give a presentation about the project. - Personal reflection and peer feedback on the performance are important for personal competence development. - Individual research report based on (mainly) deskresearch by using different kind of sources (literature, trade journals and graduation reports, laws and regulations from internal organizations, information from institutes like TNO, databases from branch organizations, blogs from experts, etc).
Educational activities offered	Not applicable
Exam number in OSIRIS	**TOETS-03**
Fulltime/Parttime	Fulltime
Description (Dutch)	Professional Performance
Description (English)	Professional Performance
Format (modular)exam	PROD (Professional) product
Weight factor of (modular) exam	3
Minimum result	5,5
Grading scale	Decimal
Exam sittings	YEARA
Written exam type	Not applicable
Assessment criteria (OWE)/Learning outcomes (EVL)	Exam matrix as presented on OnderwijsOnline. Project products individualised by presentation, peer feedback and personal reflection.
Educational activities offered	Not applicable

S4 - MEB - Build My Company 2

General information OWE / course	
Degree programme	Automotive Engineering
Semester	S4
Course Code (OSIRIS)	BUIMYC15
Academic year	2025
Name Course short Dutch	AUM S4 MEB Build My Company 2
Name Course long Dutch	Build My Company 2
Name Course short English	AUM S4 MEB Build My Company 2
Name Course long English	AUM S4 MEB Build My Company 2
Coordinating unit	AEA
Course type	OWE
Credits	5
Degree	B (post propaedeutic bachelor)
Grading scale course grades	Whole (without decimal)
Language of communication	English
Study load in hours	140
Instructional modes	OW (Education)
Starting term education	P3A
Duration of education	Term
Compensation options	Not applicable
Entry requirements course	Not applicable.
General discription	In this unit of study, you: 1. learn how to contribute to the development of an automotive company*. 2. find out what you would like be as a manager or an entrepreneur in an organization and you will gain insight into leadership, change management, financial control and general- and financial management options. * An automotive company is an organization within the automotive industry with a relevant size and a real outlook on working in an international setting.
Mandatory participation	No
Examination	
Exam number in OSIRIS	**TOETS-01**
Fulltime/Parttime	Fulltime
Description (Dutch)	Build my Company 2
Description (English)	Build my Company 2
Format (modular)exam	PROD (Professional) product
Weight factor of (modular) exam	1
Minimum result	5,5
Grading scale	Decimal
Exam sittings	YEARA
Written exam type	Not applicable
Assessment criteria (OWE)/Learning outcomes (EVL)	For an automotive organization, the student can: • define and argue what leadership style fits him/her best and how this can be used in management of change. • establish the investment demands of a project and select the most financially profitable project based on

	several selection principles; • calculate an integral cost price based on several indirect cost calculating methods; • explain how a company can be financed; • Interpretate financial statements, e.g. balance sheet and profit and loss statement • calculate financial ratios using a simple balance and profits and losses statement.
Educational activities offered	Not applicable

S4 - MEB - Energy in Strategic Mobility

General information OWE / course	
Degree programme	Automotive Engineering
Semester	S4
Course Code (OSIRIS)	ENSMOB01
Academic year	2025
Name Course short Dutch	AUM S4 MEB ESM
Name Course long Dutch	Energy in Strategic Mobility
Name Course short English	AUM S4 MEB ESM
Name Course long English	Energy in Strategic Mobility
Coordinating unit	AEA
Course type	OWE
Credits	10
Degree	B (post propaedeutic bachelor)
Grading scale course grades	Whole (without decimal)
Language of communication	English
Study load in hours	280
Instructional modes	OW (Education)
Starting term education	P4A
Duration of education	Term
Compensation options	Not applicable
Entry requirements course	Not applicable.
General discription	In this study module, you will learn, from the business perspective: - how an automotive company* operates in the areas of strategy, risks, data, finances, mobility, and management; - analyzing the needs of an automotive company (current status, strategic development, and selection) and advising management on decisions for the future. In this study module, from the Powertrain perspective, you will learn: How to manage the power and energy used by a company fleet, including strategic charging (how much energy and power, where to source the energy, at what time, etc.). In the second part, we explore alternative fuels, last-mile delivery, and LEV, related to the task of broadening students' perspectives on mobility. *An automotive company is an organization within the automotive industry with significant scale and a realistic outlook, operating in an international setting.
Mandatory participation	No
Examination	
Exam number in OSIRIS	**TOETS-01**
Fulltime/Parttime	Fulltime
Description (Dutch)	Energy in Strategic Mobility
Description (English)	Energy in Strategic Mobility
Format (modular)exam	PROD (Professional) product
Weight factor of (modular) exam	1
Minimum result	5,5

