S7 - Minor Powertrain part 1 - assessment

General information OWE / course	
Degree programme	Automotive Engineering
Semester	S7
Course Code (OSIRIS)	MINPOW01
Academic year	2025
Name Course short Dutch	Powertrain deel 1
Name Course long Dutch	Minor Powertrain deel 1 - assessment
Name Course short English	Powertrain part 1
Name Course long English	Minor Powertrain part 1 - assessment
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
Starting term education	P1A
Duration of education	Semester
Compensation options	None
Entry requirements course	Students of HAN Automotive need permission from the study guide to enroll in the minor Powertrain. Students of other UAS need permission from the minor coordinator Powertrain to enroll in the minor Powertrain.
General discription	The central professional task is to design a mobile powertrain. In small groups students carry out projects from the industry. Lectures, practicals and assignments are given in the areas of design and powertrain. Examination will take place by a portfolio followed by a seperate performance assessment and exams on supporting theory
Mandatory participation	No
Examination	
Exam number in OSIRIS	**TOETS-01**
Fulltime/Parttime	Fulltime
Description (Dutch)	Performance Assessment
Description (English)	Performance Assessment
Format (modular)exam	PERF Performance
Weight factor of (modular) exam	1
Minimum result	5,5
Grading scale	Whole
Exam sittings	YEARA
Written exam type	NOT APPLICABLE
Assessment criteria (OWE)/Learning outcomes (EVL)	The student can: • analyse customer demands; • draft a set of requirements; • model the load cycle;

	• analyse power flows; • design a drive line, distinguishing between major and minor issues; • dimension mechanical parts; • calculate driveline efficiencies; • concisely report on the design; • defend and improve the design in a setting of a conversation between fellow engineers; • contribute to the thinking process with those fellow engineers.
Educational activities offered	Not applicable
Exam number in OSIRIS	**TOETS-02**
Fulltime/Parttime	Fulltime
Description (Dutch)	Project
Description (English)	Project
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: - shows investigative- and reflective attitude towards project, client and result in a complex, uncertain working environment. - shows effective collaboration with team members and the client (or other stakeholders) - shows professional communication of own and team results to the outside world. - applies in a conscious matter a method of project management and planning (e.g., agile skills) which results in a tracible and flexible project planning leading to involvement of all relevant stakeholders. - acts at the level of junior Engineer, capable of choosing an appropriate research- and/or design methodology, resulting in a contribution to the end-result of a complex project. At the end of the project, the student must deliver the relevant professional products and participate in the presentation about the project. Personal reflection and peer feedback on the performance are required for personal competence development.
Educational activities offered	Not applicable

S7 - Minor Powertrain part 2 - Theory

General information OWE / course	
Degree programme	Automotive Engineering
Semester	S7
Course Code (OSIRIS)	MINPOW02
Academic year	2025
Name Course short Dutch	Powertrain deel 2
Name Course long Dutch	Minor Powertrain deel 2 - Theorie
Name Course short English	Powertrain part 2
Name Course long English	Minor Powertrain part 2 - Theory
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
Starting term education	P1A
Duration of education	Semester
Compensation options	1 (one) minimum of 4.5 can be compensated with one other exam (5.5 or higher) from this OWE. The numerical average will be applied to both marks. (i.e. 4.5+6.5 = 11 --> 5.5 and 5.5 for both)
Entry requirements course	This minor Powertrain builds further on knowledge and skills from certain subjects areas. For students of HAN Automotive the study guide is consulted; for students of other UAS the minor coordinator Powertrain is consulted.
General discription	Dit deel omvat de theorie en bijbehorende tentamens van de Minor Powertrain.
Mandatory participation	No
Examination	
Exam number in OSIRIS	**TOETS-01**
Fulltime/Parttime	Fulltime
Description (Dutch)	Thema toets 1
Description (English)	Thematic exam 1
Format (modular)exam	KENN Knowledge exam
Weight factor of (modular) exam	1
Minimum result	5,5
Grading scale	Decimal
Exam sittings	YEARA
Written exam type	ANS written
Assessment criteria (OWE)/Learning outcomes (EVL)	You are able to properly recognize the load case and are able to establish the relevant and significant parameters that will define the driveline. Where applicable according to the contemporary technological status-quo. • You possess knowledge of driveline topology and are able to make the correct judgment and corresponding decisions in regard to performance (in broad sense) based on provided boundary conditions that draw from ‘real life’ cases.

