

S3 - Electronics Design, Signals and Systems course

General information OWE / course	
Degree programme	Electrical and Electronic Engineering
Semester	S3
Course Code (OSIRIS)	ELEDES09
Academic year	2026
Name Course short Dutch	ELT S3 Electronics Design
Name Course long Dutch	Electronics Design, Signals and Systems course
Name Course short English	ELT S3 Electronics Design
Name Course long English	Electronics Design, Signals and Systems course
Coordinating unit	AEA
Course type	OWE
Credits	15
Degree	B (post propaedeutic bachelor)
Grading scale course grades	Whole (without decimal)
Language of communication	English
Study load in hours	420
Instructional modes	OW (Onderwijs/Education)
Starting term education	P1A
Duration of education	Semester
Compensation options	Not applicable
Entry requirements course	Not applicable
General discription	Theory course in basic knowledge and skills. This unit of study comprises courses and/or labs on electronics and control engineering, thus providing knowledge and skills that are needed to some extent to carry out the control engineering project.
Mandatory participation	No
Examination	
Exam number in OSIRIS	TOETS-01
Fulltime/Parttime	Fulltime
Description (Dutch)	Elektronica 1
Description (English)	Electronics 1
Format (modular)exam	KENN Knowledge exam
Weight factor of (modular) exam	1
Minimum result	5,5
Grading scale	Decimal
Exam sittings	P1A (1x) P2A (1x)
Written exam type	ANS BOYD
Assessment criteria (OWE)/Learning outcomes (EVL)	The student: <ul style="list-style-type: none"> • knows the properties of the different semiconductor switches and can apply and dimension the components in different basic circuits; • can extract the basic switch data from the data sheets; • Knows the basic properties of the opamp and can use it to design an amplifier.
Educational activities offered	Not applicable
Exam number in OSIRIS	TOETS-02
Fulltime/Parttime	Fulltime

Description (Dutch)	Elektronica 2
Description (English)	Electronics 2
Format (modular)exam	KENN Knowledge exam
Weight factor of (modular) exam	1
Minimum result	5,5
Grading scale	Decimal
Exam sittings	P2A (1x) P3A (1x)
Written exam type	ANS BYOD
Assessment criteria (OWE)/Learning outcomes (EVL)	<p>The student:</p> <ul style="list-style-type: none"> • is familiar with various amplifier circuits that can be made with an opamp; • can dimension the components around the opamp so that the circuit meets the given specifications; • can design first and higher order filters using opamp circuits; • knows the differences between Butterworth, Chebyshev and Bessel filters and knows when to use which filter; • can design linear and switching power supplies using data sheets; • can describe the functioning of a harmonic oscillator and calculate the oscillation frequency and minimum gain.
Educational activities offered	Not applicable
Exam number in OSIRIS	TOETS-03
Fulltime/Parttime	Fulltime
Description (Dutch)	Practicum Elektronica
Description (English)	Electronics Lab
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)	<p>The student:</p> <ul style="list-style-type: none"> • applies knowledge of ELC1 and ELC2 to the realisation of practical circuits; • can correctly implement diagrams that are linked to the theory of ELC; • can make a correct assessment of the measured result; • can connect the circuit in the correct manner; • can measure correctly and record the measurements in a report; • validates the measured results using the expected values and draws the right conclusions within this context.
Educational activities offered	Not applicable
Exam number in OSIRIS	TOETS-04
Fulltime/Parttime	Fulltime
Description (Dutch)	Systeembeschrijvingen
Description (English)	System Descriptions
Format (modular)exam	KENN Knowledge exam
Weight factor of (modular) exam	1

Minimum result	5,5
Grading scale	Decimal
Exam sittings	P1A (1x) P2A (1x)
Written exam type	Written
Assessment criteria (OWE)/Learning outcomes (EVL)	<p>The student:</p> <ul style="list-style-type: none"> • analyses a physical system in the electrical, mechanical and/or process-technological domains. You have made a system structure diagram for the analysis of which a white-box model has been set up via the structured definition of differential equations. • is able to transform this differential equation to the frequency domain into a transfer function. • has realised a simulation diagram of this model with which you have performed relevant experiments to investigate system behaviour. You have made the correctness of the model plausible by considering the simulation results.
Educational activities offered	Not applicable
Exam number in OSIRIS	TOETS-05
Fulltime/Parttime	Fulltime
Description (Dutch)	Regeltechniek
Description (English)	Control Systems
Format (modular)exam	KENN Knowledge exam
Weight factor of (modular) exam	1
Minimum result	5,5
Grading scale	Decimal
Exam sittings	P2A (1x) P3A (1x)
Written exam type	Written
Assessment criteria (OWE)/Learning outcomes (EVL)	<p>The student:</p> <ul style="list-style-type: none"> • describes the distinction between drive and control and can draw up a block diagram for a control and, if required, simplify it. • describes the effect of feedback control and provide the structure of a control circuit. • sets the feedback control in such a way that the set system specifications such as phase and gain margin and/or static error, overshoot and settling time are met. • is capable in using design and simulation tools for designing and tuning controllers and making plausible that this controller functions according to the specifications.
Educational activities offered	Not applicable
Exam number in OSIRIS	TOETS-06
Fulltime/Parttime	Fulltime
Description (Dutch)	Datacommunicatie 1
Description (English)	Data Communication 1
Format (modular)exam	KENN Knowledge exam
Weight factor of (modular) exam	1
Minimum result	5,5
Grading scale	Decimal