Grading scale	Decimal
Exam sittings	YEARA
Written exam type	Not applicable
Assessment criteria (OWE)/Learning outcomes (EVL)	The student is able to apply knowledge of: - Data, Information and Datamanagement - Big Data - Data in Automotive processes - ADAS/ADS The student is able to apply knowledge of: - How and when to charge - How much energy is needed - When is the energy needed, and at which power? - Give advice to solve the difference in green energy and demand of energy from use-case The student is able to apply knowledge of: - Last mile delivery - LEV (Light Electric Vehicles) - Alternative fuels - Foodchain & fuels - Fuel Blending (dual fuel) - Risks of fuels For an automotive organization, the student can: Analyze a strategic request from an organization with regard to new mobility demands, risks, quality, finance, organization and technology; Advice on the strategic request from an organization with regard to new mobility demands, risks, quality, finance, organization and technology; For an automotive organization, the student can: - give a strategic advice presentation, based on analysis and research and substantiate with the proposed choices.
Educational activities offered	Not applicable

S4 - MEB - Sustainable Mobility Selection

General information OWE / course	
Degree programme	Automotive Engineering
Semester	S4
Course Code (OSIRIS)	SUMOSE01
Academic year	2025
Name Course short Dutch	AUM S4 MEB SMS
Name Course long Dutch	Sustainable Mobility Selection
Name Course short English	AUM S4 MEB SMS
Name Course long English	Sustainable Mobility Selection
Coordinating unit	AEA
Course type	OWE
Credits	5
Degree	B (post propaedeutic bachelor)
Grading scale course grades	Whole (without decimal)
Language of communication	English
Study load in hours	140
Instructional modes	OW (Education)
Starting term education	P3A
Duration of education	Term
Compensation options	Not applicable
Entry requirements course	This module covers various powertrain options to be able to perform a mobility selection, taking into account the ethics and the environmental aspects surrounding this choice.
General discription	Sustainable Mobility Selection includes a couple of subjects that focus on different powertrain options. Aiming at a selection of mobility solutions and taking ethical and environmental aspects into account.
Mandatory participation	No
Examination	
Exam number in OSIRIS	**TOETS-01**
Fulltime/Parttime	Fulltime
Description (Dutch)	Environmental Awareness and choosing the powertrain
Description (English)	Environmental Awareness and choosing the powertrain
Format (modular)exam	PROD (Professional) product
Weight factor of (modular) exam	1
Minimum result	5,5
Grading scale	Decimal
Exam sittings	YEARA
Written exam type	Not applicable
Assessment criteria (OWE)/Learning outcomes (EVL)	The student is able to make a mobility selection with respect to: - Well-to-wheel - LCA - Power and energy requirements from the company (considering distribution centers) - Charging and infrastructure (Grid issues) - Environmental impact - After Treatment The student can:

	- set up a loadcycle - do marketresearch on power train possibilities (for example H2, EV, ICE) - build a power train model and use substantiated parameters - the model gives information about energy consumption & costs
Educational activities offered	Not applicable

S4 - VDT - Designing Vehicle Structures

General information OWE / course	
Degree programme	Automotive Engineering
Semester	S4
Course Code (OSIRIS)	DESVES07
Academic year	2025
Name Course short Dutch	AUM S4 VDT Designing Vehicle Structures
Name Course long Dutch	Designing Vehicle Structures
Name Course short English	AUM S4 VDT Designing Vehicle Structures
Name Course long English	Designing Vehicle Structures
Coordinating unit	AEA
Course type	OWE
Credits	7,5
Degree	B (post propaedeutic bachelor)
Grading scale course grades	Whole (without decimal)
Language of communication	English
Study load in hours	210
Instructional modes	OW (Education)
Starting term education	P3A
Duration of education	Semester
Compensation options	Not applicable
Entry requirements course	Not applicable.
General discription	In this unit of study, you learn how to design and model a frame or chassis. This begins with a short theoretical foundation. The next step is to determine the load on the chassis. With this load, an initial sizing of the chassis/frame can be made. Once you have the initial sizing, you can determine the deformation and the stresses of the chassis. All this is done by using hand calculations and finite element software (Solidworks Simulation & PC frame). You will learn how to create a finite element model of a vehicle. The hand calculations are used to initially size the construction and validate the outcome of the finite element software. This is done because mistakes are often made when using finite element software. The knowledge in this module is essential for designing vehicles as an automotive engineer.
Mandatory participation	No
Examination	
Exam number in OSIRIS	**TOETS-01**
Fulltime/Parttime	Fulltime
Description (Dutch)	Designing Vehicle Structures 1
Description (English)	Designing Vehicle Structures 1
Format (modular)exam	KENN Knowledge exam
Weight factor of (modular) exam	1
Minimum result	5,5
Grading scale	Decimal
Exam sittings	P3A (1x) P4A (1x)
Written exam type	Computerlokaal met externe software/computer classroom with external software