	• You are able to, based on a provided topology, establish the specifications of the individual components (sizing) taking into account the applicable boundary conditions (i.e. cost, sustainability). You know how to apply the relevant legislation (i.e. weight, fuel volume, emissions). • You are able to, by applying the correct tools, index a predefined driveline on performance (in broad sense). Departing from this indexing you are able to optimize the design to certain predetermined criteria.
Educational activities offered	Not applicable
Exam number in OSIRIS	**TOETS-02**
Fulltime/Parttime	Fulltime
Description (Dutch)	Thema toets 2
Description (English)	Thematic exam 2
Format (modular)exam	KENN Knowledge exam
Weight factor of (modular) exam	1
Minimum result	5,5
Grading scale	Decimal
Exam sittings	YEARA
Written exam type	ANS written
Assessment criteria (OWE)/Learning outcomes (EVL)	You are familiar and proficient with the fundamentals of hydraulics, able to recognize the components and explain their basic functionality within the proper context. • You are able to establish the topology of a hydraulic system. You are able to, based on predetermined load cases, establish the sizing of the relevant components respecting the specifications and limitations provided by the manufacturers. • You are familiar with the limiting factors that are present or emerge within hydraulics systems (i.e. pressure drop, temperature change, flow) • You are able to optimize, on a higher abstraction level, a hydraulic system targeting at least one demand/benchmark. (e.g. 'smart hydraulics')
Educational activities offered	Not applicable
Exam number in OSIRIS	**TOETS-03**
Fulltime/Parttime	Fulltime
Description (Dutch)	Thema toets 3
Description (English)	Thematic exam 3
Format (modular)exam	KENN Knowledge exam
Weight factor of (modular) exam	1
Minimum result	5,5
Grading scale	Decimal
Exam sittings	YEARA
Written exam type	ANS written
Assessment criteria (OWE)/Learning outcomes (EVL)	You are able to demonstrate fundamental knowledge and skill regarding rotating and translating dynamics and are able to apply this on (simplified) cases. • You possess knowledge about vibrational analysis and can establish natural frequencies of simple cases. You are familiar with FFT and know how to apply this on existing

	research results/measurements. • You possess knowledge about the 'crank-slider' mechanism (e.g. reciprocating piston engines) and the corresponding dynamics involved. • You are able to select, using motor specifications, an electrical machine for a given load cycle. • You know how heat management is applied on electric drives and are familiar with the principles of power electronics and their corresponding (energetic) losses.
Educational activities offered	Not applicable
Exam number in OSIRIS	**TOETS-04**
Fulltime/Parttime	Fulltime
Description (Dutch)	Thema toets 4
Description (English)	Thematic exam 4
Format (modular)exam	KENN Knowledge exam
Weight factor of (modular) exam	1
Minimum result	5,5
Grading scale	Decimal
Exam sittings	YEARA
Written exam type	ANS written
Assessment criteria (OWE)/Learning outcomes (EVL)	You are able to size and select batteries for given load cycles and conditions and are aware of the safety regulations around (HV) batteries in general • You understand the working principles of Supercaps and Fuelcells and are able to execute elementary calculations regarding their performance (in broad sense). • You understand DC-DC conversion and are able to identify the control parameters involved for successful implementation in an automotive driveline. • You are familiar with the design and implementation of e-machine control regarding torque, speed and position. • You understand DC, BLDC, BLAC motors in both working principles and their associated control. You possess knowledge about FOC (Field Oriented Control) on a PMSM You are familiar with the axial and radial flux topology as well as inner- and outer rotor designs of a PMSM.
Educational activities offered	Not applicable

S7 - Minor Powertrain part 3 - Portfolio

General information OWE / course	
Degree programme	Automotive Engineering
Semester	S7
Course Code (OSIRIS)	MINPOW03
Academic year	2025
Name Course short Dutch	Powertrain deel 3
Name Course long Dutch	Minor Powertrain deel 3 - Portfolio
Name Course short English	Powertrain part 3
Name Course long English	Minor Powertrain part 3 - Portfolio
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
Starting term education	P1A
Duration of education	Semester
Compensation options	No
Entry requirements course	This minor Powertrain builds further on knowledge and skills from certain subjects areas. For students of HAN Automotive the study guide is consulted; for students of other UAS the minor coordinator Powertrain is consulted.
General discription	The central professional task is to design a mobile powertrain. In small groups students carry out projects from the industry. Lectures, practicals and assignments are given in the areas of design and powertrain. Examination will take place by a portfolio followed by a seperate performance assessment and exams on supporting theory.
Mandatory participation	No
Examination	
Exam number in OSIRIS	**TOETS-01**
Fulltime/Parttime	Fulltime
Description (Dutch)	Portfolio
Description (English)	Portfolio
Format (modular)exam	PORT Portfolio
Weight factor of (modular) exam	1
Credits	10
Minimum result	5,5
Grading scale	Whole
Exam sittings	YEARA
Written exam type	Not applicable

Assessment criteria (OWE)/Learning outcomes (EVL)	In essence the collection of the group assignments CAE (2 pcs) and 2 individual assignments. See the OWE learning outcomes MINPOW03. Based on a Rubric each portfolio component is graded between 4 and 10 out of 10 points. With a minimum of 6 points to pass. The rubric is tailored to the portfolio contents and is communicated/made available to the students at the start of the minor.
Educational activities offered	Not applicable