Exam sittings	P1A (1x) P2A (1x)
Written exam type	Written
Assessment criteria (OWE)/Learning outcomes (EVL)	The student: <ul style="list-style-type: none"> • Describes media, modulation methods and protocols of the physical tier. • Describes the consequences of noise and bandwidth restriction. • Relates the bit error rate to message size and efficient use of the connection. • Knows various methods of data transport (synchronous and asynchronous) and the different ways of coding. • Knows the methods of error detection, error correction and data compression.
Educational activities offered	Not applicable
Exam number in OSIRIS	TOETS-07
Fulltime/Parttime	Fulltime
Description (Dutch)	Datacommunicatie 2
Description (English)	Data Communication 2
Format (modular)exam	KENN Knowledge exam
Weight factor of (modular) exam	1
Minimum result	5,5
Grading scale	Decimal
Exam sittings	P2A (1x) P3A (1x)
Written exam type	Written
Assessment criteria (OWE)/Learning outcomes (EVL)	The student: <ul style="list-style-type: none"> • Describes the most important standardised WAN or LAN protocols of the data link tier. • Describes the network tier with the related problems with regard to routing, segmenting/ reassembling and congestion control. • Describes the transmission tier protocols TCP and UDP and knows when connection oriented and connectionless connections are used.
Educational activities offered	Not applicable
Exam number in OSIRIS	TOETS-08
Fulltime/Parttime	Fulltime
Description (Dutch)	Datacommunicatie Lab
Description (English)	Data Communication Lab
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: <ul style="list-style-type: none"> • Analyses error situation with regard to data transmission. • Gives an indication of the cause of data communication problems. • Analyses a data communication protocol when use is made

	<p>of error detection and correction and data compression.</p> <ul style="list-style-type: none"> • Gives a calculation of the transmission time of a quantity of data and measures the real time. • Investigates which addresses are used for a specific TCP/IP connection. • Investigates which tiers play a part in relation to a TCP/IP connection. • Determines how the routing works in relation to a TCP/IP connection. • Analyses setting up a connection-oriented connection in relation to TCP/IP. • Reports on the application of a TCP/IP stack on an embedded system. • Indicates in which way a performance improvement is possible for a specific system.
Educational activities offered	Not applicable

S3 - Project 3: Control Systems for Industrial and Power Systems

General information OWE / course	
Degree programme	Electrical and Electronic Engineering
Semester	S3
Course Code (OSIRIS)	PROIAA41
Academic year	2026
Name Course short Dutch	ELT S3 Project 3
Name Course long Dutch	Project 3: Industrial and Power Systems Regeltechniek
Name Course short English	ELT S3 Project 3
Name Course long English	Project 3: Control Systems for Industrial and Power Systems
Coordinating unit	AEA
Course type	OWE
Credits	15
Degree	B (post propaedeutic bachelor)
Grading scale course grades	Whole (without decimal)
Language of communication	English
Study load in hours	420
Instructional modes	OW (Onderwijs/Education)
Starting term education	P1A
Duration of education	Semester
Compensation options	Not applicable
Entry requirements course	Not applicable.
General discription	Project. The students work on designing and/or building a product or prototype and thereby develop professional and practical skills. The project can be carried out in a mono-disciplinary, bi-disciplinary or multidisciplinary way, either at HAN or on location. The project involves designing a system in which control engineering and electronics are essential elements.
Mandatory participation	No
Examination	
Exam number in OSIRIS	TOETS-01
Fulltime/Parttime	Fulltime
Description (Dutch)	Project 3
Description (English)	Project 3
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)	<ul style="list-style-type: none"> • Students are able to carry out a project with students from another degree course. • Students possess the basic skills in (written) communication, consultation, reflection and cooperation. • Student designs, improves, measures and/or realises a product in which measurement and control technology, communication systems and/or interface electronics are used. • Describes the (technical) results belonging to the phases

	<p>within the V model (Action plan, User/Functional/Technical Requirements, High- Level/Detail design, Realisation, Tests).</p> <ul style="list-style-type: none"> • The student actively applies themselves to the task of achieving the project objectives.
Educational activities offered	Not applicable
Exam number in OSIRIS	TOETS-02
Fulltime/Parttime	Fulltime
Description (Dutch)	Professional Skills 3
Description (English)	Professional Skills 3
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)	<p>The student:</p> <ul style="list-style-type: none"> • Uses an efficient writing plan to write a clearly structured text (e.g. an action plan, memo and/or summary) that is attuned to the reader in terms of both content and language. • Gives a structured individual presentation about a critical choice in the project and underpins that choice with convincing arguments. • Thinks critically about the project and about own performance (type 2 thinking). • Answers critical questions clearly.produces level 2 project activities in meeting, presentation, collaboration and reflection. • Reflects on own learning goals.
Educational activities offered	Not applicable