Assessment criteria (OWE)/Learning outcomes (EVL)	A student can: - determine the load on a simplified chassis/frame with a hand calculation and with finite element modelling*, based on a given load case. With this load, the student is also able to size the chassis/frame based on a given material and maximum stress limit; - calculate the deformation of a simplified chassis/frame with both hand calculations and finite element modelling*; - create a finite element model* and justify the choices in the set-up and simplification of the model and compare the outcome of the model with hand calculations. *Finite element models may contain different elements, supports, singularities, connectors and possible contact.
Educational activities offered	Not applicable
Exam number in OSIRIS	**TOETS-02**
Fulltime/Parttime	Fulltime
Description (Dutch)	Designing Vehicle Structures 2
Description (English)	Designing Vehicle Structures 2
Format (modular)exam	PROD (Professional) product
Weight factor of (modular) exam	1
Minimum result	5,5
Grading scale	Decimal
Exam sittings	YEARA
Written exam type	Not applicable
Assessment criteria (OWE)/Learning outcomes (EVL)	A student can: - determine the load on a chassis/frame with a hand calculation and with finite element modelling*, based on a given load case. - calculate the deformation or stresses of a chassis/frame with both hand calculations and finite element modelling*; - create a finite element model* and justify the choices in the set-up and simplification of the model and compare the outcome of the model with measurements or hand calculations. *Finite element models may contain different elements, supports, singularities, connectors and possible contact.
Educational activities offered	Not applicable

S4 - VDT - Manufacturing Technology 1

General information OWE / course	
Degree programme	Automotive Engineering
Semester	S4
Course Code (OSIRIS)	MANUTE09
Academic year	2025
Name Course short Dutch	AUM S4 VDT Manufacturing Technology 1
Name Course long Dutch	Manufacturing Technology 1
Name Course short English	AUM S4 VDT Manufacturing Technology 1
Name Course long English	Manufacturing Technology 1
Coordinating unit	AEA
Course type	OWE
Credits	2,5
Degree	B (post propaedeutic bachelor)
Grading scale course grades	Whole (without decimal)
Language of communication	English
Study load in hours	70
Instructional modes	OW (Education)
Starting term education	P3A
Duration of education	Term
Compensation options	Not applicable
Entry requirements course	Not applicable.
General discription	In this unit of study, you learn various production techniques and methods of optimising your automotive design for production. You apply your knowledge of physics (mechanics, electricity and materials science), design (requirements and quality) and business management (batch size, costs and prices). The unit of study covers the following production techniques: processes for shapeless materials (excl. additive manufacturing), forming, dividing, machining, joining, and production machines and automation.
Mandatory participation	No
Examination	
Exam number in OSIRIS	**TOETS-01**
Fulltime/Parttime	Fulltime
Description (Dutch)	Manufacturing Technology 1
Description (English)	Manufacturing Technology 1
Format (modular)exam	KENN Knowledge exam
Weight factor of (modular) exam	1
Minimum result	5,5
Grading scale	Decimal
Exam sittings	P3A (1x) P4A (1x)
Written exam type	ANS written
Assessment criteria (OWE)/Learning outcomes (EVL)	The student: - recognises and describes different production techniques; - points out and explains the correct terms and concepts for different production techniques; - differentiates between different production

	techniques.makes calculations to substantiate technical decisions (e.g. required power); - chooses an optimal production technique, in relation to an automotive design, material and various business aspects.
Educational activities offered	Not applicable

S4 - VDT - Manufacturing Technology 2

General information OWE / course	
Degree programme	Automotive Engineering
Semester	S4
Course Code (OSIRIS)	MANUTE10
Academic year	2025
Name Course short Dutch	AUM S4 VDT Manufacturing Technology 2
Name Course long Dutch	Manufacturing Technology 2
Name Course short English	AUM S4 VDT Manufacturing Technology 2
Name Course long English	Manufacturing Technology 2
Coordinating unit	AEA
Course type	OWE
Credits	2,5
Degree	B (post propaedeutic bachelor)
Grading scale course grades	Whole (without decimal)
Language of communication	English
Study load in hours	70
Instructional modes	OW (Education)
Starting term education	P4A
Duration of education	Term
Compensation options	Not appicable
Entry requirements course	It's important that the student meet the following guidelines so they can work as required: - Complete the Manufacturing Technology 1 unit of study.
General discription	The unit of study is an extension of the Manufacturing Technology 1 unit of study. In addition to the learning outcomes from that unit of study, you work on a specified case for an automotive product. You choose a suitable production technique and material for that product, create a production drawing, set up a production plan.
Mandatory participation	Workshop Geometrical Tolerances
Examination	
Exam number in OSIRIS	**TOETS-01**
Fulltime/Parttime	Fulltime
Description (Dutch)	Manufacturing Technology 2
Description (English)	Manufacturing Technology 2
Format (modular)exam	PORT Portfolio
Weight factor of (modular) exam	1
Minimum result	5,5
Grading scale	Decimal
Exam sittings	YEARA
Written exam type	Not applicable
Assessment criteria (OWE)/Learning outcomes (EVL)	For a specified product related to a complex automotive design, the student: - explores alternative options that consider design, material & manufacturing aspects. - creates a production drawing. - specifies geometrical tolerances on a production drawing. - creates a production plan. Participation in the workshop on geometrical tolerances is mandatory.

Educational activities offered	Not applicable

S4 - VDT - Modeling the suspension

General information OWE / course	
Degree programme	Automotive Engineering
Semester	S4
Course Code (OSIRIS)	MODTHS03
Academic year	2025
Name Course short Dutch	AUM S4 VDT Modeling the suspension
Name Course long Dutch	Modeling the suspension
Name Course short English	AUM S4 VDT Modeling the suspension
Name Course long English	Modeling the suspension
Coordinating unit	AEA
Course type	OWE
Credits	2,5
Degree	B (post propaedeutic bachelor)
Grading scale course grades	Whole (without decimal)
Language of communication	English
Study load in hours	70
Instructional modes	OW (Education)
Starting term education	P3A
Duration of education	Term
Compensation options	Not applicable
Entry requirements course	Not applicable.
General discription	This unit of study covers the modelling of a vehicle considering the suspension. It addresses the influences of the vehicle suspension system and its components on the vehicle dynamics and road holding.
Mandatory participation	No
Examination	
Exam number in OSIRIS	**TOETS-01**
Fulltime/Parttime	Fulltime
Description (Dutch)	Modeling the suspension
Description (English)	Modeling the suspension
Format (modular)exam	PORT Portfolio
Weight factor of (modular) exam	1
Minimum result	5,5
Grading scale	Decimal
Exam sittings	YEARA
Written exam type	Not applicable
Assessment criteria (OWE)/Learning outcomes (EVL)	The student is able to: - define vertical comfort, loads and road holding of a vehicle; - build a suspension model in a design tool (e.g. Solidworks / Matlab Simulink / Simscape Multibody / Simmechanics) in order to support the analyses in UoS 'Suspension dynamics and road holding'; - build a mathematical suspension model (based on differential equations) focused on the research of the vertical road holding and comfort;perform parameter studies to investigate the dynamic behavior of the suspension with the specified models;

Educational activities offered	Not applicable

S4 - VDT - Suspension dynamics and road holding

General information OWE / course	
Degree programme	Automotive Engineering
Semester	S4
Course Code (OSIRIS)	SUSDYR08
Academic year	2025
Name Course short Dutch	AUM S4 VDT Suspension dynamics
Name Course long Dutch	Suspension dynamics and road holding
Name Course short English	AUM S4 VDT Suspension dynamics
Name Course long English	Suspension dynamics and road holding
Coordinating unit	AEA
Course type	OWE
Credits	2,5
Degree	B (post propaedeutic bachelor)
Grading scale course grades	Whole (without decimal)
Language of communication	English
Study load in hours	70
Instructional modes	OW (Education)
Starting term education	P3A
Duration of education	Term
Compensation options	Not applicable
Entry requirements course	Not applicable.
General discription	This study unit covers the dynamics of a vehicle considering the suspension. The influences of the vehicle suspension system and its components on the vehicle dynamics and road holding are covered, including for example: camber, caster, roll center, over/understeer, stabilizer rod, anti-dive anti-squat. During the module, the student makes an analyses of his own chosen vehicle suspension and supports this with a model.
Mandatory participation	No
Examination	
Exam number in OSIRIS	**TOETS-01**
Fulltime/Parttime	Fulltime
Description (Dutch)	Suspension dynamics and road holding
Description (English)	Suspension dynamics and road holding
Format (modular)exam	PORT Portfolio
Weight factor of (modular) exam	1
Minimum result	5,5
Grading scale	Decimal
Exam sittings	YEARA
Written exam type	Not applicable
Assessment criteria (OWE)/Learning outcomes (EVL)	The student is able to: - determine design aspects of the suspension (e.g. roll center, anti dive/anti squat, roll stiffness) which influences the vehicle

	dynamics (e.g. kinematics and elasto-kinematics, roll/dive/squat) and road holding (e.g. roll steer, over steer/ nder steer) of the vehicle; - analyze how these design aspects influence the vehicle dynamics and road holding of the vehicle; - analyze an existing suspension (e.g. students own vehicle) on the design aspects and relate it to vehicle dynamics and road holding; - support the analyses of an existing suspension with a model of that suspension.
Educational activities offered	Not applicable

S4 - VDT - Testing the vehicle

General information OWE / course	
Degree programme	Automotive Engineering
Semester	S4
Course Code (OSIRIS)	TESTHV03
Academic year	2025
Name Course short Dutch	AUM S4 VDT Testing the vehicle
Name Course long Dutch	Testing the vehicle
Name Course short English	AUM S4 VDT Testing the vehicle
Name Course long English	Testing the vehicle
Coordinating unit	AEA
Course type	OWE
Credits	2,5
Degree	B (post propaedeutic bachelor)
Grading scale course grades	Whole (without decimal)
Language of communication	English
Study load in hours	70
Instructional modes	OW (Education)
Starting term education	P4A
Duration of education	Term
Compensation options	Not applicable
Entry requirements course	Not applicable.
General discription	Assessment of vehicle performance is an important phase in the V-cycle in a vehicle's development process. The specifications are validated with measurements and data analysis. In this unit of study, the student will learn how to judge a vehicle by performing vehicle tests and analysing measured data.
Mandatory participation	No
Examination	
Exam number in OSIRIS	**TOETS-01**
Fulltime/Parttime	Fulltime
Description (Dutch)	Testing the vehicle
Description (English)	Testing the vehicle
Format (modular)exam	PORT Portfolio
Weight factor of (modular) exam	1
Minimum result	5,5
Grading scale	Decimal
Exam sittings	YEARA
Written exam type	Not applicable
Assessment criteria (OWE)/Learning outcomes (EVL)	The student can: - perform a vehicle test in a reproducible way; acquire data with software, choose an appropriate filter for the data and process the data; - analyse the specifications of the vehicle by means of the processed data; - present the results of the analysis; - based on the knowledge and skills gained in this unit of study, the student writes a test report. All the information

	needed for this test report is stored in a portfolio that is graded.
Educational activities offered	Not applicable

S4 - VSC - Challenge autonomous driving

General information OWE / course	
Degree programme	Automotive Engineering
Semester	S4
Course Code (OSIRIS)	CHAAUD03
Academic year	2025
Name Course short Dutch	AUM S4 VSC Challenge autonomous driving
Name Course long Dutch	Challenge autonomous driving
Name Course short English	AUM S4 VSC Challenge autonomous driving
Name Course long English	Challenge autonomous driving
Coordinating unit	AEA
Course type	OWE
Credits	5
Degree	B (post propaedeutic bachelor)
Grading scale course grades	Whole (without decimal)
Language of communication	English
Study load in hours	140
Instructional modes	OW (Education)
Starting term education	P4A
Duration of education	Term
Compensation options	Not applicable
Entry requirements course	Not applicable.
General discription	In this unit of study, you design a self-driven vehicle that can autonomously drive a predefined route, find a free parking spot and park the vehicle in that spot. To do this, you select appropriate sensor systems, write software and carry out a lot of testing. Based on given system specifications, you learn how to build sensor systems, read and process their signals so you can use them to control the system actuators. The educational format used in this unit of study is a challenge.
Mandatory participation	No
Examination	
Exam number in OSIRIS	**TOETS-01**
Fulltime/Parttime	Fulltime
Description (Dutch)	Challenge autonomous driving
Description (English)	Challenge autonomous driving
Format (modular)exam	PROD (Professional) product
Weight factor of (modular) exam	1
Minimum result	5,5
Grading scale	Decimal
Exam sittings	YEARA
Written exam type	Not applicable
Assessment criteria (OWE)/Learning outcomes (EVL)	The student can: - the student can substantiate related choices: develop a properly structured and documented algorithm in a model-based way.

	- design and test sensor electronics for ADAS systems (e.g. object detection and lane-keeping); - design and implement ECU software for ADAS systems; - design, test and validate vehicle models and apply these models in a model-based design process; - write a technical design report.
Educational activities offered	Not applicable

S4 - VSC - Designing Electric Driveline

General information OWE / course	
Degree programme	Automotive Engineering
Semester	S4
Course Code (OSIRIS)	DESTHE04
Academic year	2025
Name Course short Dutch	AUM S4 VSC Designing Electric Driveline
Name Course long Dutch	Designing the Electric Driveline
Name Course short English	AUM S4 VSC Designing Electric Driveline
Name Course long English	Designing the Electric Driveline
Coordinating unit	AEA
Course type	OWE
Credits	2,5
Degree	B (post propaedeutic bachelor)
Grading scale course grades	Whole (without decimal)
Language of communication	English
Study load in hours	70
Instructional modes	OW (Education)
Starting term education	P4A
Duration of education	Term
Compensation options	Not applicable
Entry requirements course	Not applicable.
General discription	HAN Automotive Engineering considers the powertrain system approach from load (energy demand), transition (energy conversion) and (energy) source. The unit of study Designing the Electric Driveline focuses on the powertrains for electric (EV) and hybrid (HEV) vehicles. In this unit of study the student learns to design the driveline for EV and HEV, from system level to basic machine design, and to test, model and control specific system parameters.
Mandatory participation	No
Examination	
Exam number in OSIRIS	**TOETS-01**
Fulltime/Parttime	Fulltime
Description (Dutch)	Understanding
Description (English)	Understanding
Format (modular)exam	KENN Knowledge exam
Weight factor of (modular) exam	1
Minimum result	5,5
Grading scale	Decimal
Exam sittings	P4A (1x) P5A (1x)
Written exam type	ANS BOYD
Assessment criteria (OWE)/Learning outcomes (EVL)	With regard to different electric and hybrid vehicles, the student can: - research systems - define a set of requirements - select architecture and design driveline systems and

	components, in line with the design philosophy and feasibility.
Educational activities offered	Not applicable
Exam number in OSIRIS	**TOETS-02**
Fulltime/Parttime	Fulltime
Description (Dutch)	Research and Model
Description (English)	Research and Model
Format (modular)exam	PROD (Professional) product
Weight factor of (modular) exam	0
Minimum result	P
Grading scale	P/F
Exam sittings	YEARA
Written exam type	Not applicable
Assessment criteria (OWE)/Learning outcomes (EVL)	With regard to different electric and hybrid vehicles, the student is can: - build a torque controlled driveline model; - perform a laboratory test to collect data; - tune the model with the aquired data; - perform parameter studies with the tuned model.
Educational activities offered	Not applicable

S4 - VSC - Introduction to ECUs and Model-Based Development

General information OWE / course	
Degree programme	Automotive Engineering
Semester	S4
Course Code (OSIRIS)	INEMOB03
Academic year	2025
Name Course short Dutch	AUM4-VSC-MBD
Name Course long Dutch	Introduction to ECUs and Model-Based Development
Name Course short English	AUM4-VSC-MBD
Name Course long English	Introduction to ECUs and Model-Based Development
Coordinating unit	AEA
Course type	OWE
Credits	5
Degree	B (post propaedeutic bachelor)
Grading scale course grades	Whole (without decimal)
Language of communication	English
Study load in hours	140
Instructional modes	OW (Education)
Starting term education	P3A
Duration of education	Term
Compensation options	Not applicable
Entry requirements course	Not applicable.
General discription	This unit of study explains how MCU's and ECU's work and how to write control software via model-based design. Electronic control units (ECU's) form the heart of all automotive systems. ECU's are control units that use sensors to measure physical data like temperature and pressure. Based on these sensors readings, ECU's control systems in the vehicle. An example is an ABS system that controls brake pressure to prevent wheel slip based on wheel speed sensors. This course explains the hardware of an ECU, among which the MCU (microcontroller unit), several sensor systems and power electronics. Software algorithms need to be developed to control the vehicle systems. You learn to use simulation techniques to do this in a model-based way, as it is done by vehicle manufacturers. Programming in this unit of study uses a graphical environment, based on MATLAB/Simulink®. You learn how to program an MCU board with Matlab/Simulink, how to visualise signals via e.g. HANtune and how model-based design can be used to simplify and test the design. On completion of the unit of study, you can structure the model, document it and maintain it using a version control system.
Mandatory participation	No
Examination	
Exam number in OSIRIS	**TOETS-01**

Fulltime/Parttime	Fulltime
Description (Dutch)	Basics of ECU and Model-Based Development
Description (English)	Basics of ECU and Model-Based Development
Format (modular)exam	KENN Knowledge exam
Weight factor of (modular) exam	1
Minimum result	5,5
Grading scale	Decimal
Exam sittings	P3A (1x) P4A (1x)
Written exam type	ANS Written
Assessment criteria (OWE)/Learning outcomes (EVL)	The student can: - make a global functional sketch of the architecture of an ECU; - explain the working of an MCU and its main features (processor, memory, timers, ADC); - explain and/or work out basic Simulink models or subsystems to implement control algorithms or to process sensor signals. - manage and maintain the source code and documentation in a version control system; - explain the most relevant model-based control system development techniques, including their advantages and disadvantages.
Educational activities offered	Not applicable
Exam number in OSIRIS	**TOETS-02**
Fulltime/Parttime	Fulltime
Description (Dutch)	Workshops ECU
Description (English)	Workshops ECU
Format (modular)exam	PROD (Professional) product
Weight factor of (modular) exam	0
Minimum result	P
Grading scale	P/F
Exam sittings	YEARA
Written exam type	Not applicable
Assessment criteria (OWE)/Learning outcomes (EVL)	The student can: - understand and write basic matlab scripts and simulink models. - measure the main characteristics of the ADC of an ECU (offset, reference voltage, accuracy); - design a simple (thermal) sensor system using the ADC of a microcontroller system; - create PWM signals with adjustable frequency and duty cycle; - use the input capture feature of a timer to measure the number of pulses and frequency of a signal; - implement control algorithms in the simulation model and/or real-time application; - create practically working subsystems by automatically generating code from the simulation model (‘RCP’: Rapid Control Prototyping) and running it on the physical prototype system (‘HIL”: Hardware-In-the-Loop);

	- validate the design and the resulting system behaviour based on given system specifications.
Educational activities offered	Not applicable

S4 - VSC - Model and Control the Powertrain

General information OWE / course	
Degree programme	Automotive Engineering
Semester	S4
Course Code (OSIRIS)	VSCMCP01
Academic year	2025
Name Course short Dutch	AUM S4 VSC Model and Control
Name Course long Dutch	Model and Control the Powertrain
Name Course short English	AUM S4 VSC Model and Control
Name Course long English	Model and Control the Powertrain
Coordinating unit	AEA
Course type	OWE
Credits	2,5
Degree	B (post propaedeutic bachelor)
Grading scale course grades	Whole (without decimal)
Language of communication	English
Study load in hours	70
Instructional modes	OW (Education)
Starting term education	P4A
Duration of education	Term
Compensation options	Not applicable
Entry requirements course	This module builds on the Semester 4 VSC specialization. Students are assumed to have the knowledge and skills from this specialization.
General discription	The Automotive Centre of Expertise at HAN considers the powertrain system approach from load (energy demand), transition (energy conversion) and (energy) source. The Model and Control the Powertrain unit of study focuses on the dynamic behaviour of powertrain systems, for example for internal combustion engine and driveline, battery cooling and hydrogen systems and/or components. In this unit of study, you learn: - How to optimise (with regard to sizing) the major components in a (hybrid) driveline configuration; - A method for modelling the energy flow through the major parts of a hybrid driveline. The unit of study consists of classes, combined with an assignment. Matlab/Simulink will be used.
Mandatory participation	No
Examination	
Exam number in OSIRIS	**TOETS-01**
Fulltime/Parttime	Fulltime
Description (Dutch)	Model and control the powertrain
Description (English)	Model and control the powertrain
Format (modular)exam	PROD (Professional) product
Weight factor of (modular) exam	1
Minimum result	5,5
Grading scale	Decimal
Exam sittings	YEARA

Written exam type	Not applicable
Assessment criteria (OWE)/Learning outcomes (EVL)	- Capability of using models and interpreting the results.
Educational activities offered	Not applicable

S4 - VSC - Testing and Monitoring the Powertrain

General information OWE / course	
Degree programme	Automotive Engineering
Semester	S4
Course Code (OSIRIS)	VSCTMP01
Academic year	2025
Name Course short Dutch	AUM S4 VSC Testing and Monitoring
Name Course long Dutch	Testing and Monitoring the Powertrain
Name Course short English	AUM S4 VSC Testing and Monitoring
Name Course long English	Testing and Monitoring the Powertrain
Coordinating unit	AEA
Course type	OWE
Credits	2,5
Degree	B (post propaedeutic bachelor)
Grading scale course grades	Whole (without decimal)
Language of communication	English
Study load in hours	70
Instructional modes	OW (Education)
Starting term education	P4A
Duration of education	Term
Compensation options	Not appicable
Entry requirements course	Not applicable.
General discription	The Automotive Centre of Expertise at HAN considers the powertrain system approach from load (energy demand), transition (energy conversion) and (energy) source. The unit of study Testing and Monitoring the Powertrain focuses on the dynamic behaviour of the powertrain. In this unit of study, you learn: - How to test (sub)systems - How to interpret test results In this unit of study, you learn the basics of testing a powertrain. The assignment is about engine mapping and settings and includes: - Measuring a set of parameters of a powertrain. - Selecting possible sensors - Collecting data (sampling frequencies, filtering and data-manipulation etc.). - Dealing with repeatability, accuracy, plausibility, etc. - Concluding on the outcome of a test.Matlab/Simulink will be used. The unit of study consists of classes, combined with a practical workshop.
Mandatory participation	No
Examination	
Exam number in OSIRIS	**TOETS-01**
Fulltime/Parttime	Fulltime
Description (Dutch)	Testing and monitoring the powertrain
Description (English)	Testing and monitoring the powertrain
Format (modular)exam	PROD (Professional) product
Weight factor of (modular) exam	1

Minimum result	5,5
Grading scale	Decimal
Exam sittings	YEARA
Written exam type	Not applicable
Assessment criteria (OWE)/Learning outcomes (EVL)	The group will be assessed based on a test report. This test report should consist of the following minimal parts: - introduction (measurement goal, approach, test setup); - a justification of the sensors, measurement equipment and software used; - a justification of the measurement set-up (frequencies, filtering); - check of functionality, plausibility and control of the measured system; - test results and the analysis of the measurements; - a clear conclusion on the outcome; - recommendations. -Presenting and or discussing results.
Educational activities offered	Not applicable

S4 - VSC - Vehicle Dynamics (VD)

General information OWE / course	
Degree programme	Automotive Engineering
Semester	S4
Course Code (OSIRIS)	VSCVED01
Academic year	2025
Name Course short Dutch	AUM S4 VSC Vehicle Dynamics
Name Course long Dutch	Vehicle Dynamics (VD)
Name Course short English	AUM S4 VSC Vehicle Dynamics
Name Course long English	Vehicle Dynamics (VD)
Coordinating unit	AEA
Course type	OWE
Credits	2,5
Degree	B (post propaedeutic bachelor)
Grading scale course grades	Whole (without decimal)
Language of communication	English
Study load in hours	70
Instructional modes	OW (Education)
Starting term education	P3A
Duration of education	Term
Compensation options	Not appicable
Entry requirements course	Not applicable.
General discription	This unit of study covers the dynamics of a vehicle, with a focus on the lateral dynamics, like handling and cornering. However, as these are strongly coupled with the longitudinal (accelerating and braking) and vertical (road holding) dynamics, these influences will also be considered. As the tire plays a major role in vehicle dynamics, special focus is also paid to tire behaviour. General, widely-used models in research and industry for tires and vehicles are used in theory and in modelling and simulation. Guest lectures about for example race car dynamics, motorcycle behaviour, autonomous driving expand the scope of this unit of study to related automotive fields. A test day on the circuit is optional for students to experience handling testing themselves.
Mandatory participation	No
Examination	
Exam number in OSIRIS	**TOETS-01**
Fulltime/Parttime	Fulltime
Description (Dutch)	Vehicle Dynamics
Description (English)	Vehicle Dynamics
Format (modular)exam	KENN Knowledge exam
Weight factor of (modular) exam	1
Minimum result	5,5
Grading scale	Decimal
Exam sittings	P3A (1x) P4A (1x)
Written exam type	Written

Assessment criteria (OWE)/Learning outcomes (EVL)	The student can: - Analyse and explain the lateral dynamics of a vehicle including the main influences of longitudinal and vertical dynamics by performing calculations and analysis, use models, draw conclusions and translate (model) results to real life. - Warm up tests before or at the start of a lecture and a written exam in the end.
Educational activities offered	Not applicable